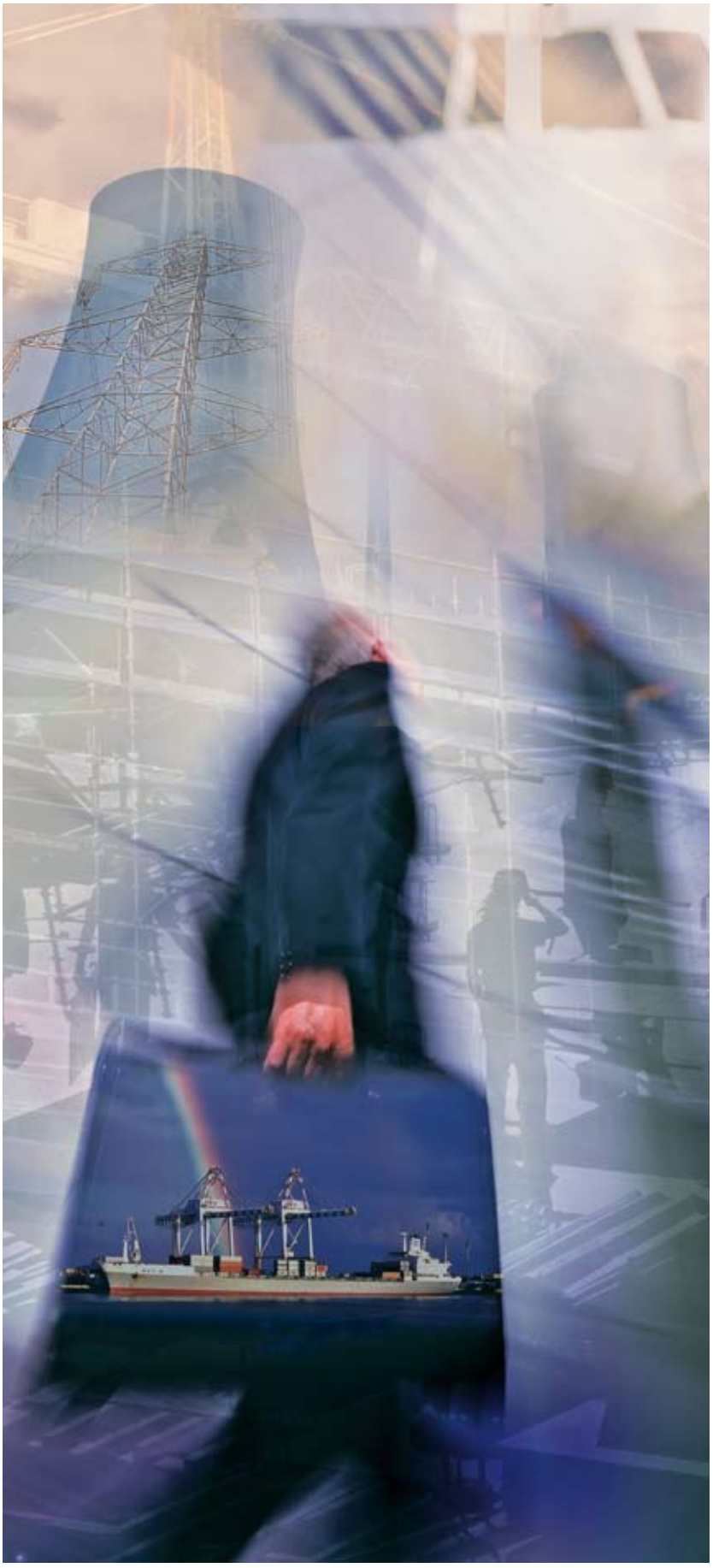

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AN EMPIRICAL ANALYSIS OF SUSTAINABILITY OF TRADE DEFICIT: EVIDENCE FROM SOUTH ASIAN COUNTRIES

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ABSTRACT

In this paper, the long-run relationship between exports and imports of five south Asian countries is examined. We explore this issue using the bounds-testing approach to cointegration. The results failed to support the existence of a long-run equilibrium relationship between exports and imports in Bangladesh India and Sri Lanka; while for Pakistan, the results are inconclusive. Only in Nepal's case, cointegration between exports and imports is detected. These findings question the effectiveness of these countries current long-term macroeconomic policies and suggest these south Asian countries are in violation of its international budget constraint.

Keywords: Trade Deficit, Exports, Imports, Unit root, Structural Breaks, Cointegration

JEL Classifications: C12, C22, F14, F32

1. Introduction

The existence of the long-run equilibrium relationship between exports and imports has been empirically tested by many researchers. These include Arize (2002); Bahmani-Oskooee (1994); Bahmani-Oskooee and Rhee (1997); Herzer and Felcitas (2006); Irandoust and Ericsson (2004); and Narayan and Narayan (2005). A long-run equilibrium relationship between exports and imports implies that trade deficits are only a short-term phenomena and thus sustainable in the long-run. As the macroeconomic policies have been effective in bringing exports and imports into a long-run equilibrium, it can be said that countries are not in violation of their international budget constraint. The objective of this study is to investigate whether a long-run equilibrium relationship exists between exports and imports in of five South Asian countries of Bangladesh, India, Nepal, Pakistan and Sri Lanka. These countries are not only the core countries in the south Asian region but are also are an interesting case in three respects; firstly these countries common aspects such as frequent changes in governments, internal conflicts and numerous wars with each other; secondly, these countries embarked on trade liberalisation at different stages[1], with some sooner than later; lastly these five countries share their borders with each other. Given this, it becomes important to study these countries together. The approach adopted in the paper is different to previous studies in two ways; firstly, we use annual data rather than quarterly data; and secondly we use recently developed bounds testing approach to cointegration, which has many advantages over other methods. The rest of the paper is organised as follows. In the next section of this paper we provide a brief note on the behaviour of exports and imports in all the five South Asian countries. This will be followed by the theoretical rationale for investigating the long-run relationship between exports and imports in section 3. Section four gives discusses the recent literature on the topic. Following this, we explain the econometric

[1] In general, these countries were highly protectionist countries until Sri Lanka started its trade liberalization programme in 1977. In addition to Sri Lanka's early breakthrough, the 1980s witnessed limited reforms in other countries in the region driven particularly by the IMF and World Bank-sponsored structural adjustment programmes, which accelerated and gathered momentum in the 1990s. Sri Lanka was the first to introduce economic reform in 1978 as a result of continuous economic stagnation over the decades. India introduced economic reforms as a result of balance of payments crisis in 1991. Pakistan's economic reforms were in the form of reduction of import tariff over the years starting in late 1980's. Nepal started its economic reforms in the form of removing restrictions and tariffs in 1993. Bangladesh started economic reforms in mid 1980s as a part structural reforms program.

methodology and discussion on the empirical results, in section 5, and our conclusions are presented in the final section.

2. Trends in Exports and Imports in South Asian Countries

Following independence in the late 1940s, the major South Asian countries adopted some of the most inward-oriented trade policy regimes in the world for nearly four decades. These policy regimes included high tariffs and numerous types of non-tariff barriers. The graphs in the appendix show that in all countries, imports have always exceeded exports with a greater divergence between the two for Bangladesh and Nepal. In this section, we provide a brief note on the behaviour of exports and imports in all the five South Asian countries.

The liberalisation process in Bangladesh began in 1980s and continued throughout 1990[2]. The immediate response to liberalisation was reflected in two ways: growth rate and structure of exports and imports. During the pre-liberalization era of 1974-1982, total exports grew at a rate of 1 per cent in contrast to 9 per cent during the post liberalization period. A similar pattern emerges for manufacturing exports. However, manufacturing exports, led by textiles and readymade garments especially since the mid-1980s, grew at rates much faster than total exports in each period. Consequently, there has been a structural change in the composition of total exports in favour of manufacturing exports particularly textiles and readymade garments. The share of manufacturing exports in total exports rose from about 17 per cent in 1975 to 91 per cent in 2006. Textiles and readymade garment exports also show a similar pattern. Their combined share in total exports rose from 13 per cent in 1975 to 80 per cent in 2006.

The liberalisation process in India was forced by Balance of Payments crisis in 1991. India's trade policy prior to the 1991 reforms was characterized by high tariffs and import restrictions. Foreign-manufactured consumer goods were entirely banned, and capital goods, raw materials, and intermediate goods for which domestic substitutes existed were importable only through a bureaucratic licensing process. As a result of liberalisation, exports and imports grew at on average 15% over the years. The share of

[2] For a review of liberalization process in Bangladesh and changes of exports and imports structure, see Hossain and Alauddin(2005).

manufacturing exports in total exports accounted for 65 per cent in 2007. The major exports of India are garments, textiles, leather goods, gems and jewelry, engineering goods and chemicals. Fuel and Energy accounted for 30 per cent of Indian imports in 2007.

Sri Lanka was the first to introduce economic reform in 1978 as a result of continuous economic stagnation over the decades. In early period of 1950s and 1960s, nearly 90 per cent of exports of Sri Lanka consisted of tea, rubber and coconut while rice accounted for 25 per cent of imports. Prior to 1977, the government attempted to control imports simply by adding more restrictions in nature of permit and licenses. Permission to import was granted to specific agencies and ceilings were placed on goods that can be imported. In addition to tariff restrictions, restrictions on foreign exchange transactions also played a roll in limiting imports. The period 1977 onwards can be classified as a more liberal period when all restrictions on trade and transactions were abolished. During the period, imports continued to grow at a faster rate than exports, and trade balance was always in deficit. However, the composition of exports has shifted to industrial exports reducing the dependence of traditional exports of tea, rubber and coconut.

Pakistan's policy reforms have been somewhat different from other countries in the region. Although it initiated a series of liberalization measures between 1972-76, these were abandoned after 1976, and it started to move towards a more liberalized trade regime again in the 1980s (Bandara and Smith, 2002). After 1988, Pakistan managed to reduce the tariffs and non-tariff barriers gradually: the maximum tariff rate which was as high as 250-300 percent has been brought down to 25 percent while the average tariff rate is about 9 percent; and non-tariff barriers have been eliminated and the culture of providing selective concessions, exemptions and privileges to individual firms has given way to an across-the-board uniform rules and regulations. The breaking down of these artificial barriers has led to increase in manufactured exports, led by textiles and readymade garments, now account for 90 percent of the total exports.

Nepal economic reforms was stared in 1992 and those reforms includes elimination of quantitative restrictions on imports and general reduction of tariff rates. Traditionally, Nepal's foreign trade was limited to Tibet and India. The trade to India is conducted under the treaty signed in 1996 and 2002. Under the renewal of the bilateral

trade treaty with India, Nepali goods entered India essentially duty free and quota free. As a result, exports to India grew for four years, from 1997 to 2006, at an average rate of 42% a year. The major export destinations were India (48%), the United States (26%), and Germany (11%). The main exports consist of apparel and woolen carpets. Leading imports were gold, machinery and equipment, petroleum products, and fertilizer.

3. Theoretical Foundations

In this study, the aim is to examine whether the current account of the five south Asian countries is sustainable or not. To achieve this aim, it is necessary to determine whether there is a cointegration relationship between imports and exports or not. For this intend, the method developed by Husted (1992) is used in this study. Husted (1992) provides a testable model for a small open economy which has the key features of absence of government; ability to produce and export a composite good; with consumers having access to international funds implying a long-run relationship between exports and imports.

Husted starts with the individual current period budget constraint as follows:

$$C_0 = Y_0 + B_0 - I_0 - (1+r)B_{-1} \qquad (1)$$

where C_0, Y_0, B_0, I_0 and r are the current consumption, output, international borrowing, investment, and a one period interest rate, respectively; and $(1+r)B_{-1}$ is the initial debt size.

Husted makes several assumptions in deriving the following testable model. One of them is that interest rate is stationary with mean r:

$$X_t = \alpha + \delta M_t + \varepsilon_t \qquad (2)$$

where X_t is the exports of goods and service; and M_t is the imports of goods and services. For the necessary and sufficient condition for the inter-temporal budget constraint of the country to hold, we require that $\delta = 1$ and e_t is stationary. It follows, that expression (2) provides an idealized framework for determining the sustainability of a current account deficit or surplus. In the event this proviso is not met, it would indicate that the economy is not functioning properly and fails to satisfy its budget constraint, and therefore, is expected to default on its debt (Hakkio and Rush, 1991).

The question here pertains to the policy implications of cointegration, or lack of cointegration between imports and exports. The theory suggests that cointegration is to be

expected under the maintained hypothesis that the economy is working properly, and the lack of cointegration leads to breaking international budget constraints.

4. Literature Review

Husted (1992) tests for cointegration between exports and imports in the US plus interest payments abroad from 1960-1989 and finds no evidence of cointegration. However, an analysis of sub samples and with structural break in 1983 supports cointegration. This is consistent with Fountas and Wu (1999) who use quarterly data for the period 1967-1989 and 1967-1994 to test the sustainability of the current account for United States and find that the series are not cointegrated and current accounts are not sustainable.

Apergis *et al*. (2000) test for the sustainability of the Greek current account with annual data for the period 1960-1994. They find that the Greek current account deficit was sustainable. This finding is consistent with Bahmani-Oskooee (1994) who finds evidence of cointegration and concludes that Australian exports and imports will converge in the long-run; and Bahmani-Oskooee and Rhee (1997) who use quarterly data to model exports and imports for Korea. They find evidence of cointegration and also that the coefficient on exports was positive.

Using quarterly data for the period 1973-1998 for 50 OECD and developing countries, Arize (2002) finds that for 35 of the 50 countries, there was evidence of cointegration between exports and imports. He also finds that 31 of the 35 countries had a positive export coefficient. Tang (2003) uses the bounds testing approach to investigate the presence of the relationship between exports and imports for five ASEAN economies[3]. He finds that exports and imports are cointegrated for Malaysia and Singapore only. Narayan and Narayan (2004) find that a long-run relationship exists between exports and imports for Fiji and PNG using the bounds testing approach. On the basis of Johansen's technique, Irandoust and Ericsson (2004) find that there is a cointegration relationship between imports and exports of Germany, Sweden and the USA; but there is no cointegration relationship for the UK. Shiraz and Manap (2005) do not reject the null of no cointegration between exports, imports and real output in Sri

[3] Indonesia, Malaysia, Philippines, Singapore and Thailand.

Lanka. Narayan and Narayan (2005) investigate whether there is a long-run relationship (cointegration) between exports and imports for 22 least developed countries (LDCs) using the bounds testing approach to cointegration. Their results indicate that exports and imports are cointegrated only for six out of the 22 countries[4]. Herzer and Felcitas (2006) conclude that there is long-run equilibrium between exports and imports in Chile. Erbaykal and Karaca (2008) examine whether the foreign deficit of Turkey is sustainable or not using quarterly exports and imports data of 1982:01-2005:04 period. Their result using the Engle-Granger cointegration tests indicate that there is a long period relationship both between nominal exports and imports series and real exports and imports series. Overall, no conclusive evidence regarding long-run relationship between exports and imports emerges from the literature review. The literature review indicates that relationship between exports and imports in the south Asian countries has not been extensively examined. This study aims to fill this gap by examining the long-run relationship between exports and imports in core countries of south Asia, Bangladesh, India, Nepal, Pakistan and Sri Lanka.

5. Estimation

We use annual data for the period from 1960 to 2003 for India, Pakistan and Sri Lanka. The data for Bangladesh is only available from 1972-2003 as its gained independence only in 1971 and Nepal from 1963-2003. The exports and imports data was obtained from the World Bank Tables (2006) and are measured in US dollars. In this study, the bounds testing (Pesaran *et al*. 2001) approach to cointegration is employed to test for the long-run relationship between exports and imports. The bound testing method has numerous advantages over other cointegration techniques. The main advantages of the bounds testing approach to cointegration are outlined below:

∞ Johansen and Juselius and the Engle and Granger approaches to cointegration require all variables to be integrated of order one, 'which introduce a further degree of uncertainty into the analysis of levels relationships' (Pesaran *et al*., 2001). The

[4] These countries include Bangladesh and Nepal. Narayan and Narayan (2005) find no cointegration between exports and imports in the two countries.

bounds testing approach can be applied irrespective of the order of integration, that is whether the regressors are I(0) or I(1).

∞ This technique avoids the pre-testing problems associated with the standard cointegration techniques. The pre-testing procedure in the unit root literature is problematic, as the power of unit root tests are known to be typically low, and there is a switch in the distribution function of the test statistics as one or more roots of the x_t process approaches unity (Pesaran 1997).

∞ Further advantage of the bounds testing procedure is that it is a more statistically significant approach for determining cointegrating relationships in small samples, while the Johansen cointegration technique requires larger samples to be valid (Ghatak and Siddiki 2001). Moreover, the bounds testing procedure is also robust and performs well for small sample sizes (see Tang and Nair 2002).

∞ By using the F-test, the bounds testing procedure to cointegration is able to distinguish which series is the dependent variable when cointegration exists (Narayan and Narayan 2003).

To investigate the existence of a long-run relationship in expression (2), we estimate the following unrestricted error-correction model (UECM):

$$\Delta \ln X_t = \alpha_0 + \sum_{j=1}^{n} b_j \Delta \ln X_{t-j} + \sum_{j=1}^{n} c_j \Delta \ln M_{t-j} + \delta_1 \ln X_{t-1} + \delta_2 \ln M_{t-1} + \varepsilon_{1t} \qquad (3)$$

$$\Delta \ln M_t = \alpha_0 + \sum_{j=1}^{n} b_j \Delta \ln M_{t-j} + \sum_{j=1}^{n} c_j \Delta \ln X_{t-j} + \phi_1 \ln X_{t-1} + \phi_2 \ln X_{t-1} + \varepsilon_{2t} \qquad (4)$$

where Δ is the first difference operator, *ln* X is the log of exports and *ln* M is the log of imports. The F test is used for testing the existence of a long-run relationship between these two variables through testing the significance of the lagged level of variables in the right hand side of UECM. That is, we test the null hypothesis of no cointegrating relation in equation 3, $H_0 : \delta_1 = \delta_2 = 0$ against the alternative $H_0 : \delta_1 = \delta_2 \neq 0$. This is when export is the dependent variable and is written as F(X/M). In equation (4), where import

is the dependent variable (denoted as F(M/X), we test for the null hypothesis of no cointegration $H_0 : \phi_1 = \phi_2 = 0$ against the alternative $H_0 : \phi_1 = \phi_2 \neq 0$

We test these hypotheses using the F-test with critical values tabulated by Pesaran *et al*. (2001). The asymptotic distributions of the F-statistics are non-standard under the null hypothesis of no cointegration relationship between the examined variables, irrespective of whether the variables are purely $I(0)$ or $I(1)$, or mutually cointegrated. Two sets of asymptotic critical values are provided by Pesaran *et al*. (2001). The first set assumes that all variables are $I(0)$ while the second set assumes that all variables are $I(1)$. The null hypothesis of no cointegration will be rejected if the calculated F-statistic is greater than the upper bound critical value. If the computed F-statistics is less than the lower bound critical value, then we cannot reject the null of no cointegration. Finally, the result is inconclusive if the computed F-statistic falls within the lower and upper bound critical values.

Pesaran *et al.* (2001) report the two sets of critical values based on 40,000 replications of a stochastic stimulation, which provide critical value bounds for all classifications of the regressors into purely I(0), purely I(1) or mutually cointegrated for a sample size of 1000 observations. However, this study has small sample sizes ranging from 30 to 45 annual observations. Narayan (2005) computes the critical values for bounds F-test for small samples sizes which is the case in this study. Therefore, we will use Narayan's (2005) critical values.

As there are relatively small sample sizes in this study, the maximum lag length of two was chosen in the ARDL model, a significant F-statistics for testing the joint level significance of the lagged level indicates the existence of long-run relationship. The results of the bounds tests for cointegration are reported in Table 2 which yields three important results as follows:

(i) The null hypothesis of no cointegration cannot be rejected in Bangladesh, India and Sri Lanka as the F-statistic for these countries are lower than the lower bound critical values.

(ii) With regards to Pakistan, the result is inconclusive when export is the dependent variable as the F-Statistic of 7.36 is greater that the lower bound critical value of 7.08 but lower that the upper bound critical value of 7.91.

(iii) The null hypothesis of no cointegration is rejected in Nepal as the calculated F-statistic (8.35) is higher than the upper bound critical value (7.98). This indicates that exports and imports in Nepal are cointegrated and that exports are the long-run forcing variable of imports.

Table 2: F- tests for testing the long-run relation between exports and imports

Country	Calculated F-Statistic	Conclusion
Bangladesh	F(X/M) = 3.2071	No Cointegration
	F(M/X) = 3.2963	No Cointegration
India	F(X/M) = 5.4988	No Cointegration
	F(M/X) = 5.6525	No Cointegration
Nepal	F(X/M) = 4.1267	No Cointegration
	F(M/X) = 8.3549	Cointegration
Pakistan	F(X/M) = 7.3555	Inconclusive
	F(M/X) = 1.5281	No Cointegration
Sri Lanka	F(X/M) = 3.2951	No Cointegration
	F(M/X) = 3.4370	No Cointegration

Note: The relevant critical value bounds for case V: unrestricted intercept and unrestricted trend at the 5 percent level are obtained from Narayan (2005). Critical values for Bangladesh (**7.**360-8.265); Nepal (7.135-7.980); India, Pakistan and Sri Lanka (7.080- 7.910)

The results from the above analysis suggest that for Bangladesh, India and Sri Lanka there is no cointegration between exports and imports. What does cointegration or lack of cointegration between imports and exports tell us about the state of the economy? According to Husted (1992), cointegration is to be expected under the maintained hypothesis that the economy is working properly, and that breaking international budget constraints leads to a lack of cointegration. This implies that sustained external imbalances are the outcome of distorted markets, or 'bad policy'. Irandoust and Ericsson

(2004) argue that lack of cointegration suggests fundamental policy problems, unless there are permanent productivity shocks that lead to a non-stationary import–export relation. In a well functioning economy without permanent one-sided productivity shocks, cointegration is to be expected. However, given the current global environment, the external balance is determined not only by trade balance, but also by the balance in the services and payments sector. This is more relevant to countries South Asian countries, where services exports and private remittances are very significant part of the current account. Generally speaking, the conclusion is that lack of cointegration suggests fundamental policy problems could be challenged in the current globalize economic environment. Therefore, future research should be directed to include those elements of the current account.

6. Conclusion

The purpose of this paper is to investigate the sustainability of current account of Sri Lanka by employing the Husted (1992) testing procedure. The bounds testing approach to cointegration is applied to test for the long-run equilibrium relationship between exports and imports in five south Asian countries, Bangladesh, India, Nepal, Pakistan and Sri Lanka. The results from the bounds tests don not support the existence of a long-run relationship between exports and imports in Bangladesh India and Sri Lanka; inconclusive results for Pakistan; and evidence of a long-run relationship between exports and imports in Nepal. The empirical findings suggest that the current account of these countries, with the exception of Nepal, is not sustainable and this violates its intertemporal budget constraint in the long-run. However, given the changes in the world trade system leading to exports in these countries consisting mainly of the services and remittances, further research is needed to include services and remittances of the current account.

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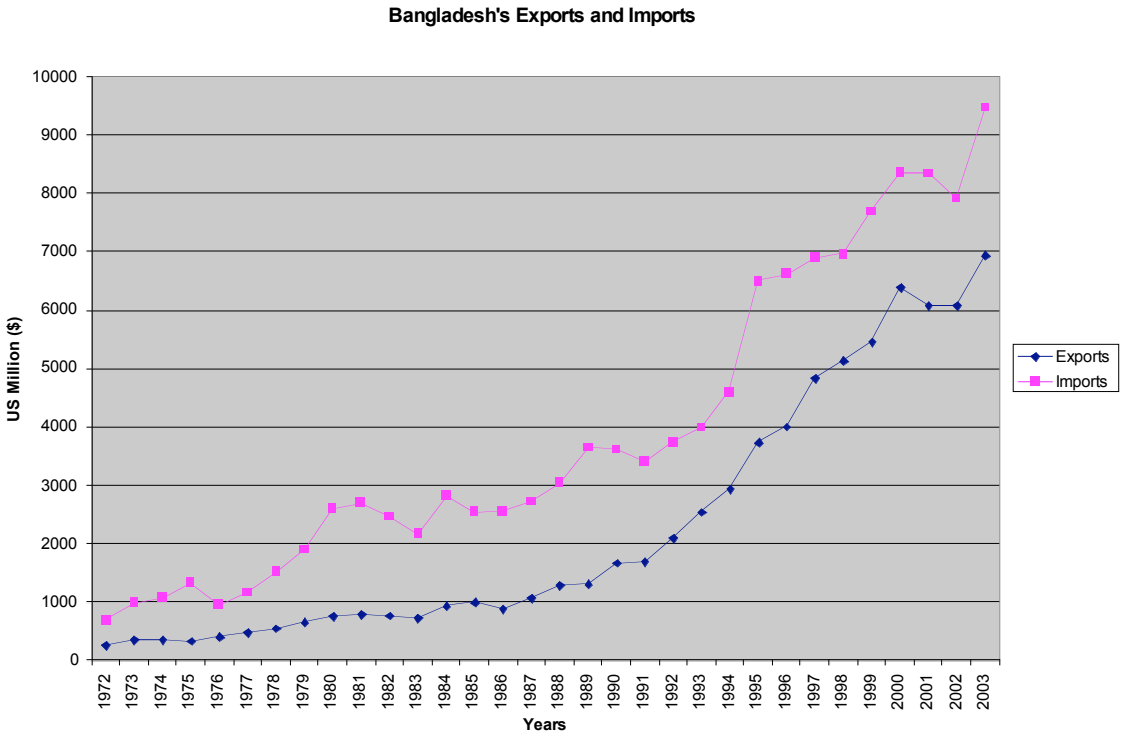
Appendix

Figure 1: Exports and Exports in Bangladesh 1972-2003



Source: World Bank Tables (2006)

Figure 2: Exports and Exports in India 1960-2003

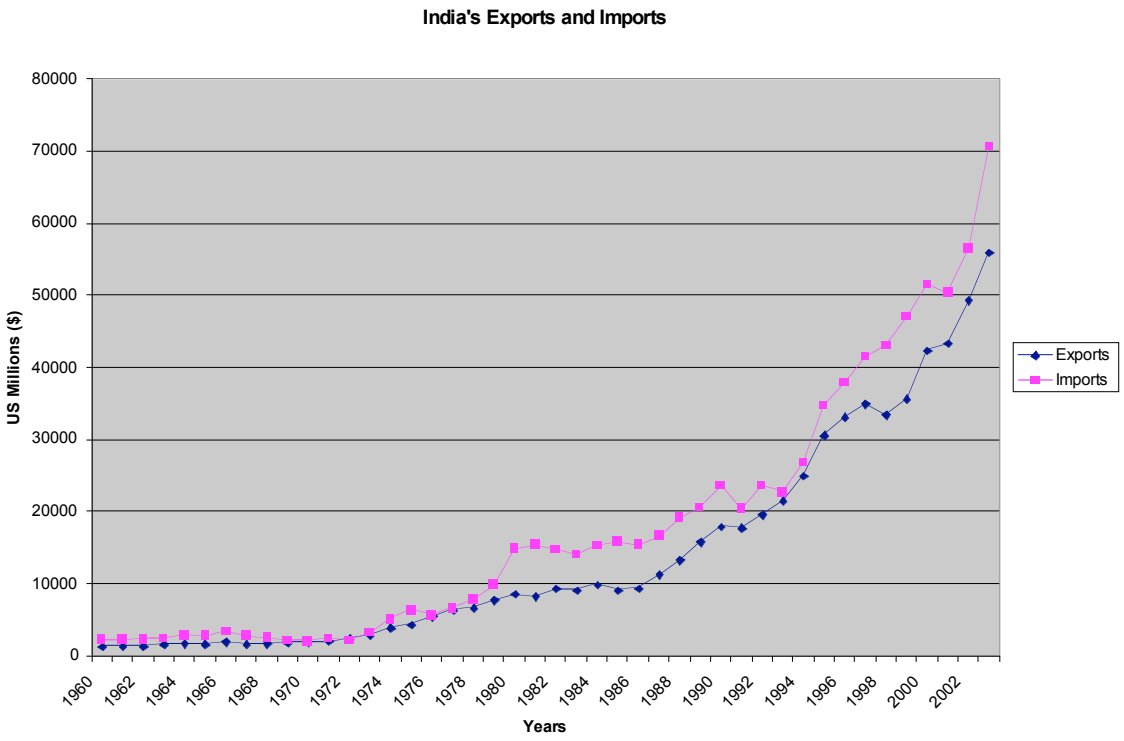
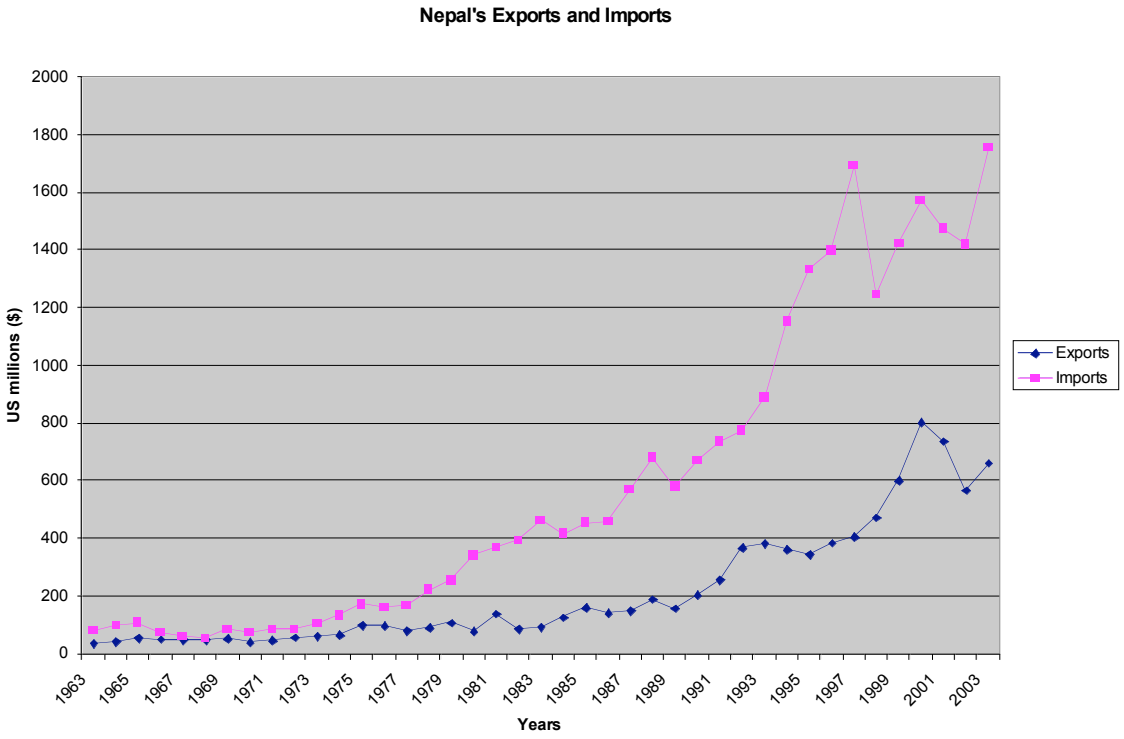
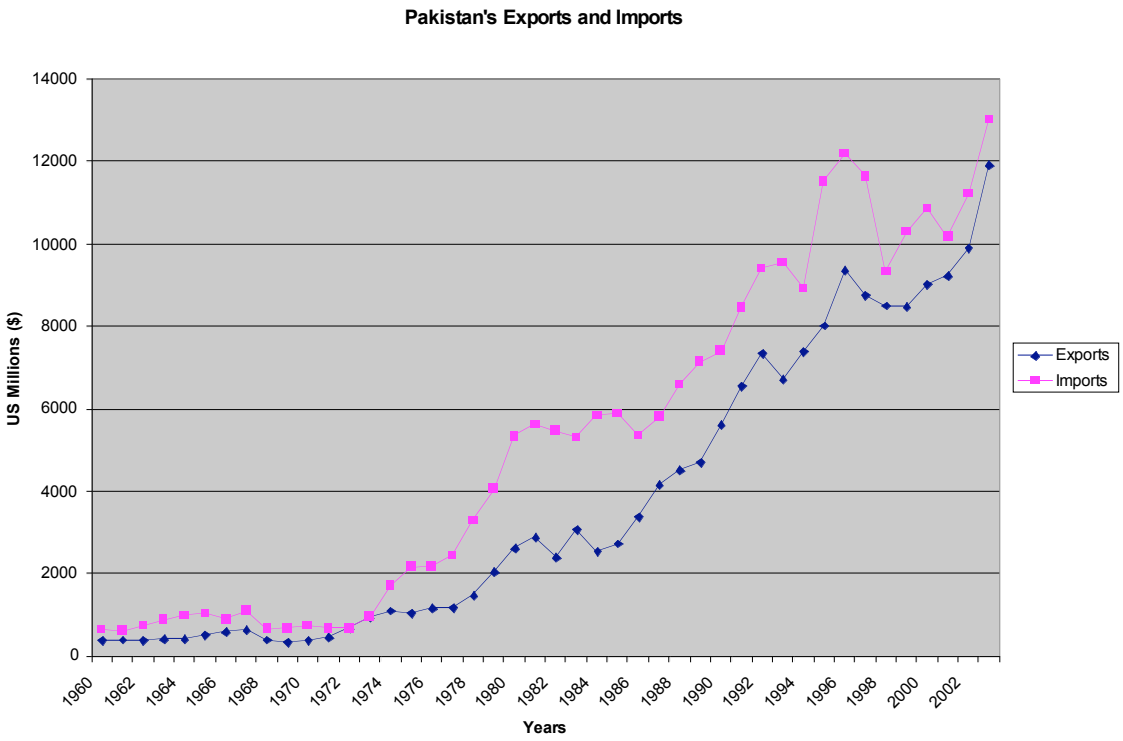


Figure 3: Exports and Exports in Nepal 1963-2003



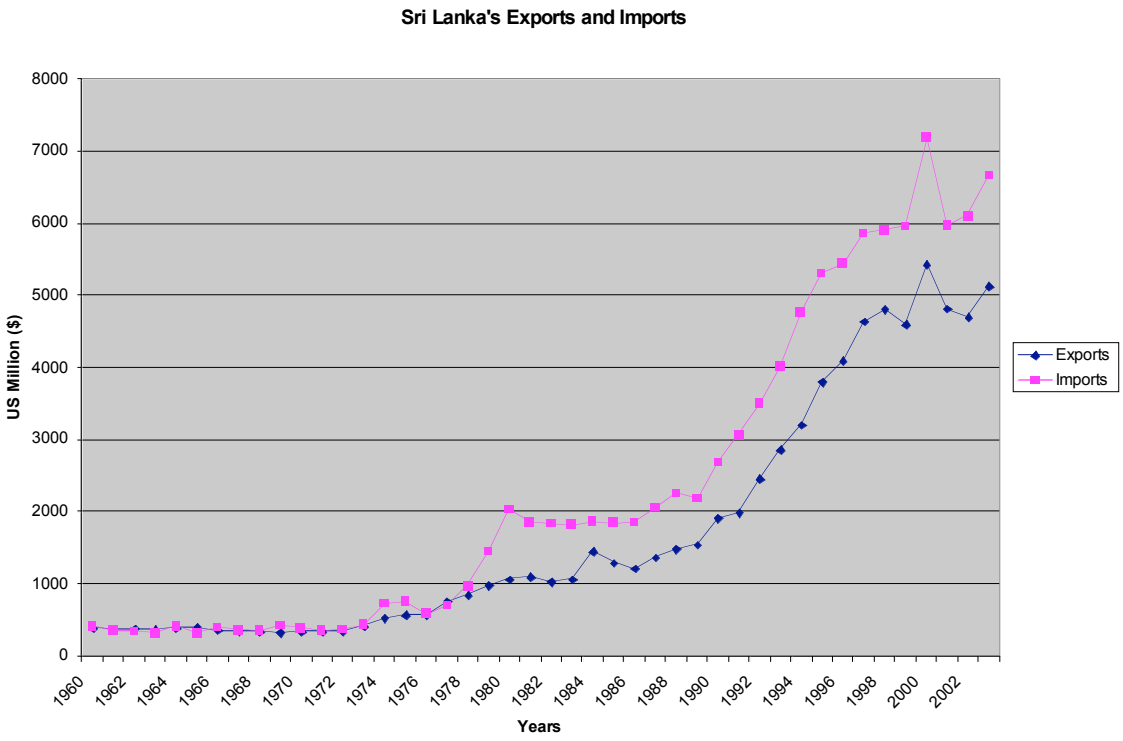
Source: World Bank Tables (2006)

Figure 4: Exports and Exports in Pakistan 1960-2003



Source: World Bank Tables (2006)

Figure 5: Exports and Exports in Sri Lanka 1960-2003



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