ANALYZING THE SUSTAINABILITY OF INDIA'S CURRENT ACCOUNT POSITION FOLLOWING THE REFORMS OF THE EARLY 1990S

Niloufer Sohrabji*

Abstract

Following the 1991 crisis, India undertook reforms that liberalized trade and investment. India faced current account deficits for most of the period following these reforms. This paper analyzes sustainability of India's current account position over the last decade using the intertemporal solvency model of Hakkio and Rush (1991) and Husted (1992). In this theoretical framework, the intertemporal solvency constraint is satisfied if there is cointegration between inflows and outflows of the current account. This paper finds cointegration between the series when allowing for a structural break using the Gregory and Hansen (1996) procedure. Dynamic GLS estimation shows a strong relation between India's current account inflows and outflows. Based on the empirical results, this paper concludes that there has been an improvement in trade patterns and despite experiencing deficits, India's current account position is sustainable.

Keywords: Cointegration, current account sustainability, dynamic GLS, India, intertemporal solvency

JEL Classification: C32, F32 and F41

* Correspondence to: Simmons College, Fenway, Boston 02115, email: sohrabji@simmons.edu, phone: 617-521-2587, fax: 617-521-3175. I am indebted to two anonymous referees for their insightful feedback. All errors remain mine.

1. INTRODUCTION

This paper examines the solvency of India's current account position over the last decade. Large and deteriorating current account deficits have played a role in the Mexican peso crisis in 1994, the East Asian crisis in 1997-1998 and Turkey's crisis in 2001. India experienced large current account deficits in the late 1980s and suffered a balance of payments crisis in 1991. Following the crisis, India undertook reforms that liberalized trade and investment. For most of the period since these reforms, India has experienced trade and current account deficits. This raises concerns about the liberalization reforms, including the possibility of another crisis, and makes it important to study India's current account position in this period.

Trade and current account deficits need not be problematic. If trade deficits are linked to poor terms of trade or because of a weak production base, then high import bills are a drain on the economy. On the other hand if a country is increasing imports of capital goods it indicates improvement in productive capacity which helps future trade balances. This is the basis of the intertemporal solvency model proposed by Hakkio and Rush (1991) and Husted (1992) which analyzes cointegration between exports and imports and other outflows of the current account.

Using the above theoretical framework this paper analyzes sustainability of the Indian current account since the reforms of the early 1990s. While cointegration between inflows and outflows is rejected for the period as a whole, there is evidence of cointegration when allowing for a structural break. Taken together these results indicate that there is an improvement in the current account position in this period. Based on cointegration results, the long run relationship between exports and imports and other debits is estimated. This paper finds evidence of a strong relation between current account inflows and outflows and concludes that despite the deficits, India's current account position is sustainable.

The paper is organized as follows: the next section provides background on India's current account position which is followed by a review of the literature. Section 4 presents the theoretical framework and empirical methodology for examining current account sustainability. Section 5 discusses the empirical results and the last section concludes.

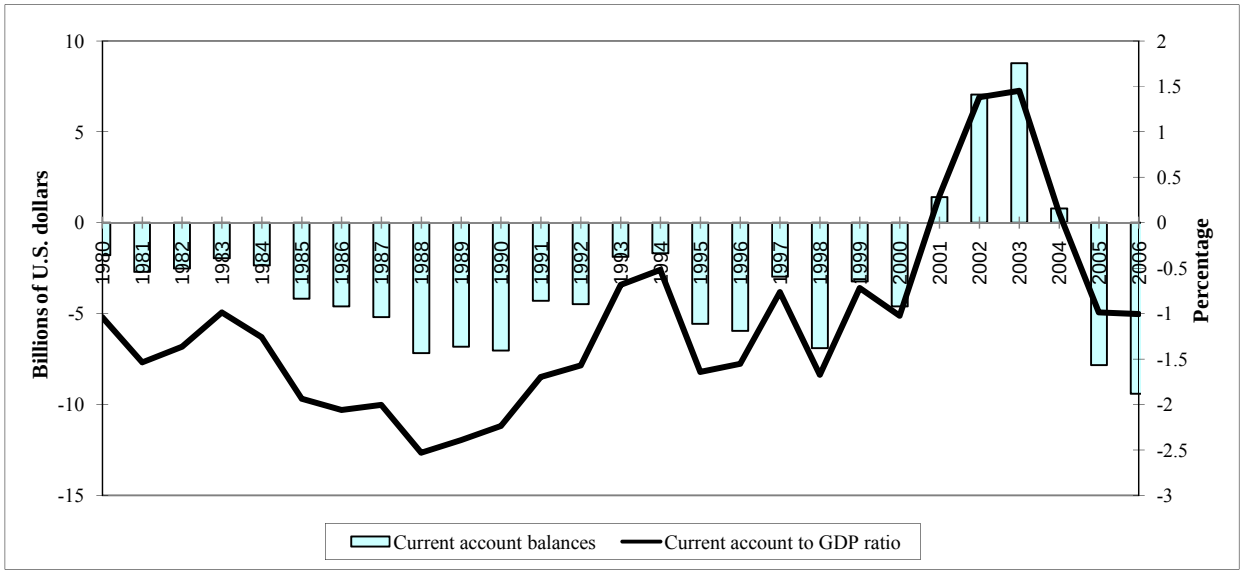
2. BACKGROUND

To determine the current state of India's external position it is useful to analyze the major changes in the current account over the last few decades. Figure 1 plots the trend in the overall current account position for India from 1980 to 2006 using two measures, levels of current account balances and the ratio of current account balances to GDP. Figure 2 maps out the different components of the current account including merchandise trade balance, services trade balance, net unilateral transfer account and net investment account. Together these graphs provide an interesting portrait of the Indian current account position over the last three decades.

India had a deteriorating current account position in the late 1980s (figure 1). The current account deficit was approximately $ 2 billion in the early 1980s (1980-1984) which jumped to over $ 4 billion by 1985. This trend continued for the remainder of the decade with the deficit exceeding $ 7 billion by 1990. This same trend is observed in the current account deficit to GDP ratios. This ratio was approximately 1% in the early 1980s which jumped to 2% by the mid-1980s and ending up at 2.24% in 1990.

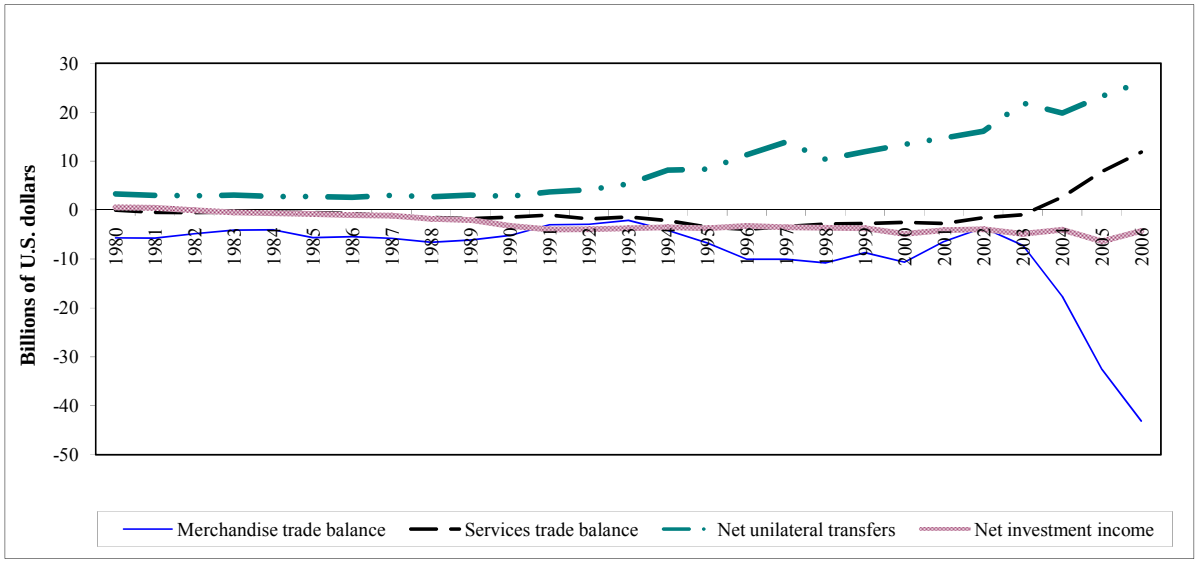
Three of the four components of the current account recorded deficits in this period (figure 2). These include merchandise trade balance, services trade balance and net investment income. While the net unilateral transfer account was in surplus for the entire decade, it was not enough to reverse the deficits in the other three accounts. Expectedly, merchandise trade account had the largest deficit and was the main driver of the current account deficit.

Figure 1: India's current account position [1980-2006]



Notes: The GDP series was expressed in Indian rupees and current account series in U.S. dollars. GDP was converted to dollars using the market exchange rate.
Source: International Financial Statistics database.

Figure 2: Components of India's current account balance [1980-2006]



Notes: The GDP series was expressed in Indian rupees and the components of the current account series in U.S. dollars. GDP was converted to dollars using the market exchange rate.
Source: International Financial Statistics database.

Given the deteriorating trend in the current account and its components during the 1980s it is not surprising that India experienced a balance of payments crisis in 1991. Following the crisis, India embarked on a liberalization program which resulted in increased foreign trade and

investment. While both exports and imports increased, the latter outpaced the former and thus India continued to experience trade deficits. From 1995 onwards there was once again a much worsened current account position (figure 1). By 1998, the current account deficit had reached the levels observed prior to the 1991 crisis (approximately $ 7 billion). At 1.67% however, the current account deficit to GDP ratio in 1998 was lower than those observed in the late 1980s (figure 1). The improved current account deficit to GDP ratios despite worsened current account deficits were due to the high growth levels observed in India in the 1990s.

The trend in the components of the current account observed in the previous decade accelerated in the 1990s. Net investment income which was declining in the 1980s worsened further in the following decade. This showed that in the 1990s, foreign investment in India yielded higher returns than Indian investment abroad. This is not surprising given the high levels of growth in India during this period and its rise as a significant emerging economy. Increased imports due to dismantling of trade barriers led to higher merchandise and services trade deficits in the 1990s compared to the 1980s. As in the 1980s, net unilateral transfer surpluses grew in the following decade. However, these surpluses were once again insufficient to overturn the deficits in the other three accounts. Thus, India experienced high current account deficits.

The 2000s started off with a significantly improved current account position for India. This was partly related to the dramatic increase in net unilateral transfer surpluses which reached $ 22 billion by 2003 (figure 2). Also, the growth of exports in both goods and services was significant leading to a decline in merchandise and services trade deficits. In fact, by 2003 trade of services recorded a surplus. Improvement in these three accounts was more significant than the deterioration of the net investment income account and thus India experienced current

account surpluses in the early 2000s. By 2003, current account surplus peaked at $ 8.77 billion and the current account surplus to GDP ratio reached 1.45% (figure 1).

The positive current account position turned negative in the mid-2000s with current account deficit to GDP ratios of approximately 1% in both 2005 and 2006 (figure 1). The levels of current account balances also saw a sharp reversal. From a surplus of $ 8.77 billion in 2003 the current account balance changed to a deficit of $ 7.84 billion in 2005 and worsened to $ 9.42 billion in 2006 (figure 1). In this period, net export of services and net unilateral transfers improved, reaching surpluses of $ 11 billion and $ 26 billion in 2006 respectively (figure 2). However, merchandise deficit grew more significantly and overturned the positive impact of these improvements. While export of goods was increasing rapidly, imports far outpaced exports and exacerbated the merchandise trade deficit which exceeded $ 43 billion in 2006 (figure 2).

This deteriorating trend has continued with merchandise trade deficit reaching $ 59.4 billion in 2007 (Indian Ministry of Finance, Economic Survey 2007-2008). This in turn led to an increased current account deficit which reached $ 17 billion in 2007 (Reserve Bank of India, Handbook of Statistics on Indian Economy October 2008). In recent years, India is one of the few major Asian economies suffering from a current account deficit. Understanding the cause of these deficits is critical in analyzing the sustainability of India's external position.

One major reason for the increase in merchandise trade deficit was the deterioration of terms of trade (Indian Ministry of Finance, Economic Survey 2006-2007). The value of exports could not keep pace with the value of imports resulting in trade deficits. Moreover, the rise in international crude oil prices which caused the value of petroleum, oil and lubricants imports to rise by 55% have contributed to this deficit (Reserve Bank of India, Monthly Bulletin 2008-

2009). While prices have declined, this remains a vulnerable component of India's current account position.

On the positive side, it is important to note that in 2004, there was an increase in the export of high valued engineering goods (Indian Ministry of Finance, Economic Survey 2004-2005). Further increases in these, and other high priced exports, could lead to improvements in India's trade position. The same report notes that the highest growth in imported goods was observed in capital goods in the early 2000s. This is important because capital goods add to productive capacity. Thus, increases in imports were not financing consumption, but rather should be viewed as investment. In turn, this investment helps growth in exports and GDP which can contribute to future current account sustainability.

Over the last decade the current account has worsened (late 1990s), improved (early 2000s) and is once again deteriorating (mid-2000s). The recently rising current account deficits may suggest that the current account position is once again becoming weaker. However, an examination of the different components of the current account reveals a more complicated picture. While larger merchandise import growth has contributed to deteriorating trade and current account deficits, the types of imports determine if this implies an unsustainable current account position. To shed light on this issue, this paper employs an intertemporal solvency approach using quarterly data from 1996-2006. The next two sections discuss the literature and framework for studying sustainability of the current account position.

3. LITERATURE

The intertemporal approach for exploring current account sustainability is based on the theoretical model of Hakkio and Rush (1991) and Husted (1992). Hakkio and Rush (1991) discuss sustainability in the context of budget deficits which has been used by Martin (2000) and

Baharamshah and Lau (2007) to examine fiscal sustainability for the U.S. and East Asian countries respectively. In the context of current account sustainability, the framework examines the long-run relation between inflows and outflows in the current account. This requires that exports of goods and services (inflows) be cointegrated with imports of goods and services, net unilateral transfer payments and net income payments (outflows). The three components that make up the outflows of the current account are referred to as imports+ for the remainder of the paper. Cointegration between these two series implies intertemporal solvency of the current account.

This model has been used by Husted (1992) and Fountas and Wu (1999) for the U.S., Leachman and Thorpe (1998) for Australia, Apergis, Katrakilidis and Tabakis (2000) for Greece, Arize (2002) for 50 developed and developing countries, Baharumshah, Lau and Fountas (2003) for Indonesia, Malaysia, Philippines and Thailand, Irandoust and Ericsson (2004) for 6 developed countries, Narayan and Narayan (2005) for 22 least developed countries, Kalyoncu (2005) and Oğuş Binatlı and Sohrabji (2009) for Turkey, Kim, Min, Hwang, and McDonald (2009) for Asian countries, Kónya (2009) for Czech Republic, Hungary and Slovenia and Lau, Oh and Wong (2009) for bilateral trade sustainability between Malaysia and two of its trading partners, China and India.

Current account sustainability for India has been studied by a few authors including Upender (2007), Kónya and Singh (2008) and Holmes, Panagiotidis and Sharma (2008). All papers test for cointegration between exports and imports+ and focus on the period between 1950 and 2005 approximately. Upender (2007) finds that exports and imports+ are cointegrated. Contradictory to this result, Kónya and Singh (2008) find no cointegration between exports and imports+ even after allowing for a break period in 1992-1993 due to a shift in the exchange rate regime.

Holmes, et al. (2008) find two regimes, one that lasts until late 1990s when India's exports and imports were not cointegrated and the other beginning in the late 1990s and ending in 2003 where there is cointegration.

This paper adds to these results and the larger literature by focusing on India's current account sustainability in the 1990s-2000s following the liberalization of the economy. As noted earlier, major changes were observed in the trade and current account position following the reforms in the early 1990s. Thus, this paper builds and extends the analysis of the second 'cointegrated period' studied by Holmes et al. (2008) and tries to reconcile the differing results by Upender (2007) and Kónya and Singh (2008). There are also some differences in the econometric methodology. With the standard Johansen test, this paper also employs the Gregory and Hansen (1996) procedure. The latter allows for the possibility of a break between exports and imports+ and endogenously determines this break. Results show that there is a structural break in the early 2000s which has changed the relationship between inflows and outflows of the current account in the last few years. Given this result, the long run equilibrium relationship between exports and imports+ is estimated using dynamic GLS. This paper finds evidence of a sustainable current account position over the last decade. The model and econometric methodology for studying current account sustainability is discussed below.

4. INTERTEMPORAL APPROACH FOR CURRENT ACCOUNT SUSTAINABILITY

This paper uses the intertemporal solvency theoretical framework of Hakkio and Rush (1991) and Husted (1992) to determine current account sustainability. The model assumes that the amount an open economy borrows or lends in the international market must equal the present value of surpluses or deficits (for a more complete discussion of the model see Oğuş Binatlı and

Sohrabji, 2009). A sustainable current account position indicates that present deficits can be repaid by future surpluses. This implies examining the following econometric relation,

$$X_t = \alpha + \beta MM_t + \varepsilon_t \quad (1)$$

where *X* equals exports of goods and services and *MM* equals imports of goods and services, net interest payments and net unilateral transfer payments (denoted as imports+).

Cointegration between exports and imports+ sheds light on current account sustainability. Tests for cointegration require that the series be nonstationary. Several stationarity tests are used including the Augmented Dickey-Fuller (ADF) test, the Phillips Perron (PP) test, the KPSS test[1] and the Zivot-Andrews test[2]. If the series are integrated of order one, cointegration tests can be conducted.

Cointegration is tested using the Johansen procedure (both trace and eigenvalue statistics). To allow for the possibility of a break in the cointegrating relation this paper follows Baharumshah et al. (2003), Cook (2004) and Oğuş Binatlı and Sohrabji (2009) in using the Gregory and Hansen (1996) cointegration procedure (denoted as the Gregory-Hansen procedure for the rest of this paper). This procedure endogenously determines the break for three different models denoted as level shift (C), level shift with trend (C/T), and regime shift (C/S) and are specified as:

Model with level shift (C) $$X_t = \mu_1 + \mu_2 D_t + \beta MM_t + \varepsilon_t \quad (2)$$

Model with level shift and trend (C/T) $$X_t = \mu_1 + \mu_2 D_t + \gamma t + \beta MM_t + \varepsilon_t \quad (3)$$

Model with regime shift (C/S) $$X_t = \mu_1 + \mu_2 D_t + \beta_1 MM_t + \beta_2 MM_t D_t + \varepsilon_t \quad (4)$$

where $D_t = \begin{cases} 0 \; if \; t \le \tau \\ 1 \; if \; t > \tau \end{cases}$ and τ is the structural break point.

The Gregory-Hansen procedure uses a grid search procedure for breakpoints in the 0.15N and 0.85N region (where N is the sample size). For each model the null hypothesis of no structural change is tested using the ADF statistic. If there is cointegration with a structural break, the long-run relationship between exports and imports+ can be estimated.

Following the literature, the long-run equilibrium relationship between exports and imports+ can be estimated using dynamic ordinary/generalized least squares (DOLS/DGLS) proposed by Stock and Watson (1993)[3]. Dynamic estimation includes the structural break information determined by the Gregory-Hansen procedure as well as lags and leads of the first difference of the regressors and is given as

$$X_t = \alpha + \beta MM_t + \delta\left(MM_t - MM_\tau\right)D_t + \gamma\, d\left(L\right)\Delta MM_t + \varepsilon_t \qquad (5)$$

where MM_τ is imports+ at the structural break point, ΔMM_t is the first difference of imports+, $d\left(L\right)$ is a polynomial in L which represents lags and leads and all other variables are as previously defined. The coefficient β captures the relation between exports and imports+ and thus sheds light on the sustainability of the current account position. If the relation between exports and imports+ is not statistically significant $\left(\beta \le 0\right)$ then the current account position is unsustainable since imports+ do not add to exports. A statistically significant and strong relationship between exports and imports+ $\left(\beta \ge 1\right)$ indicates that the country has a sustainable current account position. In this case, the country is satisfying the intertemporal budget constraint and can generate sufficient surpluses in the future to repay earlier current account deficits. Finally, a statistically significant but *weak* relation between exports and imports+ $\left(0 < \beta < 1\right)$ indicates that while imports+ contribute to the export base, the country's current account position remains vulnerable. The relationship is not strong enough to generate sufficient

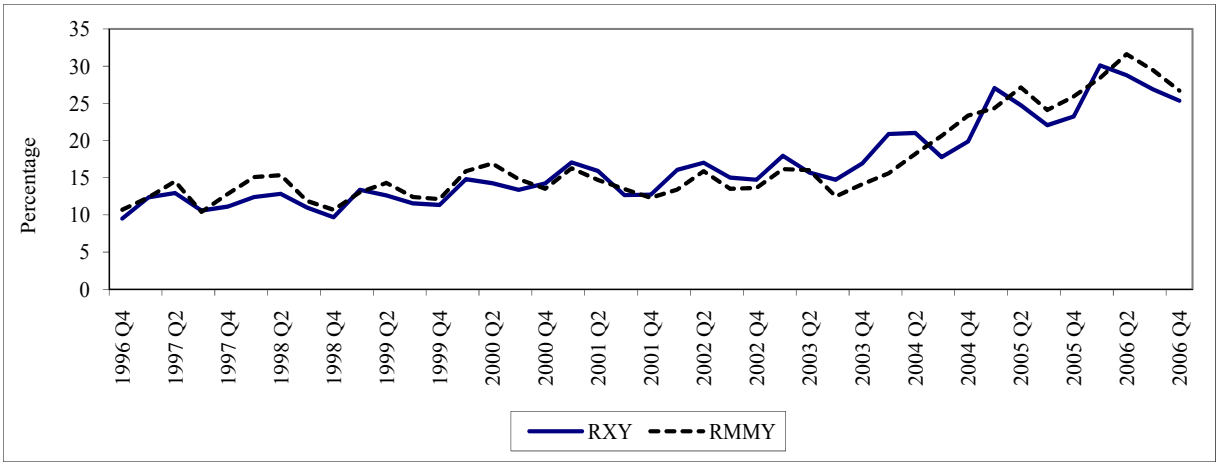
surpluses in the future to repay present deficits. The data and results are reported and discussed in the following section.

5. EMPIRICAL RESULTS

Following the literature, exports and imports+ are measured in real terms as a percentage of GDP denoted as *RXY* and *RMMY*. This paper focuses on the period after the 1991 crisis and subsequent reforms of the early 1990s. Lack of complete data for earlier years in the 1990s and 2007 onwards restricted the starting and ending point of the data set from 1996:Q4 to 2006:Q4.

The series include exports of goods and services, imports of goods and services, net interest payments, net unilateral transfer payments and GDP. GDP is expressed in Indian rupees and all other series are expressed in U.S. dollars. Real GDP is computed using the GDP deflator (base year = 2000). The real value of exports and imports+ are calculated by multiplying the series with the real exchange rate. The latter is computed from the market exchange rate (Indian rupee to U.S. dollar) and price levels (CPI) for India and for the U.S (base year = 2000). All data is available from the International Financial Statistics database. The data is seasonally adjusted using the X11 additive method. The series are plotted in figure 3.

Figure 3: Real exports and imports+ as percentage of GDP [1996:Q4-2006:Q4]



Source: International Financial Statistics database.

Figure 3 shows the changing trade patterns between the 1990s and 2000s discussed earlier. There were deficits during the 1990s which turned into surpluses at the beginning of the 2000s and reverted to deficits in the mid-2000s. More importantly, the graph also suggests a link between inflows and outflows which is tested later in this section.

Table 1 reports the unit root tests (assuming a constant only) for the series in levels and first differences. The test results support expectations that the series are I(1) in levels and I(0) in first differences. Results for tests assuming no deterministic component or with a constant and trend (not reported here) show similar results. Given these conclusions, the series are tested for cointegration using the Johansen approach and the Gregory-Hansen procedure.

Table 1: Unit Root Tests

Variables	***ADF***	***PP***	***KPSS***	**ZA**	**ZA break**
RXY	0.593	1.117	0.716*	-3.746	2004:4
	[0]	(10)	(5)	[0]	
Δ *RXY*	-6.377*	-6.388*	0.319	-6.055*	2004:2
	[0]	(4)	(5)	[3]	
RMMY	0.041	-0.068	0.601*	-3.746	2004:3
	[0]	(2)	(5)	[6]	
Δ *RMMY*	-5.174*	-5.205*	0.197	-5.849*	2003:4
	[0]	(2)	(2)	[0]	

*Notes: * indicates rejection of the null hypothesis at 5% level of signifcance. The null hypothesis for all tests except KPSS is that the series is nonstationary. All tests are conducted assuming a constant only. Stationarity tests assuming no deterministic component or a constant and trend which are not reported here to conserve space show similar results. Numbers in brackets for ADF and ZA tests denote lags. Maximum lags were set at 6 and lag length is determined using AIC. Numbers in brackets for PP and KPSS correspond to lag truncation parameter.*

The lag length for the VAR used for the Johansen test was determined to be 2 lags using AIC. Based on the data the Johansen test was conducted assuming an intercept and trend in the data and an intercept but no trend in the cointegrating equation. Following Baharumshah et al. (2003) this paper uses the Reinsel and Ahn (1988) degree of freedom correction given as

$(T - pk)/T$ where T is the sample size, p is the number of variables and k is the number of lags. This correction factor must be multiplied with the trace and eigenvalue statistics before comparing them to critical values. The Johansen cointegration test results for no cointegrating equations as well as at-most-one cointegration equation are reported in table 2. They indicate that there is no cointegration between the two series. This implies that the current account is unsustainable for the sample period as a whole.

Table 2: Johansen cointegration test results for *RXY and RMMY*

No. of CE(s)	Adj. trace value	5% c.v.	Adj. eigenvalue	5% c.v.
None	6.15	15.41	6.06	14.07
At most 1	0.09	3.76	0.09	3.76

Note: adjusted values imply that the statistics are multiplied by the small sample correction factor.

Given the changes in the trade and current account balances noted earlier, this paper explores if there is a structural difference between the 1990s and 2000s. In terms of the intertemporal solvency model, this implies testing for a break in the cointegrating relationship. This paper uses the Gregory-Hansen procedure to allow for the possibility of a structural break in the cointegrating relation. The results for the three models they discuss are presented in table 3.

Table 3: Gregory-Hansen cointegration test results for *RXY* and *RMMY*

	Model 1: C	Model 2: C/T	Model 3: C/S
t-statistic	-4.927*	-5.897*	-4.195**
Break period	2001:1	1999:1	2001:1
Lag length	[0]	[3]	[0]

*Note: * and ** denotes rejection of the null at 5% and 10% respectively.*

The Gregory-Hansen procedure shows evidence of cointegration between exports and imports+ with a structural break for India. This implies that while exports are not related to imports+ for the period as whole, there is a change in the relationship over the sample period.

The breaks are the first quarter of 2001 for the first and third model and the first quarter of 1999 for the second model (table 3). The break point of the first quarter of 2001 is selected for the estimation of equation (5) because it coincides with a few important changes in India's trade position.

The break period marks a turning point in the trade position. It is the first time there is a surplus recorded in current account balances (figure 1) although they do not last. This is related to high unilateral transfers (including remittances) and an improvement in both services and merchandise trade (figure 2). Although service exports remained less than imports for a few more quarters, the growth in exports of services began exceeding growth in imports of services in the early 2000s. This period also marks a significant growth of trade with countries in Latin America. While the regional partnership has been important since the mid-1990s, exports from India to countries in Latin America jumped from $ 0.9 billion in 2000 to $ 1.5 billion in 2001 (Indian Ministry of Commerce report, 2005). This was the largest annual jump in the entire period, although exports were growing throughout. Imports also rose in that period ($ 0.71 billion in 2000 to $ 1 billion in 2001) but they were less than the increase in exports. Finally, this period also coincides with a changing import position. As noted earlier, the highest growth rates in imports in the early 2000s are seen in capital goods which add to the productive capacity of a country. Thus, the evidence suggests that India was not importing primarily for consumption but rather investing in its future.

While cointegration results indicate that there are improvements in India's trading patterns it does not indicate that the current account position is sustainable. These results are used to estimate the long-run relation between exports and imports+ which can shed light on current account sustainability. As noted earlier, the break point from the first and third model (first

quarter of 2001) is used in estimating equation (5). Initially, dynamic OLS was used in the estimation. However, since the LM test showed evidence of serial correlation, equation (5) was re-estimated using dynamic GLS. The estimation was robust for departures from other standard assumptions such as heteroskedasticity, non-stability and non-normality. They are reported in table 4 with the results of dynamic GLS estimation.

Table 4: Dynamic GLS estimation

Diagnostic test results			**Dynamic GLS estimation results**		
White test (p-value)	RESET test (p-value)	Jarque-Bera test (p-value)	Adjusted R^2	$\hat{\beta}$ (SE)	$H_A: \beta < 1$ t-statistic
6.023 (0.813)	1.233 (0.267)	1.414 (0.493)	0.963	1.103* (0.327)	0.312

*Notes: The break period from the G-H procedure was used in the estimation. The lag and lead length for differenced RMMY terms were determined to be one according to AIC and SC. A preliminary test (LM test) showed evidence of serial correlation, so dynamic GLS was used. The table reports diagnostic tests of the null of homoskedasticity, stability and normality using the White test, RESET test and Jarque-Bera test respectively and results of the DGLS estimation. * denotes rejection of the null at 5% level of significance.*

The estimated relation between exports and imports+ captured by $\hat{\beta}$ is 1.103 with a standard error of 0.327. This is a high and statistically significant coefficient which suggests a strong relation between exports and imports. Moreover, the null of $\beta \geq 1$ cannot be rejected in favor of the alternative that $\beta < 1$ and thus the results show that India's current account position is *strongly* sustainable. For most of the sample period, India has recorded current account deficits. These deficits were particularly high at the beginning of the sample period. The empirical results indicate that these deficits can be viewed as an investment which has resulted in a healthy overall current account position.

Despite the positive results there could be reasons to be concerned about India's future current account position. Firstly, the improvement in trade and current account deficits (to surpluses) in the early 2000s has been reversed and deficits continue to grow (beyond the end of

the sample period). Moreover, while India's trade of services shows healthy surpluses and was helpful in improving trade balances, it remains a small component of overall trade. The same is true of the unilateral transfer account which is positive and growing but ultimately a modest element of the overall current account. Merchandise trade which continues to dominate the overall trade and thus current account position remains a vulnerable component. Merchandise exports have grown but have not kept pace with the explosion of imports. This could be further exacerbated by the global financial crisis and recession in the U.S. The U.S. continues to be a significant export partner for India with a share of approximately 15% in the last few years. A decline in demand from the U.S. due to the recession and possible protectionist policy could hurt the future sustainability of India's current account position.

Continued current account sustainability requires greater diversification of the export sector. Software services and engineering goods have been particularly successful for exports. Branching out into other dynamic sectors such as financial services and pharmaceuticals could reap greater benefits. In addition, diversification of India's trade partners and a reduced dependence on the U.S. will also help future current account sustainability. In recent years, there has been an increase in trade with China, Japan and EU and Latin American countries. Deepening and extending these trade relations will reap benefits for India. Also, increasing India's share in Asia as well as Australia and New Zealand will be beneficial.

6. CONCLUSION

This paper analyzes the sustainability of India's current account position from 1996-2006 using the intertemporal solvency model by Hakkio and Rush (1991) and Husted (1992). This framework examines the relation between current account inflows (exports) and outflows (imports+). Assuming both are integrated of order one, cointegration between exports and

imports+ implies that the intertemporal budget constraint of the current account has been satisfied and the current account is on a sustainable path.

The Johansen and Gregory-Hansen procedures are used to test for cointegration. The Johansen test shows no cointegration between exports and imports+ and thus intertemporal solvency is rejected for the period as a whole. The Gregory-Hansen test shows evidence of cointegration between the series with a structural break in the first quarter of 2001. This indicates a changed relationship between exports and imports+ in the 2000s. This relationship between exports and imports+ assuming the break (from the Gregory-Hansen results) is estimated using DGLS. The result reveals a strong and statistically significant relation between exports and imports+. This indicates that India's current account position was sustainable in the period following the reforms of the early 1990s.

These results capture important aspects of India's trading position. Earlier, the increased import bill was related to rising oil imports. However, since the early 2000s, there has been a significant growth in imports of capital goods. This improved composition indicates that imports are adding to productive capacity and can thus contribute to increased exports. Moreover, this period marks an improvement in some of the components of the current account notably in the trade of services. These improvements have contributed to India's current account sustainability in this period. To maintain future current account sustainability, India must diversify its merchandise export base (for example, towards the pharmaceutical sector) and increase and build on its trade partnerships (for example in Asia and Latin America).

NOTES

1. The KPSS (Kwiatkowski, Phillips, Schmidt and Shin) test is a test for stationarity around a level or a trend. As opposed to all other tests used, the null hypothesis for KPSS is that the series is stationary.

2. The Zivot-Andrews unit root test allows for structural breaks.
3. Stock and Watson (1993) noted that Monte Carlo studies show that dynamic OLS/GLS has lowest root mean square error of all asymptotic estimators.

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