

Working Paper 340

**Relationship Between
Services Trade, Economic
Growth and External
Stabilisation in India: An
Empirical Investigation**

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ISBN 978-81-7791-196-1

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RELATIONSHIP BETWEEN SERVICES TRADE, ECONOMIC GROWTH AND EXTERNAL STABILISATION IN INDIA: AN EMPIRICAL INVESTIGATION¹

Mini Thomas P*

Abstract

The economic reforms initiated in India after the emergence of the balance of payments crisis in 1990-91 resulted in the Government of India reversing its policy stand of import substitution, followed since independence. A policy of export-oriented growth was adopted, following the footsteps of East Asian countries. India's international trade in services benefited immensely from this change in policy stance, and received a further boost when India became a signatory to the WTO in 1995. In spite of this, India's external sector has come under growing pressure from a burgeoning Current Account Deficit, in the aftermath of the global economic recession of 2008-09. In such a scenario, this paper attempts to study the inter-relationships between services trade, economic growth and external stabilisation for the Indian economy, during the post-reform period. The contribution of international trade in non-factor services and other invisibles towards India's economic growth and current account stabilisation is examined descriptively. The relationship between the three macroeconomic variables is estimated using the ARDL approach to co-integration, for the time-span from 1996-97:Q1 to 2011-12:Q4. The study finds the existence of co-integrated relationship between Current Account Balance, GDP and services trade, for the Indian economy. The study also finds empirical evidence indicating that workers' remittances are more crisis prone compared to net services exports, in case of Indian economy.

Key words: Services Trade, Current Account Deficit, Economic Growth, ARDL approach
JEL Classification Code: F14, F32, F43

Introduction

International trade in services started expanding rapidly in the last decades of twentieth century, growing much faster than both world output and world merchandise trade. Global trade in services increased from USD1798.9 billion in 1991 to USD8699.8 billion by 2012 (UNCTAD 2013). International trade in services gained importance in policy-circles after the General Agreement on Trade in Services (GATS) came into being in 1995. Developing countries now account for one-fourth of the world trade in services. In spite of a rising contribution to services trade by developing countries, developed countries accounted for 67 per cent of world services exports and 59 per cent of world services imports in 2012 (UNCTAD 2013). Services trade is characterised by import of factors and brings along technology, which is a source of endogenous growth. New economy services, i.e., services that are increasingly tradable internationally on account of advances in ICT and raise productivity growth, have emerged as a powerful force contributing to economic growth and external stabilisation of many countries in recent years.

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¹ This paper is based on the author's ongoing doctoral dissertation, under UGC-Junior Research Fellowship Scheme, at Institute for Social and Economic Change. The author is very grateful to her PhD supervisor, Prof M R Narayana, for his valuable comments and suggestions on an earlier version of this paper. Thanks are also due to Ms B P Vani and an anonymous referee for their comments. However, the usual disclaimers apply.

The emergence of service sector-led growth in India is in consonance with the growing importance of services trade worldwide. The economic reforms initiated in India after the emergence of the balance of payments (BoP) crisis in 1990-91 resulted in the Government of India reversing its policy stand of import substitution, followed since independence. A policy of export-oriented growth was adopted, following the footsteps of East Asian countries. India's international trade in services benefited immensely from this change in policy stance, and received a further boost when India became a signatory to the WTO in 1995. As per GOI (2012), the share of services in India's total GDP at factor cost rose from 43 per cent in 1990-91 to 59 per cent in 2011-12. The service sector's annual GDP growth rate has been higher than the country's overall GDP since 1997-98. Services exports have been growing at a pace even faster than services GDP in the post-reform period, reflecting the export-oriented nature of India's service sector growth. India's share in global services exports stood at 3.2 per cent in 2012, whereas its share in global merchandise exports was only 1.6 per cent in the same year (WTO 2013).

Services exports also have the potential to bring about external stabilisation for the Indian economy. Since the advent of the global economic recession in 2008-09, India's external sector has been under growing pressure from the widening current account deficit (CAD). The CAD in 2011-12 was 4.2 per cent of GDP, historically the highest (even higher than the CAD of 3 per cent of GDP during the peak of the 1991 BoP crisis). The current account balance, which averaged nil over the Tenth Plan period, deteriorated during the Eleventh Plan to an average CAD of 2.4 per cent. The Approach Paper to the Twelfth Five-year Plan (GOI 2011, 21) has stated that for prudent management of the external account, it is desirable to restrict the CAD to an average below 2.5 per cent of India's GDP over the plan period. This is the CAD that would be commensurate with the 12th Plan growth target of 9-9.5 per cent. Excessive CAD tends to make an economy vulnerable to external debt and currency crisis, and brings along financial instability, substantial output and welfare losses. An RBI study (R Goyal 2012, 1) has concluded that a CAD between 2.4-2.8 per cent of GDP is sustainable over the medium term, under the assumptions that GDP growth ranges between 6-8 per cent, inflation hovers around the 5 per cent level, and interest rate and size of capital flows broadly follow their trends in the recent past.

There are three different perspectives on current account balance: a domestic perspective based on national income and product accounts; an international perspective based on trade flows in goods and services; and another international perspective based on flows and holdings of financial assets. Each perspective involves a decision to focus on certain variables or economic relationships and to de-emphasise or ignore other variables and relationships (Mann 2002, 134). This study will focus on the second perspective, based on international trade flows in goods and services. It has also been noted that the CAD in the Indian economy is influenced more by external factors such as oil supply shocks or the sudden collapse of export markets rather than domestic saving and investment rates (A Goyal 2012). Given this background, this paper attempts to examine the relationship between services trade, economic growth and external stabilisation for the Indian economy.

Review of Literature

Services have not figured prominently in economic growth theory, and have only recently been highlighted in international trade theory. However, the relationship between international trade and economic growth has been extensively studied in the literature. Proponents of the export-led growth hypothesis (Beckerman 1965; Balassa 1978; Feder 1982) have argued that export growth leads to an expansion in production via the foreign trade multiplier, economies of scale and technological innovation. A few others (Vernon 1966; Krugman 1984; Bhagwati 1988) have focussed on the reverse causality channel, wherein increase in skilled labour and technology in the domestic economy stimulates productivity gains, which give rise to comparative advantage in certain sectors, and eventually export expansion. Endogenous growth models emphasised imports as an important channel for long-run economic growth, by providing domestic firms with access to foreign technology and R&D knowledge (Grossman and Helpman 1991; Lee 1995). Oulton (2001) proved that international trade in services increases overall growth, because greater outsourcing of services by productive firms in non-stagnant sectors entails a reallocation of factors, which increases overall output and aggregate productivity.

Pradhan (2010) examined the export-led growth hypothesis for the Indian economy. The time-frame of his study was from 1970-71 to 2009-10, and covered exports of both goods and services. Using the Engle-Granger approach to co-integration and the vector error correction model (VECM), he found that about 14 per cent of disequilibrium is corrected every year in the case of "exports of goods and services" and GDP. He also found that the direction of causality was from export growth to GDP growth. He did not find any empirical evidence suggesting a reverse causation. Dash and Parida (2012) examined the role of services exports and services imports in India's economic growth, using a bound-testing approach to an auto-regressive distributed lag (ARDL) model and VECM. Using quarterly data from 1996-97 to 2010-11, they found the existence of a long-run equilibrium relationship between GDP, services exports, services imports and the real effective exchange rate (REER) for the Indian economy. The direction of short-run causality was found to be present only from services exports to GDP, and not vice-versa.

The relationship between the current account balance (CAB) and economic growth has been examined in international theoretical and empirical studies. Brissimis *et al* (2010) postulated that a small open economy that starts from a relatively low domestic income is expected to have low savings, as optimal consumption levels are high relative to current income. This implies increased external borrowing against future income, which coupled with substantial initial investment needs, would translate into a larger current account deficit at an early stage of development. As the economy catches up and a higher level of development is achieved, external financing needs tend to moderate. Hence, relative real GDP per capita is expected to be positively related to the current account balance. According to Obstfeld and Rogoff (2007), economies that are in the early stages of economic development have a greater need for investment and are likely to finance investment through external borrowing. As they develop and approach the income levels of advanced economies, their CAB should improve. Among countries at a similar initial stage of development, the stronger a country's economic growth is relative to its trading partners; the lower the current account is likely to be. Hence, theoretically, causality is found to run from economic growth to CAB. Estimating cross-country

regressions for the time-span from 1974-2004, Edwards (2007) found that a decline in GDP growth of 1 percentage point relative to the long-term trend resulted in an improvement in the CAB – higher surplus or lower deficit – of one quarter of a percentage point of GDP. Sekmen and Calisir (2011) examined the trade-off between CAD and economic growth for Turkey for the period from 1998 to 2009. Using VECM and ARDL models, they found the existence of a positive relationship between economic growth and CAD in the short-run. However, there have been no Indian empirical studies analysing this relationship.

Mann (2004) proposed two channels through which rise in new economy services would impact the trajectory of the US current account. First, increased trade in new economy services has improved the income-elasticity asymmetry of US trade. Second, integration of new economy services in the domestic economies of US's trading partners will raise economic growth there. After estimating new income elasticities for US exports and imports of "new economy services" and incorporating it into a simple model of the US current account, she concluded that reasonable estimates of the above two structural changes are not sufficient to stabilise the US current account deficit, partly because the share of new economy services in US trade is still small.

However, these two changes were found to help slow the further widening of the US CAD. Rath and Rajesh (2006) studied the trend in India's services exports and CAD for the post-reform period, using descriptive statistics and growth rates. The period of their study was from 1990-91 to 2005-06. They found that the rising surplus in net services exports have been significantly responsible for lower CAD in the Indian economy since the early nineties. Ghose (2013) argued that there are two choices before the Indian government in dealing with the widening CAD, namely, attracting foreign investment or imposing curbs on merchandise imports. According to him, attracting foreign investment is a greater evil because it implicitly makes the judgement that the risk of economic collapse tomorrow is preferred to the risk of higher inflation and lower growth today.

Dhar and Rao (2014) examined the causes behind the sharp deterioration of India's CAD to 5% of GDP in recent years. They found that surge in imports (mainly crude oil and gold imports), and indifferent manufacturing export performance, contributed to India's merchandise trade deficit of 11% of GDP in 2012-13. Secondly, India couldn't penetrate much into the markets of partner countries, with whom economic partnership agreements were signed. It was found that India's imports from partner countries grew at twice the rate of India's exports to partner countries, since mid-2000s. Thirdly, investment income outflows in India's invisibles account, especially royalty payments and remittances for maintenance of offices abroad, increased rapidly since 2010-11, all of which contributed to India's ballooning CAD.

Methodology

As per IMF's balance of payments framework, the current account balance is defined as the sum of net exports of goods and services, (net of) primary income and (net of) secondary income. The sum of "investment income" and "compensation of employees" is referred to as primary income. The sum of "private transfers" and "official transfers" is referred to as secondary income. Primary income, secondary income and trade in non-factor services are categorised as "invisibles" in this framework. External stabilisation is being defined as "current account stabilisation" in this study. India's

international trade in services is measured in terms of "net exports of non-factor services". India's economic growth is measured in terms of gross domestic product at market prices. The Reserve Bank of India's (RBI) definition of the service sector, inclusive of "construction activities", is adopted for this study.

An in-depth analysis of the contribution of services trade and other invisibles towards India's economic growth and external stabilisation is initially carried out, with the help of growth rates and percentage shares. The contribution of net services exports and private transfers in bringing down India's CAD is compared, to identify which of these invisibles have played a bigger role in India's external stabilisation. Balance of payments data published in "Handbook of Statistics on Indian Economy (HBSIE) 2011-12" of RBI, is the main data source for this study. The accounting relationship between services trade and economic growth for the Indian economy is analysed, using the national income accounting framework. The time span for this descriptive analysis is the post-reform period, from 1990-91 to 2011-12. A decomposition analysis of the contribution of other invisibles towards the growth in India's national disposable income is also carried out, with the help of the methodology utilised by Jalava and Pohjola (2002). Data published in National Account Statistics (base year: 2004-05) of Central Statistical Organisation is used for the empirical analysis based on national income accounting framework.

Afterwards, time-series analysis is carried out to examine the nature of the relationship between net services exports, economic growth and current account balance during the post-reform period. Quarterly data on all three variables, from 1996-97:Q1 to 2011-12:Q4, at current prices, is compiled from HBSIE 2011-12, published by RBI. The year 1996-97 is chosen as the starting point for the time series analysis, since quarterly data on India's GDP is available only from that particular year. Moreover, India's services trade received a boost post-1995 once GATS became operational facilitated by access to a growing overseas market. All three variables are initially tested for their stationary properties, using unit-root tests. In this study, the bound testing approach to Auto-Regressive Distributed Lag (ARDL) model developed by Pesaran *et al* (2001) is used to check for the presence of co-integration. This approach is preferred because the direction of causality among the variables is known beforehand. Moreover, the bound-testing approach can be used regardless of whether the time-series is stationary or integrated to the first order or a mixture of both.

Empirical Results

1. Contribution of Services Trade and other invisibles towards India's external stabilisation

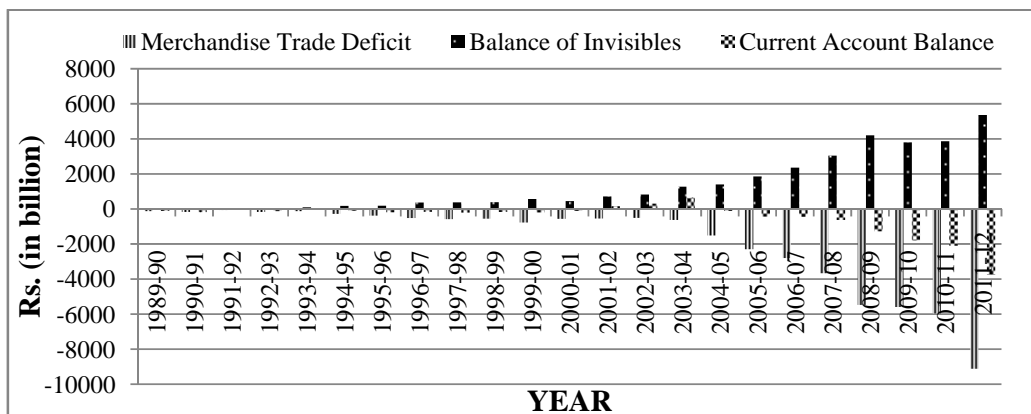
Invisibles is an important component of India's balance of payments (bop), and has become crucial for India's external stabilisation in recent decades, as is evident from figure 1. Balance of invisibles is found to be in surplus (except during the 1990-91 balance of payments crisis) throughout the study period, although the magnitude of the invisibles balance witnessed a phenomenal increase only after the 1991 economic reforms.

In December 1990, India was at the brink of a foreign-exchange crisis, wherein foreign exchange reserves had depleted to such a level that India could afford only three weeks of imports.

India's Current Account Deficit stood at 2.96 % of GDP in 1990-91. The Reserve Bank of India had to temporarily pledge gold to raise loans to tide over the bop crisis. India has come a long way ever-since, on the external front, with the growing contribution of invisibles in bringing down India's Current Account Deficit. Invisibles greatly benefited from the economic reforms and opening up of the Indian economy, post 1991. India's balance of invisibles which was ₹ 42.59 billion in 1991-92, grew at a CAGR of 25% over the next 20 years, and stood at ₹ 5362 billion in 2011-12. Current Account is defined to be the sum of "merchandise trade balance" and "balance of invisibles" of a country. India even managed to register a current account surplus during three years, 2001-02, 2002-03 and 2003-04, due to a significant surplus in the Invisibles account. Invisibles account is found to be in surplus even during the peak of the global economic recession in 2008-09. On the other hand, merchandise trade has consistently been running on deficit throughout the study period. The balance on the current account is being bogged down by the negative balance on the merchandise trade account, because of which India always suffers from a current account deficit. The global economic meltdown of 2008 has adversely affected India's current account balance, resulting in CAD exceeding 2% of GDP in recent years.

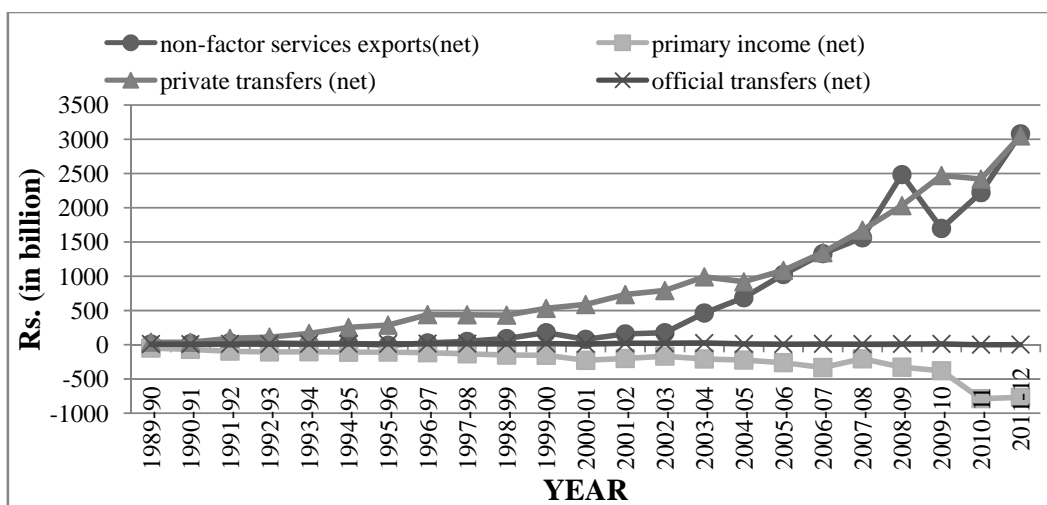
Figure 2 reveals the growth pattern of different components of India's invisibles. It is found that the remarkable surplus witnessed in India's balance of invisibles during the post-reform period can be mostly attributed to workers' remittances (net) and net non-factor services exports. Private transfers more than doubled within a span of one year after the BoP crisis, from ₹ 37.12 billion in 1990-91 to ₹ 93.82 billion in 1991-92. Private transfers have grown rapidly ever since, and stood at ₹ 3050 billion in 2011-12. India is currently the largest recipient of workers' remittances world-wide. Although net exports of non-factor services more than doubled from ₹ 12.05 billion in 1989-90 to ₹ 31.33 billion in 1991-92, it fell during the next five years. It started increasing again from 1997-98, after the benefits of India becoming a signatory to the GATS of WTO started trickling down. Major growth spurt in India's international trade in non-factor services happened only in the last decade. Primary income (net) is found to be in deficit throughout the study period, mainly due to the increasing outflows on account of investment income. The magnitude of official transfers, another component of Invisibles account, increased moderately since 1990-91, and peaked during 2001-2002, 2002-03 and 2003-04, when it contributed to India's current account surplus. The contribution of official transfers to the balance of invisibles is found to be negligible since then.

Figure 1: India's Current Account Dynamics during the Post-reform period



Source: Author's compilation based on data from Handbook of Statistics on Indian Economy 2011-12, RBI

Figure 2: Trend in Invisibles in India's Current Account

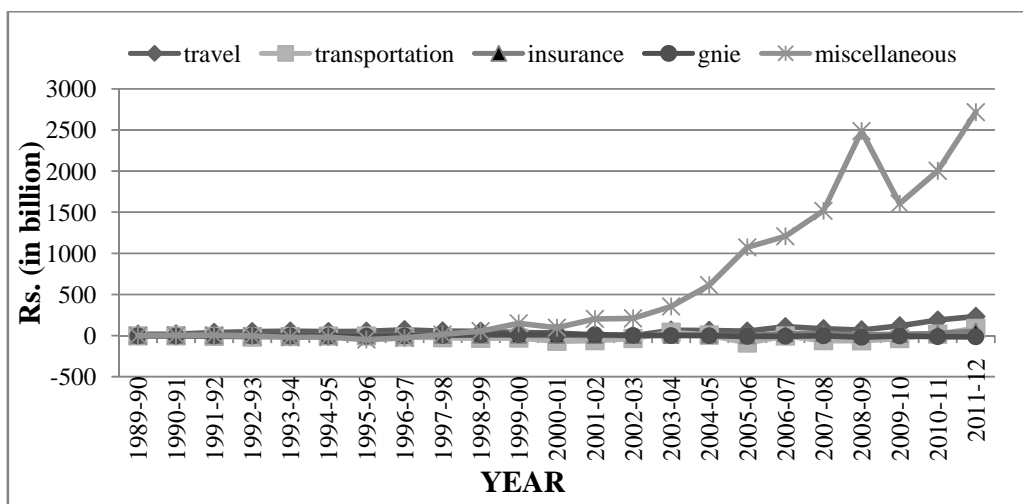


Source: Author's compilation based on data from Handbook of Statistics on Indian Economy 2011-12, RBI

Figure 3 reveals the growth pattern of different components of India's net non-factor services exports during the post-reform period. Non-factor services, as per RBI classification, include travel, transportation, insurance, g.n.i.e. (government not included elsewhere) and miscellaneous services. Net exports of travel services is found to be the top contributor to India's total net non-factor services exports in the 1990s, up to 1997-98. However, it is clear from the figure that net exports of miscellaneous services have emerged as the major contributor to India's non-factor services export basket since late 1990s. Net exports of miscellaneous services grew at a CAGR of 35% during the 14-year period, from 1998-99 to 2011-12. Business services, finance and communications, which are categorised as "miscellaneous services" in India's balance of payments, are known as "new economy

services" world-wide. The contribution of insurance and g.n.i.e services to India's net exports of non-factor services is found to be negligible, especially post 2000. Net receipts from trade in transportation services are found to be even negative during most of the study period.

Figure 3: Trend in different components of India's net exports of non-factor services



Source: Author's compilation based on data from Handbook of Statistics on Indian Economy (HBSIE) 2011-12, RBI

It is well-established by now that Invisibles is the major contributor to India's external stabilisation during the post-reform period. However the policy-relevant question here is, whether private transfers (net) or net services exports have played a bigger role in bringing down India's Current Account Deficit. External stabilisation is being measured in terms of current account deficit as a percentage of India's GDP at Market Prices, in this study.

Table 1 gives a comparative picture of the role of private transfers and net services exports in India's current account stabilisation. It is found that India's current account deficit would have been of a much bigger magnitude which would have proved unsustainable for the economy, in the absence of these crucial components of India's balance of payments. It is found that the contribution of private transfers in bringing down India's Current Account Deficit is higher than that of net services exports during the 1990s and even during India's balance of payments crisis in 1990-91. In the absence of private transfers, the current account surplus that India registered during the years 2001-02, 2002-03 and 2003-04; would have turned into a current account deficit. However, the period since 2004-05 is quite crucial, while analysing the contribution of net services exports towards India's external stabilisation.

The gap in magnitude between net service exports and private transfers started declining, post 2004-05. It is found that the contribution of private transfers and net services exports in bringing down India's Current Account Deficit is almost the same during the years, 2005-06 and 2006-07. However, the magnitude of net services exports is found to be much higher than private transfers in 2008-09. During the peak of the global economic recession in 2008-09, the contribution of net services exports towards India's current account stabilisation exceeded that of private transfers. In the absence of net

services exports, India's CAD would have been 6.7% of GDP in 2008-09, instead of the actual CAD of 2.3%. In the absence of net private transfers, India's CAD would have been 5.9% of GDP in the same year. Even in 2011-12, the magnitude and contribution of net services exports to India's external stabilisation exceeded that of private transfers. In the absence of any of these two crucial components in the invisibles account, India's CAD would have exceeded 7.5% of GDP in 2011-12, which would have pushed the economy into another external crisis.

The interesting finding here is the contrasting behaviour of private transfers and net services exports during the peak of India's balance of payments crisis in 1990-91, and the global economic crisis in 2008-09. Remittances to India were adversely affected during both these years. Remittances, which registered an annual growth rate of 24.4 per cent in 2007-08, declined to 21.3 per cent in 2008-09, in response to the global economic meltdown that year. It is also found that private transfers declined by 2.3 per cent in 1990-91 over the previous year. India's international trade in services, on the other hand, is found to be relatively resilient during the recent economic recession, which was also noted by Borchert and Mattoo (2009). Net services exports registered an annual growth rate of 59 per cent in 2008-09, compared to 17.4 per cent in 2007-08. Most of it can be attributed to India's net exports of miscellaneous services in particular, which registered a spectacular growth in 2008-09 (refer Figure 3). It is also found that net services exports grew by 46 per cent even in 1990-91 over the previous year. Private transfers is thus found to be more crisis prone compared to net exports of non-factor services, in the context of Indian economy.

In this context, it is also interesting to note the factors which drive growth in private transfers and net exports and non-factor services. The literature broadly distinguishes between an altruistic motive to remit earnings to the migrant's native country (mostly for consumption by the family); and an investment motive, wherein remittances are sent either to invest in the native country or to repay previously borrowed funds. Gupta (2005) analysed the macro-economic determinants of workers' remittances to India from 1991 to 2002. She found that the growth in remittances over time can be explained by the increase in migration from India and total earnings of the migrants. Remittances were also found to be determined by the economic activity in the source countries, and it was higher when economic conditions abroad were benign. None of the remaining variables considered in her study, including political uncertainty, interest rates, or exchange rate depreciation, were found to affect remittances significantly. As per national income accounting identity, the difference between savings and investment (S-I) of a country should equal its net exports of goods and services (X-M). There are a wide range of factors which determine a country's net exports of goods and services, namely, foreign and domestic income, exchange rates, trade restrictions such as customs duties and tariffs, subsidies, non-tariff barriers, tastes and cultural preferences, technology etc.

Table 1: Role of Private Transfers versus Net Services Exports in India's External Stabilisation

| Year | Net Services Exports | Private transfers (net) | Current Account Deficit | CAD without net services Exports | CAD without private transfers |
|---|----------------------|-------------------------|-------------------------|----------------------------------|-------------------------------|
| (as percentage of GDP at Market Prices) | | | | | |
| 1989-90 | 0.2 | 0.8 | -2.27 | -2.5 | -3.03 |
| 1990-91 | 0.3 | 0.6 | -2.96 | -3.3 | -3.6 |
| 1991-92 | 0.5 | 1.4 | -0.3 | -0.8 | -1.7 |
| 1995-96 | -0.06 | 2.3 | -1.6 | -1.5 | -3.9 |
| 2000-01 | 0.4 | 2.7 | -0.5 | -0.9 | -3.2 |
| 2001-02 | 0.7 | 3.1 | 0.7 | 0.02 | -2.4 |
| 2002-03 | 0.7 | 3.1 | 1.2 | 0.5 | -1.9 |
| 2003-04 | 1.6 | 3.5 | 2.3 | 0.6 | -1.2 |
| 2004-05 | 2.1 | 2.8 | -0.4 | -2.5 | -3.2 |
| 2005-06 | 2.8 | 2.9 | -1.2 | -3.96 | -4.1 |
| 2006-07 | 3.1 | 3.1 | -1.03 | -4.1 | -4.2 |
| 2007-08 | 3.1 | 3.4 | -1.3 | -4.4 | -4.6 |
| 2008-09 | 4.4 | 3.6 | -2.3 | -6.7 | -5.9 |
| 2009-10 | 2.6 | 3.8 | -2.8 | -5.4 | -6.6 |
| 2010-11 | 2.9 | 3.2 | -2.7 | -5.6 | -5.9 |
| 2011-12 | 3.5 | 3.4 | -4.2 | -7.72 | -7.69 |

Source: Author's Calculations based on data from Handbook of Statistics on Indian Economy 2011-12, RBI

2. Accounting relationship between services trade and economic growth

According to the expenditure approach to national income accounting, GDP at market prices of any country is the sum of consumption, investment and net exports of goods and services. In this framework, consumption includes both private final consumption expenditure and government final consumption expenditure. Investment is measured in terms of Gross Capital Formation; as the sum of gross fixed capital formation, change in stocks and valuables. Using this framework, the accounting relationship between economic growth and services trade is being examined by separating out net services exports from India's total net exports of goods and services. Table 2 gives the percentage share of different components of India's GDP at Market Prices (base year: 2004-05) during the post-reform period, from 1990-91 to 2011-12. For this analysis, annual data on relevant variables published in National Account Statistics (base year: 2004-05), at current prices (in ₹ crore), is utilised. It is found that the percentage share of net services exports in India's GDP at market prices was less than 1 per cent throughout the 1990s. However, the share of net services exports is found to be much better in comparison with net merchandise exports, whose share in India's GDP is found to be negative throughout the post-reform period.

Merchandise trade deficit widened to a maximum of -10.01 per cent of GDP in 2011-12 due to massive gold and oil imports, which resulted in India's Current Account Deficit registering a historic high of 4.2 percent of GDP in 2011-12. The share of net services exports averaged 1.41 per cent of India's GDP at Market Prices during the entire post-reform period, whereas the share of net merchandise exports in India's GDP averaged -3.49 per cent. The share of net services exports in India's GDP crossed 1 per cent in 2003-04 and has increased ever since, signifying the growing importance of services trade in India's economic growth during the past one decade. The share of net services exports in India's GDP reached a peak of 4.41 per cent in 2008-09, during the peak of the global economic recession. This can be attributed to the spectacular growth witnessed in India's net exports of miscellaneous services in 2008-09, as already noted earlier. Although the share of net services exports in India's GDP declined in the following two years due to the slowdown in global demand, it recovered again in 2011-12. This empirical analysis points to the potential for services trade to become an engine of export-led growth for the Indian economy in the coming years.

Table 2: Percentage Share of Different Components in India's GDP at Market Prices

| Year | Final Consumption Expenditure (PFCE+GFCE) | Gross Capital Formation | Merchandise (X-M) | Services (X-M) |
|----------------|---|-------------------------|-------------------|----------------|
| 1990-91 | 78.87 | 24.80 | -1.68 | 0.30 |
| 1991-92 | 79.03 | 22.56 | -0.46 | 0.46 |
| 1992-93 | 77.51 | 24.40 | -1.08 | 0.35 |
| 1993-94 | 77.38 | 21.77 | -0.17 | 0.19 |
| 1994-95 | 75.95 | 24.14 | -0.48 | 0.18 |
| 1995-96 | 74.94 | 27.29 | -1.10 | -0.06 |
| 1996-97 | 75.96 | 22.70 | -1.32 | 0.18 |
| 1997-98 | 75.57 | 24.52 | -1.53 | 0.31 |
| 1998-99 | 77.33 | 23.22 | -2.14 | 0.51 |
| 1999-00 | 78.09 | 26.75 | -2.77 | 0.88 |
| 2000-01 | 77.17 | 24.75 | -1.26 | 0.36 |
| 2001-02 | 77.69 | 24.79 | -1.54 | 0.68 |
| 2002-03 | 75.94 | 25.83 | -1.66 | 0.70 |
| 2003-04 | 73.87 | 27.48 | -2.32 | 1.63 |
| 2004-05 | 70.08 | 32.45 | -3.88 | 2.12 |
| 2005-06 | 69.16 | 34.28 | -5.52 | 2.78 |
| 2006-07 | 67.99 | 35.87 | -6.26 | 3.10 |
| 2007-08 | 67.25 | 38.03 | -7.15 | 3.13 |
| 2008-09 | 68.64 | 35.53 | -9.48 | 4.41 |
| 2009-10 | 69.36 | 36.41 | -8.02 | 2.63 |
| 2010-11 | 68.29 | 37.56 | -7.04 | 2.61 |
| 2011-12 | 68.87 | 35.92 | -10.01 | 3.48 |
| Average | 73.86 | 28.68 | -3.49 | 1.41 |

Source: Author's calculations based on data from National Account Statistics, CSO

3. Decomposition of the contribution of other invisibles to growth in India's national disposable income

Studying the contribution of other invisibles (except net exports of non-factor services) towards economic growth poses a methodological problem since GDP does not include remittances, compensation of employees or investment income. However, as per to national income accounting (NIA), net national disposable income (NNDI) is the sum of (i) net domestic product (NDP) at market prices (ii) net factor income from abroad and (iii) other current transfers from rest of world (net). It needs to be noted here that "net factor income from abroad" in NIA is the sum of "compensation of employees (net)" and "investment income (net)" in the balance of payments. Similarly, "other current transfers from rest of the world" in NIA is the same as private transfers/remittances in balance of payments. Therefore, it is possible to quantify the contribution of these invisibles towards the growth in India's national disposable income. For this decomposition analysis, annual data on the relevant variables published in National Account Statistics (base year: 2004-05), at current prices (in ₹ crore), is utilised. Accordingly, the growth rate of India's NNDI (\hat{Y}) is decomposed into the sum of (i) the share-weighted growth rate of India's NDP at market prices, $w_1\hat{Y}_1$ (ii) the share-weighted growth rate of net factor income (NFI) from abroad, $w_2\hat{Y}_2$ and (iii) the share-weighted growth rate of other current transfers (net) from rest of the world, $w_3\hat{Y}_3$. The weights w_1 , w_2 and w_3 in equation (1) give the respective shares of the three components in India's total NNDI.

$$\hat{Y} = w_1\hat{Y}_1 + w_2\hat{Y}_2 + w_3\hat{Y}_3 \quad \dots\dots\dots (1)$$

Where $w_1+w_2+w_3 = 1$

Table 3: Decomposition Analysis of India's National Disposable Income

| Year | Share-weighted growth rate of NDP at Market Prices ($w_1\hat{Y}_1$) | Share-weighted growth rate of NFI from abroad ($w_2\hat{Y}_2$) | Share-weighted growth rate of Remittances (net) from Rest of the World ($w_3\hat{Y}_3$) | Growth rate of India's Net National Disposable Income (\hat{Y}) | Contribution of Remittances to Growth in NNDI ($w_3\hat{Y}_3 / w_1\hat{Y}_1 + w_2\hat{Y}_2 + w_3\hat{Y}_3$)* 100 | Contribution of NFI from abroad to Growth in NNDI ($w_2\hat{Y}_2 / w_1\hat{Y}_1 + w_2\hat{Y}_2 + w_3\hat{Y}_3$)* 100 |
|---------|---|--|---|---|--|--|
| 1991-92 | 14.03 | -0.34 | 4.58 | 18.27 | 25.09 | -1.84 |
| 1992-93 | 14.49 | -0.16 | 0.59 | 14.93 | 3.95 | -1.04 |
| 1993-94 | 15.04 | -0.04 | 1.41 | 16.42 | 8.61 | -0.23 |
| 1994-95 | 17.11 | -0.08 | 1.62 | 18.64 | 8.68 | -0.45 |
| 1995-96 | 16.87 | -0.03 | -0.39 | 16.45 | -2.37 | -0.19 |
| 1996-97 | 15.37 | 0.03 | 2.97 | 18.37 | 16.14 | 0.16 |
| 1997-98 | 10.44 | -0.01 | -0.01 | 10.42 | -0.13 | -0.09 |
| 1998-99 | 14.56 | -0.13 | -0.04 | 14.39 | -0.25 | -0.93 |
| 1999-00 | 11.20 | -0.03 | 0.69 | 11.86 | 5.79 | -0.26 |
| 2000-01 | 7.19 | -0.47 | 0.32 | 7.04 | 4.56 | -6.73 |
| 2001-02 | 7.74 | 0.12 | 0.74 | 8.60 | 8.63 | 1.36 |
| 2002-03 | 7.33 | 0.17 | 0.24 | 7.74 | 3.09 | 2.17 |
| 2003-04 | 12.03 | -0.09 | 0.97 | 12.91 | 7.51 | -0.72 |

| | | | | | | |
|----------------|--------------|--------------|-------------|-------------|------------|--------------|
| 2004-05 | 17.73 | -0.23 | -0.37 | 17.14 | -2.15 | -1.32 |
| 2005-06 | 13.66 | -0.17 | 0.54 | 14.03 | 3.86 | -1.19 |
| 2006-07 | 16.08 | -0.27 | 0.72 | 16.53 | 4.35 | -1.65 |
| 2007-08 | 15.84 | 0.38 | 0.73 | 16.95 | 4.32 | 2.26 |
| 2008-09 | 12.24 | -0.61 | 0.64 | 12.28 | 5.21 | -4.93 |
| 2009-10 | 14.21 | -0.15 | 0.63 | 14.69 | 4.28 | -1.03 |
| 2010-11 | 18.95 | -1.08 | -0.05 | 17.82 | -0.26 | -6.07 |
| 2011-12 | 16.67 | 0.03 | 0.78 | 17.48 | 4.46 | 0.15 |
| Average | 13.75 | -0.15 | 0.82 | 14.4 | 5.4 | -1.07 |

Source: Author's calculations based on data from National Account Statistics, CSO

The average share of NDP at Market Prices in India's NNDI is found to be $w_1 = 0.98$; the average share of "net factor income from abroad" in India's NNDI is found to be $w_2 = -0.01$; and the average share of "other current transfers (net) from rest of the world" in India's NNDI is found to be $w_3 = 0.03$. The annual growth rates of these three components ($\hat{Y}_1, \hat{Y}_2, \hat{Y}_3$) are also computed.

Table 3 reports the results of the decomposition analysis. The growth rate of India's Net National Disposable Income is found to average 14.4 per cent during the study-period. It is found that growth in remittances is the only component among "other invisibles" that has contributed to the growth in country's national disposable income during the post-reform period. The contribution of remittances to growth in NNDI remained below 10 per cent during most of the years, except in 1991-92 and 1996-97. The impressive contribution of remittances to the extent of 25 per cent in 1991-92 can mostly be attributed to the great surge in remittances after India's 1990-91 balance of payment crisis. The contribution of remittances to growth in NNDI averaged 5.4 per cent during the study period. The contribution of net factor income from abroad (i.e., investment income + compensation of employees) to growth in NNDI remained negligible and negative during most of the study-period, and exceeded 1 per cent during 2001-02, 2002-03 and 2007-08. The contribution of remittances to growth in NNDI also turned negative during five years, over the time-span of this study. Most of the growth in NNDI during the post-reform period can be attributed to the growth in Net Domestic Product at market prices.

4. Estimation of the Relationship between Services Trade, Economic Growth and Current Account Balance for Indian Economy

The macroeconomic variables, current account balance (CAB), GDP at market prices (GDPMP), and net services exports (NSX) are initially examined for their unit-root properties. The results of the ADF test and KPSS test are reported in Tables A1 and A2, in the Appendix. All three variables are found to be I (1), i.e., integrated of order 1. This implies that the data series is non-stationary at levels, and becomes stationary only at first difference. From the literature review, economic growth and services trade are found to influence the behaviour of the current account balance. Therefore, the bound-testing approach to ARDL model is used to study the long-run relationship among these variables. One significant advantage of this approach over other co-integration techniques is that different variables can be assigned different lag-lengths in the ARDL model. The model is specified in the linear form since

it is not possible to derive the logarithmic form for CAB and net services exports (NSX), because these variables take on both positive as well as negative values.

$$\Delta CAB_t = \alpha + \sum_{i=1}^m \beta_{1i} \Delta CAB_{t-i} + \sum_{i=0}^n \beta_{2i} \Delta GDPMP_{t-i} + \sum_{i=0}^p \beta_{3i} \Delta NSX_{t-i} + \beta_4 CAB_{t-1} + \beta_5 GDPMP_{t-1} + \beta_6 NSX_{t-1} + u_t \quad \dots\dots\dots (2)$$

The existence of a co-integrated relationship between the variables in the ARDL model specified in equation (2) is examined with the help of F or Wald test statistics. Wald test examines the joint null hypothesis of zero co-integration between the variables ($H_0: \beta_4=\beta_5=\beta_6=0$), against the alternate hypothesis of presence of co-integration. The calculated F-statistics is compared with two sets of critical values computed by Pesaran *et al* (2001) for a given level of significance, in their bound testing approach to the analysis of long-run relationships. If the computed F-statistic exceeds the upper critical bound value, it implies that the null hypothesis of zero co-integration can be rejected. If the computed F-statistic falls below the lower critical bounds value, it implies that the null hypothesis of zero co-integration cannot be rejected. However, if the calculated F-statistic lies within the bounds, then the test becomes inconclusive.

Table 4: Long-run Coefficients Estimated from ARDL (1,2,3) Model

| Dependent Variable is CAB | | |
|---------------------------|-------------|----------------|
| Regressor | Coefficient | T-Ratio[Prob.] |
| GDPMP | -0.08*** | -2.94[.005] |
| NSX | 0.27 | .48[.636] |
| C | 426.81*** | 3.16[.003] |

Source: Author’s calculations

***, **, * denotes statistical significance at the 1%, 5% and 10% level of significance, respectively.

Table A3 in the Appendix gives the estimation results of ARDL (1,2,3) model, chosen based on Schwarz Bayesian Criterion (SBC). When the Wald test is performed for this model, the F statistic is found to be 4.62 and is statistically significant. The Wald test results are given in Table A4 in the Appendix. Assuming a model with unrestricted intercept and no trend, and with 2 regressors (k=2), the lower and upper bound values of F-statistic from Pesaran *et al* (2001) are [3.17, 4.14] at the 10 per cent level of significance, and [3.79, 4.85] at the 5 per cent level of significance. The computed F statistic is found to exceed the critical upper bound value at the 10% significance level, and fall within the bounds at the 5 % significance level. Hence, the null hypothesis of zero co-integration can be rejected at the 10 per cent level of significance. This establishes the presence of a long-run equilibrium relationship between current account balance, GDP and net services exports for the Indian economy, during the post-reform period. Further, Table 4 gives long-run coefficients derived from the ARDL (1,2,3) Model. The long-run coefficient for GDP (-0.08) is found to be negative and statistically significant, implying that an increase in India’s GDP leads to a deterioration in CAB in the long-run. This

implies that India still has not reached the stage of a developed economy, wherein the needs of economic growth do not take a toll on the country's CAB. The long-run coefficient for net services exports (0.27) is found to be positive but statistically insignificant. This is in consonance with the findings of Mann (2004) for the US economy. It implies that an increase in net services exports leads to an improvement in India's CAB in the long run, although the impact is insignificant, which can be attributed to the over-arching merchandise trade deficit of the Indian economy.

The Granger Representation Theorem states that if a set of variables are co-integrated, then there exists a valid error correction representation of the data. Error Correction Representation of the chosen ARDL (1,2,3) Model gives the short-run dynamics, and estimation results are reported in Table 5. The error correction term (ECT) = -0.53 is found to be negative and statistically significant at the 1 per cent level of significance, providing further econometric evidence of the presence of a co-integrated relationship among the variables. In the short-run, an increase in GDP is found to improve India's CAB, after a time-lag of one quarter, as implied by the positive and statistically significant short-run coefficient. Similarly, an increase in net Services Exports is found to improve India's CAB, after a time-lag of two quarters, as implied by the positive and statistically significant short-run coefficient. A key assumption in the bound-testing methodology is that the errors of the estimated ARDL model must be serially independent. Hence, regression diagnostic tests are performed on the estimated model and the test results are reported in Table A5, in the Appendix. It is found that the estimated ARDL model neither suffers from autocorrelation, heteroscedasticity, non-normality or specification error.

Table 5: Error Correction Representation for the ARDL(1,2,3) Model

| Dependent variable is dCAB | | |
|----------------------------|-------------|----------------|
| Regressor | Coefficient | T-Ratio[Prob.] |
| dGDPMP | .02 | .73365[.466] |
| dGDPMP1 | .11*** | 3.9841[.000] |
| dNSX | .18 | .58876[.559] |
| dNSX1 | -.25 | -.73782[.464] |
| dNSX2 | .57* | 1.8350[.072] |
| dC | 225.71*** | 2.8581[.006] |
| ECT(-1) | -.53*** | -4.0990[.000] |

Source: Author's calculations

***, **, * denotes statistical significance at the 1 %, 5% and 10% level of significance, respectively.

Conclusion and Implications

The quantum, quality and financing of CAD have emerged as a major concern for Indian policy-makers after the recent global recession, as they faced a gloomy macro-economic scenario of decelerating growth, capital exit from stock markets and significant rupee depreciation. The IMF's approach to

external stabilisation often involves a reduction in CAD by introducing painful structural adjustment measures such as deep cuts in domestic investment, which is not a good recipe for economic growth. Moreover, gold and oil imports, which largely account for India's burgeoning CAD, are relatively inelastic to income changes. In this context, this paper finds the existence of a long-run equilibrium relationship between net services exports, GDP and current account balance in the Indian economy during the post-reform period. This paper also finds empirical evidence indicating that private transfers are more crisis-prone compared to net services exports, in case of Indian economy. Hence, this paper argues for a bigger role for net services exports (rather than remittances), in bringing down India's CAD. Moreover, some of the remittances are likely to filter out of the economy via higher imports of goods and services. Therefore, the net impact on the current account balance maybe much smaller than the actual flow of remittances. However, the significant contribution of remittances to the growth in India's national disposable income is duly noted in this study. Although India is a significant player in the world market for services, most of the international trade in services still takes place between developed countries. Adopting policies that promote and diversify India's services exports as well as export markets, and raise India's export competitiveness in the world services market is a much better recipe for India's external stabilisation.

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APPENDIX

Table A1: Testing for Stationarity - ADF test

| Variable | Test statistic | Test statistic | Test statistic | Test statistic |
|--------------|----------------------|----------------------|--------------------|--------------------|
| | (level of variables) | (level of variables) | (First Difference) | (First difference) |
| | Intercept | Intercept + trend | Intercept | Intercept + trend |
| GDPMP | 3.34 | 1.796 | -4.27*** | -20.7*** |
| CAB | 1.72 | 0.127 | -8.12*** | -8.78*** |
| NSX | 0.0028 | -2.517 | -9.15*** | -9.33*** |

Source: Author's calculations

***The **null hypothesis** that the variable concerned is **non-stationary** can be rejected at 1% level of significance.

Table A2: Testing for Stationarity - KPSS test

| variable | Test statistic | Test statistic | Test statistic | Test statistic |
|--------------|----------------------|----------------------|--------------------|--------------------|
| | (level of variables) | (level of variables) | (First difference) | (First difference) |
| | Intercept | Intercept + trend | Intercept | Intercept + trend |
| GDPMP | 0.95*** | 0.25*** | 0.38 | 0.14 |
| CAB | 0.79*** | 0.28*** | 0.402 | 0.14 |
| NSX | 0.96*** | 0.23*** | 0.33 | 0.08 |

Source: Author's calculations

***The **null hypothesis** that the variable concerned is **stationary** can be rejected at 1% level of significance.

Table A3: ARDL (1, 2, 3) Model Estimation Results

| Dependent Variable is CAB | | |
|---------------------------------|-------------|-------------------------------------|
| Regressor | Coefficient | T-Ratio[Prob] |
| CA (-1) | .47117*** | 3.6521[.001] |
| GDPMP | .022533 | .73365[.467] |
| GDPMP (-1) | .046950 | 1.2119[.231] |
| GDPMP (-2) | -.11080*** | -3.9841[.000] |
| NSX | .17857 | .58876[.559] |
| NSX (-1) | -.27117 | -.76085[.450] |
| NSX (-2) | .80501** | 2.2376[.030] |
| NSX (-3) | -.56954* | -1.8350[.072] |
| C | 225.7095*** | 2.8581[.006] |
| R-Squared: 0.79 | | R-Bar-Squared: 0.75 |
| S.E. of Regression: 152.43 | | F-stat. F (8, 51): 23.46 [0.000] |
| Akaike Info. Criterion: -390.86 | | Schwarz Bayesian Criterion: -400.29 |
| DW-statistic: 2.01 | | |

Source: Author's calculations

Note: Lag-length is chosen on the basis of SBC

***, **, * denotes statistical significance at the 1 %, 5% and 10% level of significance, respectively.

Table A4: Wald Test Results for ARDL (1,2,3) Model

| Test Statistic | Value | df | Probability |
|----------------|----------|---------|-------------|
| F-statistic | 4.62*** | (3, 48) | 0.0064 |
| Chi-square | 13.86*** | 3 | 0.0031 |

Source: Author's calculations

***, **, * denotes statistical significance at the 1 %, 5% and 10% level of significance, respectively.

Table A5: Regression Diagnostic Tests for ARDL Model

| Diagnostic Tests | Null H ₀ | LM Version | F Version |
|--------------------------|--|-------------------------|-------------------------|
| Lagrange Multiplier test | zero serial correlation | CHSQ(4)= 2.9691 [0.563] | F(4,47)= .61171 [0.656] |
| Jarque Bera test | Normality (normally distributed residuals) | CHSQ(2)= 3.1559 [0.206] | Not applicable |
| White test | Homoskedasticity | CHSQ(1)= 1.7402 [0.187] | F(1,58)= 1.7325 [0.193] |
| Ramsey's RESET test | Model is correctly specified. | CHSQ(1)= 1.6903 [0.194] | F(1,50)= 1.4494 [0.234] |

Source: Author's calculations

***, **, * denote Null Hypothesis can be rejected at 1%, 5% and 10% level of significance, respectively.

Figures in parenthesis [] are probability values.

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Price: ₹ 30.00

ISBN 978-81-7791-196-1



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