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DO REMITTANCES IMPACT THE ECONOMY? SOME EMPIRICAL EVIDENCES FROM A DEVELOPING ECONOMY

Hrushikesh Mallick

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ABSTRACT

The study attempts to examine the impact of remittances on macroeconomic activities (private consumption and investment) and its implications on economic growth in India for the period from 1966-67 to 2003-04. Estimating a general consumption model, the results indicate that remittances along with debt, money supply (net of bank demand deposits) and income, consistently have a positive influence on private consumption. This suggests that as usually the case for a developing economy, the effect of remittances is not different from that of income, indicating income effect of remittances. The result also implies that government debt is perceived as net wealth by the private sector. With the increase in public debt, private sector perceives that their wealth is also getting increased and as a result they tend to spend more on consumption ignoring its implications in terms of future tax burden that they have to incur. Further, examining the impact of remittances on private investment and output growth, the study finds that although remittances do adversely affect private investment but the growth rate of remittances do not influence on the growth rate of output in the economy. This is something quite puzzling. However, on the basis of no growth effect of remittances, the study suggests that the government policy should be designed towards inducing the private sector to allocate more for productive investments for leveling up the rate of growth. Otherwise significant a proportion of remittances would result in increases in private consumption without any contributory impact on the economy.

Key Words: Remittances, consumption, Investment, Growth, Interest Rates, Government Borrowings & Openness of the Economy

JEL Code: E22, E24, E43, E51, H62, H63 & O11

Introduction

The economic power of migrants' remittances[1], as a source of capital and support, affects millions of households around the world. Remittances play an increasingly significant role in many economies, by influencing their economic activities.[2] Broadly there are two strands of theoretical literature on remittances. One is based on the altruistic motive and the other one on self-interest theory of remittance. Migrants send money back home either for households' maintenance expenditure or for investing on profitable ventures. Depending upon the nature of remittances and the economic conditions characterizing the remittance-receiving economics, remittances affect consumption and investment decisions in receiving economies. Migrants sending money home for family maintenance is based upon altruistic motives as their total utility depends on their own level of consumption as well as consumption of their household members. Thus, family ties in the form of mutual caring, are important motivations of remitting funds from abroad (Chami et al, 2005). Remittances sent by emigrant workers to support their household members left behind are especially an important source of financial support for many families in the developing world. They directly exert significant influence on the standard of living of the receiving households. The amounts are spent on education, health and household consumption or in various forms of human capital formation. In contrast, while households invest the remittances on real estate or physical capital, they do so with profit motive, and conform to the self-interest theory of remittances[3].

Apart from remittances improving the standard of living and generating human capital in the receiving country, they also produce indirect impacts on the local economies. They generate employment opportunities and thereby influence private consumption. Influence on consumption could also lead to economic growth as consumption creates investment demand through its multiplier effect. It is seen that while a very large proportion of remittances is being spent on consumption, a very small proportion is also saved or used for productive investments. Thus, some proportion gets invested in livestock and business. Remittances are also used for other purposes such as repayment of debts, funeral assistance, and membership and subscription fees of burial societies and payment of wages to workers. There takes place very little investment in productive activities. Some authors attribute the bias towards consumption; to the unavailability of banking facilities in rural areas and limited investment opportunities to most of the remittance-receiving families. Further, this could happen because remittances have not received sustained attention of governments in countries of origin, of international financial institutions and of the private sector. This is particularly the case with informal remittances as the magnitude of unrecorded remittances and their economic implications have drawn less attention than formal remittances. This is the reason why the policy options for enhancing the impact of remittances on receiving households and communities have generally excluded informal remittances.

The endogenous migration approach is based on altruistic motive, but it is different from the portfolio approach (Chami et al, 2005). The former is based on economies of family and altruistic behaviour. It describes the economic situation facing the migrants and the family, while the latter isolates the decision to remit from the decision to migrate, and thus avoids issues of family ties. The migrant earns income and decides how to allocate his savings between host country and home country assets. Remittances are a result of deciding to invest in home country assets.[4] This assumption supports the view that remittances are

like other capital flows. The length of the migrant's stay in the host country is believed to weaken the desire to remit because the migrant comes to regard herself more and more as a permanent migrant who has formed her own independent household. In the portfolio view, the rates of return on various assets or return differentials, determine the decision to remit funds. The variables used in this framework include interest rate differentials on comparable deposit accounts offered in the host and home (labour-sending) countries, interest rate incentives offered on home country deposits, black market exchange premium (if any), the return on real estate in the home country, inflation rates, and other factors. The degree of economic development (level of income per capita) and macroeconomic stability in the country of origin are the other key factors determining incentives to remit part of the income earned abroad. In addition, political risk and uncertainty also affect the decision to remit.

Remittances represent the most direct, immediate and far-reaching benefits to migrants and their countries of origin. They have been a constant source of income to developing economies as compared to other private flows and foreign direct investment (FDI). Remittances are now second only to foreign direct investment, by way of capital flows to developing economies. The study takes the perspective of remittances as a critical source of capital and resources that have impacted and would probably continue to impact on the development of millions of households in developing economies. With resources for development finance dwindling, remittances are emerging as a new tool and strategy for uplifting the economic conditions of developing countries. It has been recognised that the increments on fiscal spending have been inadequate to fulfill the needs of wide segments of society. Remittances help in addressing the most basic needs of the migrants' families and their communities. Remittances represent a significant flow of income to poor families. If remittances could be channeled into more efficient ways, it would considerably contribute to alleviation of poverty and speed up the economic development. Therefore, the challenge before

developing economies is to transform the potential of remittances into a sustainable input in poverty eradication and development efforts. Thus, it can influence consumption and saving decisions and thereby the economic growth.

The World Bank official estimates show that migrants from developing country residents in developed countries sent home more than $ 223 billion to their families in developing countries in 2005; the corresponding amount was US $ 58 billion in 1995 and US $ 160 billion in 2004. The 2005 figure is more than twice the size of total international aid. Remittance inflows have become an important source of financing current account deficits, in many countries including India. Remittances are equivalent to about 6.7 percent of developing countries' imports and 7.5 percent of their domestic investment, indicating the significance of these inflows for the host economies. Remittances were even larger than total capital inflows in many developing countries in 2004 and exceeded the value of their merchandise exports.

Remittances influences macro activities. The overall economic impact of remittances depends in part on the propensity of the recipient households to consume and invest. Remittances that are invested in productive activities directly contribute to output growth. Even remittances that are consumed may also have positive multiplier effects on the economy. On the one hand, they reduce poverty and increase foreign currency reserves, and on the other hand, improve the investment climate, in the recipient country. There is a substantial positive effect on the receiving households in terms of improved standard of living, with a knock-on effect for the local economy. However, both the macro-economic impacts as well as the contributions to household well-being, may also produce the effect of delayed government reforms meant to restructure policies to tackle underlying disturbances. Therefore, although it is argued that remittances contribute to strengthening the balance of payments by adding foreign exchange reserves (Djajic, 1986; Taylor, 1999) and offsetting the trade

deficits (by financing imports), they are also seen to contribute little to economic growth[5]. It is also argued that if remittances are used primarily to purchase non-tradable goods, exchange rates could appreciate and thereby jeopardizing the export competitiveness and, in effect, results in remittance-driven "Dutch Disease".

Consumption gets affected in various ways due to the inflow of remittances which, in turn, translates into affecting other macroeconomic activities. Consumption has a clear follow-on effect of improvement in standard of living and educational opportunities for the receiving households. Consumption, purchase of land and other physical assets, and investment, also constitute contributions to the local economies. It is seen that remittance-receiving households tend to be better off (e.g. with higher average income and assets) than households that do not receive remittances. Transfers tend to flow from relatively rich to relatively poor households, mostly from children to parents (in contrast to an inverse flow in industrialised countries). Remittance receiving households in less developed regions spend higher proportions on daily expenses or consumptions than households in developed regions. Higher proportion going to consumption is in conformity with the fact that remittances constitute part of a livelihood and poverty-reduction strategy of individual migrants and their families. It is against this backdrop that this paper aims at empirically examining the impact of remittances flows on aggregate economic activities in India since the impact of remittances flows on recipient economies is understood to have wide policy implications.

Remittance Inflow into India

The upsurge of workers' remittances to India, following the oil boom in the Middle East, during the 1970s and the 1980s, and the information technology revolution of the 1990s, have placed India as one of the highest remittance-receiving countries in the world. Remittances include repatriation of funds for family maintenance and

local withdrawals from Non-resident Indian (NRI) deposits. Inward remittances from Indians working abroad surged from US $ 2.1 billion in 1990-91 to US $ 24.6 billion in 2005-06[6], thereby, proving to be a source of stable support to India's balance of payments. The Gulf region continues to be an important source of overseas employment for Indians. An estimated 3.8 million Indians working in the Gulf remitted about $ 6 billion to India in 1999-00. Indian Muslims brought in over $ 2.6 billion from Saudi Arabia alone and if one combines with it the amounts repatriated from other middleastern countries, the amount Indian Muslims bring would be stupendously high.[7]

India has reported a spectacular rise in remittance inflows from $ 13 billion in 2001 to more than $ 20 billion in 2003. Several factors account for this remarkable increase. First, the number of emigrants has grown sharply. During the oil boom in the 1970s and the 1980s, thousands of low skilled Indian workers migrated to the Persian Gulf countries. In the 1990s, migration to Australia, Canada, and the United States increased significantly, particularly of information technology (IT) workers, on temporary work permits. Secondly, the swelling of migrants' coincided with (a) better incentives to send and invest money in India's growing economy and (b) an easing of the regulations and controls, flexible exchange rates, and gradual opening up of the capital account in the balance of payments. The elimination of the black-market premium for the Indian rupee and convenient remittance services provided by Indian and international banks have undoubtedly shifted some remittances flows from informal hawala channels to formal channels. Workers' remittances remained buoyant during 2005-06 benefiting from robust growth of global output and constant improvement in the domestic infrastructure for transacting remittances. Strong growth in oil-exporting countries consequent on the surge in international crude oil prices also provided support to private remittances. India continues to be one of the highest remittance-receiving developing countries in the world. The figures in Table 1 indicate on the recent trends in the magnitude of remittances

flows into India. The remittances reported by IMF significantly differ from the RBI reports. Remittances exceed the capital flows in almost all of the reporting periods. They constitute a significant amount of exports and imports filling a large volume of trade deficits in India.

Table 1: Trends in Inflows of Remittances in India

	Private Transfers/ GDP	Remit-tances/ GDP	Direct Invest-ment/ GDP	Portfolio Invest-ment/ GDP	Remit-tances/ Exports	Remit tances / Imports	Remit tances/ Trade Deficits
	1	2	3	4	5	6	7
1990-91	0.00	0.78	0.03	0.00	13.48	8.92	-26.38
1991-92	0.00	1.21	0.05	0.00	17.63	15.41	-121.99
1992-93	0.00	1.15	0.13	0.10	15.83	12.04	-50.30
1993-94	0.00	1.18	0.21	1.32	14.39	12.20	-80.44
1994-95	0.00	1.70	0.42	1.11	20.50	15.33	-60.83
1995-96	0.00	1.63	0.61	0.76	17.90	13.25	-51.01
1996-97	0.00	2.12	0.73	0.85	24.10	16.81	-55.57
1997-98	0.00	2.47	0.86	0.44	28.48	19.84	-65.38
1998-99	0.00	2.27	0.59	-0.01	27.48	19.86	-71.56
1999-00	0.00	2.48	0.48	0.67	29.71	20.14	-62.52
2000-01	0.00	2.91	0.88	0.60	29.40	23.10	-107.71
2001-02	0.00	3.14	1.28	0.42	33.59	26.71	-130.38
2002-03	0.00	3.34	0.99	0.19	31.49	26.27	-158.42
2003-04	0.00	3.71	0.72	1.88	33.66	27.85	-161.41
2004-05	0.00	2.91	0.86	1.32	24.01	17.18	-60.41
2005-06	0.00	2.80	0.95	1.55	21.52	14.42	-43.68
2006-07	0.00	2.95	2.12	0.76	21.27	14.08	-41.63

Sources: The statistics on remittances are sourced from IMF while private
transfers are sourced from RBI along with other indicators.

Inflow of remittances has offset India's trade deficit to a large extent, thus enabling it to keep its current account deficits at modest levels in the 1990s. The sustained expansion of remittances since the 1990s has been underpinned by structural reforms including the switch-over to market-based exchange rates and current account convertibility, as well as by a shift in the pattern of labour outflow from semi-skilled workers increasingly to high-skilled categories of professionals and technicians. Policy initiatives have facilitated remittance flows through speedier and more cost-effective money transfer arrangements like banking channels; money transfer agencies and post offices have also contributed to stable and sustained rise in remittances. While banking channels account for the bulk of inward remittances to India, the Money Transfer Service Scheme (MTSS) and the Rupee Drawing Arrangements (RDA) are also assuming increasing significance. These schemes provide benefits of easier and speedier services and play a crucial role in expanding the outreach of remittance services to remote locations in the country.

Non-resident Indians have also responded to several attractive deposit schemes and bonds offered by the government of India. These schemes offer attractive interest rates and an appreciating rupee. While non-resident deposits are conceptually different from remittances (they are liability items in the capital account), evidence suggests that a large part of such deposits is converted into local currency. For example, in the case of the Resurgent India Bond that matured in 2003, most of the redemption value stayed in India to meet various local currency needs of the non-resident depositors and their households. Nevertheless, remittances in the form of foreign currency deposits may become speculative and may lead to reverse flows to the rest of the world in the event of deterioration in the investment sentiment. India's liberalization of the exchange rate in 1991 has been linked to a decline in the use of illegal transfer channels to the state of Kerala (Global Economic Prospectus, 2006).

The central bank is facing difficulties in controlling the reserves, because in order to meet the demand for domestic currency it has to purchase increasing amounts of foreign exchange, much of which stems from remittances and foreign direct and institutional investments. The large flow of remittances is partly responsible for the appreciating rupee against the US dollar in some periods. The economy is showing signs of robust growth of GDP resulting from an expanding service sector and good performance of the industrial sector. The authorities are however lately facing difficulties in containing the inflation. The impact of remittances on the exchange rate has been ambiguous; strong appreciation pressures that emerged in early 2004 and 2007 could have been the result of inappropriate monetary management that tried to constrain cash in circulation, rather than a result of inflow of remittances. At the same time, during most of the period in 2004-2005, the foreign exchange market seemed to be close to its equilibrium and only some nominal depreciation of the exchange rate was experienced. Therefore, in India the impact of remittances through the monetary channel has so far translated mainly into additional inflationary pressures rather than into real growth. The inflationary impact has not been pronouncing and it has only affected land and real estate prices and private sector wages severely.

It is argued that remittances substitute for lack of financial development in developing economies and thereby, promoting their economic growth. They constitute a significant proportion of total capital flows. In an economy in which the financial system does not work/weak, remittances provide entrepreneurs who lack collateral, credit and serve as an instrument to start high-return projects. Therefore, remittances help alleviate credit constraints on the poor, substituting for financial development and improving allocation of capital, and thereby accelerating economic growth. Remittances are private flows of foreign exchange/capital transfers which are different from other types of capital flows[8] such as foreign direct investment and foreign institutional

investment. However, a considerable amount of literature argues that a significant proportion of remittances is spent on private consumption and only a small part is allocated for investment, thereby, suppressing the long run growth potential of the economy.

Impact of Remittance on Private Consumption, Private Investment and Growth

Remittances from expatriate workers represent a substantial flow of funds, predominantly from developed to developing economies.[9] In contrast to the view that remittances would have a positive correlation with output growth if they are like capital flows, many of the studies confirm that remittances are counter-cyclical and compensatory transfers. The compensatory nature[10] of remittances presents a moral hazard or dependency syndrome that could impede economic growth as recipients reduce their participation in productive endeavours. These results imply that remittances do not act like sources of capital for economic development. Some studies strongly suggest that remittances create lasting negative effects on the country of origin.[11] A large body of relevant literature argues that remittances have mostly been used for excessive consumption, housing, and land, and are not used for increasing productive capacity or investment that contributes to long-run growth (Giuliano and Ruiz-Arranz, 2005). However, as seen above, some researchers argue that consumption behaviour may have a multiplier impact and may trigger investment demand and economic growth. The argument reinforces that remittances whether spent on consumption or investment, could lead to higher national income. In this context, the focus of the present discussion is to highlight the direct impact of remittances on private consumption, investment and growth in developing countries.

The economic consequences of remittances are hard to disentangle. They may affect growth through a variety of channels. Lucas (2005) disentangles the discussion on the impact of remittances into two aspects:

the effects on poverty and inequality; and the influences on investment, growth and macro-economic stability. Although economic consequences of remittances and the manner, in which they influence savings within the framework of exogenous growth models, are uncertain, the effect of an increase in the saving rate is to increase the level of per capita capital stock. Therefore, per capita output is important but it requires careful and intricate analysis to build up models which can be used for empirical and estimable investigation. Such an exercise seems not to have been attempted in the literature. Nevertheless, there exists significant empirical evidences, pointing out that remittances lead to positive economic growth, be it through increased consumption, savings or investment. For instance, Adams (2002) from a household survey in Pakistan found that in the later 1980s and the early 1990s, the marginal propensity to save was higher (0.71) for incomes accruing from international remittances than for incomes arising from domestic urban-rural remittances (0.49) or rental incomes (0.08). This evidence supports the view that inward remittances have a favourable impact on savings and investment (Rath, 2003). Lucas cites several case studies which show that remittances have accelerated investment in Morocoo, Pakistan and India. Glytsos (2002) models the direct and indirect effects of remittances on incomes and hence on investment in seven Mediterranean countries, and finds that investment rises with remittances in six out of these seven countries. Further, an analysis conducted by Leon-Ledesma and Piracha (2004) supports the view that remittances have had a positive impact on productivity and employment through acceleration of level of investment, in eleven transition economies of Eastern Europe, during 1990-99. A study by Roberts et al. (2004) on remittances made in the context of Armenia suggests that the propensity to save out of remittance income is as higher as almost 40% and remarkably consistent. Further, Desai et al. (2003) indicate that additional consumption increases indirect tax receipts, thus increasing government consumption or savings. Thus, there is overwhelming evidence to show that remittances have enabled

to attain high rates of economic growth through boosting up the rates of investment and raising income levels by way of multiplier effects of consumption, which go beyond the remittances-receiving households. Thus, remittances tend to influence private consumption and investment through their growth impulses.

Yet, substantive debates are on over the extent to which remittances actually boost up the economy of the source country, since a large part of the income is used for consumption and not saved or invested (Drinkwater et. al, 2002). Recent strands of literature, however, indicate that remittances could lead to economic growth, simply by increasing emigrants' household incomes, regardless of whether the additional income is spent on consumption or savings. For example, Ratha (2004) indicated that if remittances are invested, they contribute to output growth, and generate positive multiplier effect even if they are consumed. Further, one should also examine whether families with incomes augmented by remittances save more, recognizing the fact that spending on education, housing, and land are forms of investment and that an investment by one family may or may not constitute an investment for the country as a whole. The question arises as to how the recipients of remittances spend the income. Taylor (1999) also finds that the most important impact of remittances by migrants may not be felt in the households that send migrants abroad and receive remittances from them. High levels of consumption (as opposed to investment) spending by remittance-receiving households may result in a positive impact on productive investment in migrant-sending areas, provided that this consumption demand leads to investment by other households or firms.

Remittances might also compensate for a fragile financial system by easing the liquidity constraints in an economy. Entrepreneurs and consumers in developing countries operate within the constraints of little developed financial and credit systems. They confront inefficient credit markets, and available evidence indicates that access to credit is among

the biggest concerns of development (Paulson & Towsend, 2000). Several recent papers also suggest that credit constraints play a critical role in determining the growth prospects of economies (Banerjee & Newman, 1993; Aghion & Bolton, 1997; Aghion, Caroli & Garcia-Penalosa, 1999). Where credit markets are imperfect, individuals possessing a little wealth might forgo potentially profitable investment opportunities and consumers also might not consume to their desired levels. Therefore, in economics where access to credit is limited, individuals might use remittances to relax such constraints. This relaxation would in turn; get reflected in higher growth. Although this mechanism has not been studied in macro context, evidence is available at the micro level (Dustmann and Kirchamp, 2001). Once credit constraint is relaxed, private investment and consumption increase. The core of the argument is that there exists a level of income below which remittances are significantly used for private consumption, and that only thereafter, consumption begins to increase at a decelerating rate. Thus, the effect of remittances on private consumption and investment depends on the levels of income of the households concerned.

Microeconomic theory treats the utilisation of remittances mainly as a household issue. Most of the literature on the microeconomics of remittances aims at explaining their patterns, motivations, and the impacts on family consumption, by using population censuses and other household-level data. Such studies have found, in general, that remittances help families survive difficult times, undertake investment in landed property, access better education and healthcare and finance small business activities. As the sum total of household consumptions and investments at the national level constitutes a component of aggregate income, remittances should, from a micro perspective, have a positive impact on growth (Kireyev, 2006). The literature on the macro impact of remittances remains largely in discovery. It is generally recognised that the long-run impact of remittances on receiving economies depends on whether they are spent on consumption or investment (Kireyev, 2006).

Since remittances have a substantial impact on income distribution in the receiving countries, the endogenous growth literature associates the macro impact of remittances with their distributive effects. Such studies focus on human capital formation and inequality as the key determinants of productivity impact on growth (Chaimi et al., 2003; Rapoport & Docquier, 2005). However, there exists no identifiable theoretical or empirical study that looks at the impact of remittances on key macroeconomic sectors. Part of the problem lies in the fact that very few of the existing macro models seem suitable for treatment of the impact of labour migration and remittances on growth, fiscal and monetary policy, balance of payments, and the exchange rate (Kireyev, 2006).

A Keynesian model approach might enable an assessment of the marginal propensity to save, by using expenditure data of GDP. Low consumer deposits in, and quick withdrawals of remittances from banks would suggest that at the given level of income, consumption is relatively high and saving is lower. At the same time, booming imports in a large number of developing economies, in recent years, in parallel with growing inflows of remittances, suggest that a substantial part of remittances is spent on consumption of imported goods. The impact on growth depends on the interaction between the magnitude of net remittances and the marginal propensity to save. This approach is likely to suggest a smaller impact of remittances on growth.

There are also other key important effects of remittances to be reckoned in an open economy context. Under a national accounts approach, the macroeconomic impact of remittances would depend mainly on the behaviour of the current account. There are at least three possible channels of impact: a direct channel as remittances are an integral part of the current account, and two indirect channels, through the exchange rate and the relative prices respectively. The direct impact of remittances on the current account is unclear. On the one hand, the net inflows improve the current account and on the other hand, as a substantial

proportion of remittances are spent on imports, it works in the opposite direction, by widening the trade deficit. While the actual effect would be determined by the marginal propensity to import out of remittances, under this approach the current account can never become worse with increases in remittances. In the extreme case, where the marginal propensity to import out of remittances is one, the current account balance would remain unchanged. Otherwise, it may improve. The indirect impact on the current account through the exchange rate is likely to be negative.[12] An inflow of foreign exchange normally leads to real appreciation of the home currency, either through a nominal appreciation or through inflation as additional demand pushes consumer prices up. Real appreciation should, other things remaining equal, worsen the current account, as domestic exports become less competitive internationally. Thus, there is a possibility that countries would face a situation similar to the Dutch Disease problem in which remittance inflows cause a real appreciation or postpones depreciation, restricting export performance and hence possibly limiting the output growth and employment. Consumption and trade deficits go up as imports become cheaper with exchange rate appreciation. However, for considering the impact of remittances on exchange rate and their impact on macro economic activities a full model is required which is a complex task to undertake in the present paper. Instead the study tries to examine the impact of remittances in a simple model based on earlier exercises made in other country contexts.

There exists very little evidence of remittances directly contributing to savings or other financial investments (Ahlburg 1991; Brown & Connell 1993). The inclination to save out of remittances has been no different from the inclination to save out of total income, since remittances are one of the several sources of income (Walker & Brown 1995). However, where there exist opportunities and where consumption goals have been satisfied, remittances are used for investment. Remittances from migrants to their households raise incomes of the unemployed back

home which, in turn, influence their incomes, consumption as well as their saving and investment decisions. Receipts of outside funds by the unemployed would cause their unemployment incomes to rise. But if some remittances are invested, the net effect of remittances in the labour market of the home country would be to increase employment. In particular, during periods when firms are financially constrained, remittances tend to reduce the unemployment rate in the home labour market. Clearly, lack of funds for investment adversely affects the pace of economic development.

However, the inflow of remittances may reduce participation rates in productive works because of its income effect. Although opinions differ as to whether migration and remittances have negative or positive impacts for both the sending and receiving countries, the literature on the question argues in favour of the position that remittances feed economic growth and reduce poverty if they are properly harnessed. Remittances would have a direct distributive impact on the receiving households, as they improve the economic status of their members. It is a part of a process of integration of their countries into the global economy, through labour migration.

Remittances are likely to rise when the recipient economy suffers from downturns in its activity or macroeconomic shocks caused by financial crisis, natural disaster, or political conflict, because migrants tend to send more funds during hard times at home to help their families and friends. Remittances may thus even out consumption expenditure and contribute to the stability of the recipient economies by compensating for the foreign exchange losses caused due to macroeconomic shocks. To the extent they increase consumption; remittances increase per capita income levels and reduce poverty and income inequality, even if they do not directly impact on growth. Along with positive effects, remittances could have adverse impacts as well. Large inflows have some undesirable

side effects. Higher remittances may be expected to have direct repercussions on foreign exchange rates, domestic interest rates, and balance of payments, and also indirect repercussions on macro variables. Large and sustained remittance inflows causing appreciation in the real exchange rate can reduce export competitiveness. As the main objective of the present study is to examine the macro economic impact of remittances, the study develops in the following, general models for examining the impact of remittance on private consumption, investment and output growth for a recipient economy like India. The novelty of the present study is that on the basis of general macro models, it tries to understand the impact of remittances using advanced time series models, as such work hardly exists at the macro level for India.

A Framework for Treatment of Macro Economic Impact of Remittances

This section develops a framework for examining the impact of remittances on private consumption, investment and output growth in a nested approach (combination of standard Keynesian and Neo Classical framework) in which remittances are considered to be an addition to the total domestic income which give rise to increased consumption and, once consumption needs are satisfied, then it is utilized for investment. If remittances could directly be utilized for real investment, it would translate into higher output growth. Private consumption is assumed to depend on income, wealth, private transfers, rate of interest, and openness of the economy[13]. Private investment mainly depends on rental cost of capital, availability of bank credit and funds available from other sources, as well as openness of the economy and other complementary and supplementary factors[14]. Economic growth rate mainly depends on gross private sector investment, openness of the economy, fiscal policy and rates of interest. These functional specifications are based on general type of models grounded on sound economic reasoning.

(a) Private Consumption Model

$$C = \alpha_1 Y + \alpha_2 W + \alpha_3 R + \alpha_4 REM + \alpha_5 EXMPCA/GDP + \alpha_6 Z + U$$

C= Private Consumption in the domestic market

Y = Income/Output

W = Wealth (land & buildings, stocks/shares and bonds, currency in hand and other assets)

R = Rate of Interest

REM = Remittances

EXMPCA/GDP = Openness Measure (Export plus Import and Capital Account Balance/GDP)

Z= Other variables (Public Expenditure)

(b) Private Investment Model

I = Private Investment (Gross Private Capital Formation in the Domestic Market)

Y = Output

UCC = User Cost of Capital (rental cost of capital) [15]

REM = Remittances

EXMPCA/GDP = Openness Measure (Export plus Import and Capital Account Balance/GDP)

GDB=Government Domestic Borrowings

Z= All other relevant variables (Bank Credit, Government Expenditure and Government Domestic Borrowings, Public Sector Investment)

(c) Economic Growth Model

Y = Growth Rate of Output

I = Growth Rate of Private Sector Investment

EXMPCA/GDP = Openness Measure (Export plus Import and Capital Account Balance/GDP)

REM = Growth Rate of Remittance Inflows

GBORR = Growth Rate of Fiscal Deficits of Borrowings

R = Rate of Interest

Z = Alternatively stands for Government Total Expenditure/Growth of Bank Credit/Inflation Rate.

Data Sources

Migrants usually send money to their country of origin in a variety of channels. Wherever available, they use formal channels such as banks and money transfer services. In other instances, they also use informal channels. For many reasons, it is a daunting task to measure total remittances since a large proportion comes through informal channels.[16] Official figures underestimate the size of remittance flows because they fail to capture informal transfers, in rare instances over-accounting also occurs. Other types of monetary transfers including illicit transfers cannot always be distinguished from migrants' remittances. Furthermore, remittances could be transferred via third countries, complicating the estimation of remittances data by source and destination countries. Remittance figures, thus, are only general estimates at best; but new estimates have appeared which demonstrate the enormous impact that remittances from the US and elsewhere have on developing countries. It should also be emphasised that remittance data are generally under-reported and that IMF estimates are reported late or are not reported, and regional remittances are higher than estimates reported for individual countries. For example, workers' remittance credits for Asia in the 1995

Yearbook are reported to be $ 11 billion, even though the sum of the estimates for the listed countries comes to be only to $ 3.3 billion, with no remittances listed for India and Pakistan. On the other hand, the surge in officially recorded estimates of remittances to developing countries in recent years reflects better data collection owing to greater awareness of the development potential of remittances (improvement in infrastructures for transferring the funds) as well as concerns about money-laundering (RBI Annual Report, 2005).[17] The RBI has started reporting the amount of total private transfers since the 1990s. Even though there is a discrepancy in the statistics between those reported by IMF and the RBI, in order to have a longer time series analysis, the study considers the data from various issues of IMF Balance of Payment Year Book Statistics.

The combined government debt refers to the aggregate government debt of the Centre and the States. Government debt is considered as a part of liquid wealth of the private sector. The volume of other liquid assets is captured as narrow money (M1) minus demand deposits. Demand deposits are subtracted from narrow money as a portion of total deposits goes for financing the fiscal deficits of the governments.[18] The openness measure is defined as the sum of current account items net of remittances plus capital account balances as a ratio of GDP (EXMPCR). Remittances are considered separately in order to examine their differential impact. Real rate of interest is defined as State Bank of India (SBI) deposit rate net of inflation rate, derived from the GDP deflator. Private consumption refers to the final consumption by households in the domestic market. Private investment is measured from gross domestic private capital formation in each year. The study covers the period from 1966-67 to 2003-04. Thus, the study relied on IMF source for obtaining the remittances data, all other variables are collected from reports of Reserve Bank of India, Ministry of Finance and Central Statistical Organisation (CSO).

Econometric Methodology

Our primary interest is the analysis and estimation of the long run impact of remittances on private consumption, investment and economic growth in India. In order to understand the long-term impact of remittances on major macro variables, the present study employs time series models. The important reason of applying time series models is that the dynamics inherent in time series models takes care of the expectational factors into the modeling exercise. This consideration suggests us the application of a cointegration procedure. As the variables in the model are expected to be integrated at different orders, it requires a cointegration procedure which would be suitable in the presence of a mixed set of different order of integrated variables in the model. The other relevant method may also be utilized for confirming the robustness of the estimates obtained from cointegration. Thus, in this context, the present study employs an error correction model devised by Banerjee (1998, 2000) and the Dynamic Ordinary Least Square (Stock and Watson (1998)), which take care of the time series problems and expectations of macroeconomic agents such as consumers and investors (producers) in an economy.

Therefore, in order to obtain reliable estimates the study uses two different estimational tools i.e. the ECM co-integration procedure proposed by Banerjee, Dolado and Mestre (1998) and the Dynamic OLS (DOLS) procedure of Stock and Watson (1993). Banerjee et al. show that the ECM procedure provides a reliable test of co-integration as well as an unbiased estimate of the long run relation when the explanatory variables are weakly exogenous for the parameters of interest[19]. Secondly, the Dynamic OLS estimates have also been shown to provide unbiased and asymptotically efficient estimates of the long run relation, even in the presence of endogenous regressors. Further, a comparison of the estimates obtained by the above two procedures provides some information about whether explanatory variables are actually endogenous

or not. A brief description of the ECM-cointegration and DOLS procedures is also provided in Appendix I. The following section provides estimates for three macro models, using both the time series models. For lucidity of understanding, the results are presented in three sections.

Empirical Results for the Private Consumption Model

This section presents results for the private consumption model. In accordance with the usual time series modelling practice, prior to estimating the cointegration relationship, the study begins by investigating the time series properties of all relevant variables considered in the consumption model by carrying out the unit root tests. Using the Augmented Dickey Fuller (ADF) unit root test, most of the variables except RDRGDP (real interest derived from GDP deflator) and EXMPCR (openness measure) used in the consumption model are found to be integrated of order one as shown in Table 2. The variables such as private

Table 2: Unit Root Test Results for Variables Used in Private Consumption Model

	ADF	PP	ADF	PP
	Levels		Differences	
PFCE	$-1.50(1)^T$	$-1.24(1)^T$	$-4.00(3)^T$	$-8.64(3)^T$
AGDD	$-2.22(1)^T$	$-2.39(3)^T$	$-3.41(1)^C$	$-4.85(3)^C$
REM	$-2.0(1)^T$	$-2.39(1)^T$	$-2.58(1)^N$	$-5.14(1)^C$
MSDD	$-2.37(1)^T$	$-2.45(1)^T$	$-2.94(1)^C$	$-2.68(1)^C$
AGDDEXRBI	$-2.19(1)^T$	$-2.10(1)^T$	$-3.59(1)^C$	$-4.32(1)^C$
RGDP	$6.08(1)^C$	$11.81(1)^N$	$-5.47(3)^T$	$-8.05(3)^T$
RDRGDP	$-5.98(3)^T$	$-4.59(3)^T$		
EXMPCR	$-4.04(1)^T$	$-3.71(3)^T$		

Note: The critical values at 1%, 5% and 10% are -2.62, -1.95, -1.62 respectively for (without trend and intercept denoted by N) and -3.64, -2.95 and -2.61 respectively (without trend but intercept, denoted by superscript C) and -4.26, -3.55 and -3.20 respectively (with trend and intercept, denoted by superscript T). All variables are in natural log terms.

final consumption expenditure (PFCE), aggregate governments' domestic debt (AGDD), aggregate governments' domestic debt exclusive of the debt from RBI (AGDDEXRBI), real gross domestic product at factor cost (RGDP), and narrow money stock net of demand deposits (MSDD) are found to be stationary at first differences. The same result has also been confirmed from the Phillips Perron test.

The ECM procedure involves testing for stability of the parameters. Our result shows that there is a clear-cut evidence of co-integration in all the models produced here corroborating to the evidence in favour of a stable long-run relationship among the variables. This points out the fact that while the policies of financial liberalisation may have affected the level of private consumption and investment, they do not seem to have changed the long run private consumption and investment functions. It is to be noted that almost all the estimations were carried out using the ECM and DOLS procedures except in rare instances in which they do not satisfy the statistical criterion.[20] The ECM procedure here involves up-to-first-order-lags of the dynamic terms and the same order leads of the dynamic terms; a higher order was usually not feasible given that we usually had 32 to 34 annual observations available for our study. Similarly, the dynamic OLS was also carried out with up-to-first-order-of- lags and leads, in dynamic terms. The insignificant terms were dropped in both the procedures.

Empirical Analysis for Private Consumption Model

The ECM results in Table 3 shows that there exists cointegration among the variables in both the models as the statistic corresponding to the lagged dependent variable of the ECM equation is found to be significant at the reasonable level of significance. This confirmation of cointegration is based on the critical values provided by Ericsson and Mackinnon (2002). Since economic policies are more concerned with the long run effects, examining the long run coefficients[21] in the first column of Table 3 (with the first definition of government debt), one can

see that income and remittances, both positively influence private consumption along with government debt and money supply net of demand deposits. The latter two components are supposed to represent a part of the total private sector wealth; therefore, as expected, they exert positive influence on private consumption over the long run.

When the same equation is estimated with an alternative definition of government debt which excludes part of the government borrowing from the Reserve Bank of India (AGDDEXRB)[22], one finds that the long run coefficients produced in second column of Table 3 show the

Table 3: Long Run Estimates from ECM to Cointegration Approach

	PFCE	PFCE
	1	2
INPT	4.26 (14.11)*	4.53 (16.42)*
RGDP	.38 (6.61)*	.36 (6.68)*
AGDD	.11 (5.55)*	
AGDDEXRBI		.096 (6.25)*
RDRGDP	.0006 (.92)	-.0006 (-1.05)
EXMPCR	-.010 (-.49)	-.02 (-1.05)
MSDD	.18 (3.75)*	.20 (4.25)*
REM	.05 (6.27)*	.058 (9.02)*
PFCE(-1)	-.62(-4.81)**	-.62 (-5.85)*
R-Bar Square	.95	.96
Serial Correlation	.18	.15
Functional Form	2.51	3.88**
Normality	1.89	.18

Note: **- significance at 5% and *- significance at 1%. When K=7, the Ericsson and Mackinnon's critical values for testing cointegration on ECM coefficients are -5.39, -4.42 and -3.98 at 1 %, 5% and 10% respectively.

same/consistent sign as in the previous estimates with government debt inclusive of borrowings from the RBI. Incomes, government debt, narrow money supply net of demand deposits and remittances positively influence private consumption, while openness measure adversely affects private consumption. This result may be due to the fact that the effect of remittances is similar to the effect of additional or increased income, in a developing economy. The openness measure having an adverse impact could be attributed to the fact that import may be highly in favour of raw materials for enhancing productivity of industries in India. That means less is being imported for consumption purposes.

The dynamic ordinary least square estimates show that income, remittances, government debt, and money supply net of demand deposits positively influence private consumption while openness measure has an adverse effect on private consumption. This implies that the signs of the estimates are consistent with the estimates obtained from previous ECM-cointegration results, thus proving the robustness of the results.

$$
\begin{aligned}
PFCE = \quad & 3.22 \quad + .50 \, RGDP + .13 \, AGDD - .0001 \, RDRGDP - .08 \, EXMPCR + .10 \; MSDD \\
& (17.04)^* \quad (12.95)^* \quad (8.31)^* \quad (-3.22)^* \quad (-4.60)^* \quad (2.73)^* \\
& + .043 \, REM - .034 \, DEXMPCR\{0\} + .015 \, DREM\{0\} - .087 \, DRGDP(+1) + .094 \, DAGDD(+1) \\
& (7.67)^* \quad (-2.17)^{**} \quad (2.47)^{**} \quad (-1.66)^{***} \quad (2.76)^*
\end{aligned}
$$

R - Squared   = .99   R - Bar - Squared   = .99
DW - statistic   =   2.13
Serial Correlation = CHSQ(1) =   2.78[.59]
Functional Form   = CHSQ(1) =   .78[.97]
Normality   = CHSQ(2) =   1.39[.56]

When the alternative form of government debt exclusive of the borrowing from the RBI is considered in the DOLS model, it is seen that income, government debt, money supply exclusive of demand deposits and remittance positively influence private consumption and that real deposits rate and the openness measure adversely affect private consumption. Although the signs of parameters are consistent, it is surprising to note that interest rate has turned out to be significant. It adversely affects private consumption along with the openness measure.

$PFCE = 3.24 + .51\,RGDP + .085\,AGDDEXRB - .001\,RDRGDP - .11\,EXMPCR$

$(11.11)* \quad (11.04)* \qquad (5.36)* \qquad\qquad (-2.68)* \qquad\qquad (-3.49)*$

$+.12\,MSDD + .060\,REM + .067\,DEXMPCR\{0\} + .032\,DEXMPCR\{-1\} - .031\,DREM\{0\}$

$(2.92)* \qquad (7.50)* \qquad (2.65)* \qquad\qquad (1.68)** \qquad\qquad (-3.21)*$

R - Squared = .99 R - Bar - Squared = .99

DW - statistic = 1.98

Serial Correlation = CHSQ(1) = .064[.80]

Functional Form = CHSQ(1) = .012[.91]

Normality = CHSQ(2) = 1.11[.30]

On examining the impact of remittances on private consumption in a general type of consumption model, the study, through the application of time series models, finds that remittances along with government debt, money supply (net of bank demand deposits) and income consistently have a positive influence on private consumption in both the time series applications considered here. (the alternative definitions of government debt followed in the study without making any difference). This suggests that government debt is perceived as a wealth component of the private sector. When public debt increases, people think that their wealth is getting increased; as a result they spend more on consumption disregarding its future implications in terms of tax burden that they have to bear. The money in circulation with public shows, that it has wealth effects as it has a positive impact on private consumption. Income along with remittances, as expected, in a developing economy like India, has positive and significant influence on private consumption, implying that the effect of remittances on private consumption seems to be not different from the effect of income. The real deposit rate does not have influence on private consumption (except in the DOLS model where government debt is defined to be exclusive of borrowing from RBI). In the ECM model, the openness measure although with first definition of combined government debt, where the government debt includes borrowing from RBI, does not show any significant influence on private consumption; but it does show a significant influence in all other time series models.

The openness measure having an adverse impact on private consumption may suggest that India is accumulating international reserves, but spending relatively less on imports for consumption purposes irrespective of whatever is being earned abroad.

Empirical Analysis for Private Investment Model

The primary interest here is to examine the long-run impact of remittances on private investment taking into account all other relevant factors affecting/determining private investment. When the variables in the private investment model are tested for unit roots, it is found (see Table 4) that government borrowing (Aborr), government borrowing exclusive of borrowings from the RBI (Aborrex) and user cost of capital (Ucrgpf)[23] are integrated of zero order, while rest of the variables such as gross private fixed capital formation (RGPFCF), public sector investment (RPSCF) and gross bank credit to the private sector (GBC) used in the estimation are integrated of order one. Therefore, testing of unit roots ensures us that there exists a mixture of both I(1) and I(0) variables, in the private investment model.

Table 4: Unit Root Test Results for Variables Used in the Private Investment Model

	ADF	PP	ADF	PP
Aborr	-3.98(1)T	4.76(1)T		
Aborrex	-3.77(1)T	-5.52(1)T		
RGPFCF	-1.52(1)T	-1.23(1)T	-5.62(1)T	-7.16(1)T
RPSCF	-2.52(1)T	-2.74(1)T	-6.74(1)C	-6.63(1)C
UCRGPF	-4.67(1)T	-4.99(1)T		
GBC	-2.90(1)T	-2.15(1)T	-3.93(1)C	-5.04(1)C

Note: The critical values at 1%, 5% and 10% are -2.62, -1.95, -1.62 respectively for (without trend and intercept denoted by N) and -3.64, -2.95 and -2.61 respectively (without trend but intercept, denoted by superscript C) and -4.26, -3.55 and -3.20 respectively (with trend and intercept, denoted by superscript T). All the variables are in natural log terms.

Similar to the private consumption model, here we also present estimates for the private investment models which show a clear-cut evidence co-integration. Estimations are carried out using the ECM to cointegration and DOLS procedures.

The ECM result for private investment equation shows that the lagged dependent variable is significant in all the equations presented in Table 5 indicating the presence of cointegration among the variables in all the models. The estimates of the private investment equation presented in column 1 of Table 5 show that in the long-run, output positively influences private investment along with openness measure. Although the user cost of capital and government borrowings bears negative signs as expected, they are not significant in their impacts. Remittances have a significant adverse impact on private investment. This adverse impact of remittances may be due to withdrawal of resources from investment, increasingly towards private consumption.

The estimates, with the alternative borrowing definition, which is the aggregate of combined government borrowing net of borrowings from the RBI, shown in column 2 indicates that in the long-run, output and openness measure have positive and significant impacts on private investment while remittances exert negative impact. Although Government borrowing and user cost of capital have expected signs, they are insignificant in exerting influence on private investment in the country.

When bank credit is included as an explanatory variable in the ECM model[24], it is found that the major key variables have significant impacts on private investment in the long-run as shown in column 3 of Table 5. In line with the acceleration principle, an increase in output/income has a positive impact on private investment. This may be acting through its effect on aggregate demand. The openness measure positively influences private investment due to the fact that openness of the economy gives rise to technological diffusion in the economy through technology

Table 5: Long-Run Estimates For Private Investment Model

	RGPFCF	RGPFCF	RGPFCF	RGPFCF	RGPFCF
	1	2	3	4	5
INPT	-3.29 (-1.68)***	-1.83 (-.81)	-8.85 (-12.94)*	-9.00 (-13.74)*	-3.47 (-5.92)*
RGDP	1.46 (13.90)*	1.38 (11.31)*	1.89 (30.01)*	1.88 (30.52)*	1.80 (41.72)*
ABORR	-.051 (-1.56)		-.002 (-.08)		
ABOREX		-.012 (-.29)			
RPSCF					-.78 (-11.45)*
UCRGPF	-0.30 (-.76)	-.031 (-.69)	.02 (1.27)	.022 (1.43)	.02 (1.43)
EXMPCR	.99 (3.60)*	1.19 (3.74)*	.21 (2.54)*	.19 (2.48)*	.25 (3.7)*
REM	-.27 (-4.10)*	-.33 (-4.19)*	-.078 (-2.70)*	-.08 (-3.00)*	-.102 (-.52)
GBC			-.33 (-7.82)*	-.31 (-7.38)*	
RGPFCF(-1)	-.67 (-4.36)**	-.62 (-3.87)**	-.95 (-6.07)*	-.93 (-6.14)*	(-1.27) (-6.54)*
R-Bar Square	.74	.71	.80	.81	.83
Serial Correlation	2.54	3.43**	7.88*	12.61*	8.07*
Functional Form	3.86**	1.62	6.35*	6.87*	.70
Normality	.41	.22	.97	.34	.67

Note: *** denotes significance at 10% level, - significance at 5% and *-
significance at 1%. When K=7, the Ericsson and Mackinnon's
critical values for testing cointegration on ECM coefficients are -
5.39, -4.42 and -3.98 at 1 %, 5% and 10% respectively. When
K=6, the critical values for cointegration are -5.17, -4.27 and -
3.83 at 1 %, 5% and 10% respectively. When K=5, the critical
values for cointegration are -4.92, -4.07 and -3.66 at 1 %, 5%
and 10% respectively.

and capital transfers in consequence enhancing the rate of investment and productivity. The negative impact of remittances could be due to the fact that they directly get absorbed in consumption spending and do not result in increased private investment. Bank credit to the private sector, contrary to expectation of a positive impact, is seen to have an adverse impact on private investment, may be due to the fact that bank credit is deployed in unproductive sectors resulting in low productivity and hence in a lowering of private fixed investment in the economy. This is also the reason why at some point in time, there existed a huge amount of non-performing assets with the commercial banks in India.

When public debt is dropped from the model (equation without debt but with bank credit), it could be noticed in column 4 that the variables are consistent in their impact on private fixed investment. The output and openness measures positively influence private fixed investment while bank credit and remittances negatively influence it.

When government debt is replaced with public sector investment, the long-run estimates produced in column 5 of Table 5 show that the inclusion of public sector investment has made remittances to become insignificant and user cost of capital positive, although insignificant. Remittances becoming insignificant may be the reason why public sector investment plays a more significant and dominant role in crowding out private fixed investment than the impact of remittances. The output and the openness measure continue to have favourable impact on private fixed investment.

However, it is to be noted that when inflation rate is included as a measure of uncertainty for business or investment climate, inflation rate is found to have only insignificant impact on private fixed investment. This result may be due to the fact that inflation rate has been maintained relatively at a modest level in the country for several decades. It is not as high as in many developed and developing countries.

Results with DOLS

In order to check the robustness of the above results, private investment model corresponding to column 1 of Table 5 is estimated with DOLS; is then seen that while output and openness measure continue to have positive influence, remittances exert a negative impact on private investment along with government borrowing and user cost of capital, as one would have theoretically expected.

$RGPFCF = -5.45 + 1.58\ RGDP - .13\ Aborr - 0.07\ Ucrgpf + .66\ EXMPCR - .19\ REM +$
        $(-3.73)*(18.37)*$ $(-3.80)*$ $(-3.04)*$ $(3.52)*$ $(-4.06)*$
$.10\ DAborr(0) + .56\ DAborr(-1) - .46\ DEXMPCR(0) - .18\ DEXMPCR(-1) - .104\ DREM\{0\}$
$(3.60)*$ $(2.56)*$ $(-3.28)*$ $(-1.76)***$ $(-2.06)*$

R - Squared =   .99   R - Bar - Squared = .99
DW - statistic =   1.90
Serial Correlation [CHSQ(1)] = .07[.79]
Functional Form [CHSQ(1)] = 3.74[.06]
Normality   [CHSQ(2)] = .37[.83]

DOLS Estimates (with alternative definition of government borrowing)

On considering the combined government borrowing net of borrowings from RBI instead of total borrowing in the estimable equation (as in column 2 of Table 5), it is found that government debt has a significant adverse impact on private fixed investment along with remittances. The user cost of capital is insignificant and the output and openness measure of the economy are consistently found to have positive impact on private fixed investment.

$RGPFCF = -4.60 + 1.52\ RGDP - .087\ Aborex - .044 UCRGPF + .75\ EXMPCR - .22\ REM$
        $(-2.68)*\ (14.92)*$ $(-2.27)**\ (-1.22)$ $(3.52)*$ $(-4.18)*$
$+ .056\ DAborex\{0\} - .47\ DEXMPCR(-1) - .25\ DEXMPCR(-1) + .11\ DREM\{-1\}$
$(2.11)**$ $(-2.87)*$ $(-2.15)**$ $(1.92)***$

DOLS Estimates with Public Sector Investment

In the DOLS, when public sector investment is introduced along with retaining other previous variables in the model, one finds that government borrowing and remittances lose their significance in exerting their adverse impact on private sector fixed investment. Although user cost of capital has become insignificant, surprisingly it is contrary to the general expectation, found to alter its sign. Output and openness measures are found to retain their consistent signs. They continue to exert positive impacts on private sector fixed investment. With alternative definitions of government borrowing, it is also seen that the signs for the major variables remain consistent, as was observed in the previous estimates. But the corresponding estimates of ECM to cointegration are not produced as they do not reject the null hypothesis of cointegration and do not pass the diagnostic tests.

$$RGPFCF = -4.21 + 1.76\,RGDP - .006\,Aborr + .035\,UCRGPF + .24\,EXMPCR - .048\,REM$$
$$(-4.00)*(28.77)* \quad (-.30) \quad\quad (1.98) \quad\quad\quad (2.46)** \quad\quad (-1.62)***$$
$$-.66\,RPSCF + 0.72\,DREM\{-1\}$$
$$(-7.92)* \quad\quad (1.98)**$$

R - Squared   = .99   R - Bar - Squared = .99
DW - statistic   = 1.73
Serial Correlation[CHSQ(1)] = .32[.57]
Functional Form [CHSQ(1)] = .07[.78]
Normality   [CHSQ(2)] = .46[.79]

DOLS Estimates without Debt but With Bank Credit

When public debt is dropped from the model (model corresponding to column 4 of Table 5), it shows that the variables are consistent in exerting their impacts on private fixed investment. It could also be

observed that similar results hold good as with the long-term parameter estimates using the ECM to cointegration technique. The output and openness measures have positive influence while remittances and credit have adverse impact.

$$RGPFCF = -6.03 + 1.72\,RGDP - .02\,ucrgpf + .64\,EXMPCR - .20\,REM - .22\,GBC$$
$$(-4.65)^* \quad (17.50)^* \quad (-.93) \quad (3.68)^* \quad (-3.95)^* \quad (-3.12)^*$$
$$-.49\,DRGDP\{-1\} \quad .04\,Ducrgpf\{-1\} \quad -.40\,DEXMPCR\{0\} \quad -.30\,DEXMPCR\{-1\}$$
$$(-1.70)^{***} \quad (2.13) \quad (-2.82)^* \quad (-2.03)^*$$
$$-.10\,DREM\{0\} \quad -.17\,DREM\{-1\} \quad .70\,DGBC\{-1\} \quad -.15\,DREM\{-1\}$$
$$(-2.11)^{**} \quad (4.09)^* \quad (-4.11)^{**} \quad (-3.05)^*$$

R - Squared = .99   R - Bar Squared = .99
DW - statistic = 2.08
Serial Correlation CHSQ(1) = .088[.77]
Functional Form CHSQ(1) = .03[.91]
Normality CHSQ(2) = 1.31[.72]

From the analysis of private investment modeling, it is found that output and openness measures positively influence private investment while remittances has adverse impact along with bank credit. This suggests that remittances do not result in productive investments and are highly consumption-oriented in nature. The reason of the adverse impact of bank credit could be the utilization of credit in unproductive investments. When government borrowing is replaced with public sector investment, it is found that public sector investment adversely affects private sector investment, even neutralizing the impact of remittances. The adverse impact of public sector investment could be due to two factors: resource absorption (financial and physical resources) by the public sector and public sector investment in the competing sectors in which private investment is operating.

Empirical Analysis for Growth Model

Table 6 presents the unit root test results for the variables used in the growth model estimation. It may be noticed that the real growth rate

of GDP (rgdpgr), the real growth rate of gross private fixed capital formation (rgpfcgr), and the growth of government borrowings or growth rate of gross fiscal deficits (aborrgr) are all integrated at zero order except the openness measure which happens to be first difference stationary. Thus, there is a mixture of I(0) and I(1) variables in the model, necessitating the use of appropriate cointegration techniques in order to understand the long-run relationship among the variables. The study uses the same ECM to cointegration technique, as was used in the preceding estimation.

Table 6: Unit Root Test Results for Variables Used in Growth Model

	ADF	PP	ADF	PP
rgdpgr	-5.01(-1)T	-7.62(-1)T		
rgpfcgr	-5.58(1)T	-7.13(-1)T		
remgr	-2.45(-1)N	-4.31(-1)N		
exmpcr	-2.86(-1)T	-2.91(-1)T	-5.30(-1)C	-5.14(-1)C
aborrgr	-5.39(-1)T	-6.58(-1)T		

Note: The critical values at 1%, 5% and 10% are -2.62, -1.95, -1.62 respectively for (without trend and intercept denoted by N) and -3.64, -2.95 and -2.61 respectively (without trend but intercept, denoted by superscript C) and -4.26, -3.55 and -3.20 respectively (with trend and intercept, denoted by superscript T). All of the above variables are in growth rates except the openness measure which is in the form of a simple ratio to GDP.

The ECM models shown in Table 7 shows that the t-statistics corresponding to the coefficient of lagged dependent variable in both the models exceeds the critical value of cointegration test, thus confirming the presence of a long run relationship among the variables in the model. By taking a look at the long-run estimates in column 1 of Table 7, one can see that gross private investment positively and significantly

influences economic growth while the growth rate of fiscal deficit significantly and adversely influences the economic growth rate.

Table 7: Long Run Estimates of Growth Model

	RGDPGR	RGDPGR
	1	2
INPT	3.74 (14.47)*	-3.32 (-8.44)*
RGPFCGR	.224 (7.39)*	.21 (5.70)*
REMGR	.008 (1.39)	.002 (.47)
EXMPCR		2.49 (0.87)
AborrGR	-0.14 (-4.31)*	-.01 (-4.19)*
RGDPGR(-1)	-1.44 (-11.04)*	-1.52 (-11.22)*
R-Bar Square	.97	.97
Serial Correlation	1.14	2.31
Functional Form	1.51	2.19
Normality	.31	.69

Note: ** - significance at 5% and *- significance at 1%. When K=5, the critical values for cointegration are -4.92, -4.07 and -3.66 at 1 %, 5% and 10% respectively.

When the openness measure is included in the ECM equation, the corresponding long-run estimates produced in column 2 show that in conformity with the previous results, the growth rate of private sector investment has significant and positive influence on the growth rate of output, while the growth rate of fiscal deficits or government borrowing has an adverse impact. However, it is surprising to note that the openness measure has no significant influence on economic growth rate, may be due to the dominant impact of the growth of government deficit or borrowing which neutralizes the influence of the external sector on economic growth.

In contrast, when the results were verified with DOLS, it was found that growth of remittances along with fiscal deficits does not have significant influence on the growth rate of the Indian economy while the growth of private investment is the only significant factor positively influencing the real economic growth. This finding also questions on the rationale of large amounts of government deficits and therefore resource absorption by the government even in productive sectors. It was also seen that neither inflation rate nor real bank lending rates influence the growth rate in any of the specifications, irrespective of whether the ECM or DOLS procedure is used. This suggests that policies are required for allocating bank credit among productive sectors of the economy. It is to be emphasized that when the dummy variable was introduced for the year 1991 for all of the above models representing significant policy options, it is surprisingly found to be insignificant without making any difference in the result estimates.

Conclusion and Policy Suggestions

The study made an attempt to examine the impact of remittances on macroeconomic activities (viz private consumption and investment) and its implications on economic growth in India during the period from 1966-67 to 2003-04. Based on macro economic theories and rationality, estimations were carried out of the basic macro models. On examining the impact of remittances on private consumption in a general type of consumption model, the study, through the application of time series models, finds that remittances along with debt, money supply (net of bank demand deposits) and income consistently have positive influences on private consumption. This suggests that the effect of remittance is not different from that of income and this is on an expected line for a developing economy as it has income effect. The result also implies that government debt is perceived as net wealth by the private sector. With the increase in public debt, private sector perceives that their wealth is also getting increased and as a result, they tend to spend more on

consumption ignoring its implications in terms of future tax burden that they have to incur. Currency in circulation with the public has positive impact on consumption proving its wealth effect.

On examining the impact of remittances on private investment and output growth, the study mostly finds that remittances have an adverse impact on private investment while the effect of growth of remittances have no effect on the growth rate of output. This is something quite puzzling. The neutral impact of growth of remittances on output growth could be one of the important factors contributing to the inflationary upsurge in the country in recent years, despite the economy having maintained a record of moderate inflation rate over the decades. The increase in remittances gives rise to increased consumption demand thus raising the prices. Remittances give rise to net addition to the stock of foreign currency and hence contributing to the rise in domestic money supply and generating demand pressures. If resources could be utilized for productive investments, that would raise the real output. Therefore, the government should take suitable measures for diverting from the unproductive uses of remittances to its productive uses, so that they raise investment, and the real output growth.

Therefore, the study suggests that the government policy should be aimed at inducing the private sector to allocate resources increasingly for investment for leveling up the rate of growth in the economy. Otherwise a significant proportion of remittances would only be devoted to increase private consumption without any contributory impact on the economy. Regarding the influence of other variables, the study finds that while the public sector investment crowds out private sector fixed investment, the openness measure raises the level of private investment but surprisingly without any impact on economic growth; while the growth rate of private sector investment is significant in boosting output growth, the growth rate of fiscal deficit or government borrowing has either adverse or no impact on the output growth rate. This suggests that

the growth rate of fiscal deficit should be kept in check and thereby giving ample scope for private investment to grow in the country which would help the economy to attend a higher growth rate trajectory. In this context, the current fiscal tightening programme in line with the FRBM act (2003) at the Central and the State governments, assumes critical importance. These results have significant bearing upon current macro-economic policy making of the economy.

Hrushikesh Mallick is Lecturer at the Centre for Development Studies, Trivandrum. His research interests include Applied Macro Economics, Monetary Economics and Public Finance.

Email: hrushi@cds.ac.in / hrushi_isec@yahoo.co.in

Notes

1   Migration, whether permanent or temporary is a global phenomenon with individuals from developing countries relocating to higher income regions such as the United States and the European Union in the hope of better job opportunities and higher standards of living. An estimated 175 million persons now live outside their countries of birth, making significant contributions to the social and economic development of their host countries, and to their countries of origin (ADB, 2005). Increasing migration even plays important role in creating higher demand for air travel and tourism and telephone calls between migrants and their families at home, which increase revenues in airline travel and telecommunication. Migrants contribute to development through boosting the levels of demand for local goods and services.

2   The term remittances generally referred to private transfers. These are "unrequited transfers" which, unlike other financial flows such as debt or equity flows, create no counter claims by the senders, such as principal repayments and interest charges as is the case of debt and profit repatriations in the case of equity flows. There are three streams of money transfers, included under remittances as defined in the IMF's Balance of Payments Statistics Yearbook. Worker remittances are the value of monetary transfers' to home from workers abroad residing for more than one year. Compensation of employees (previous labour income) is the gross earnings of foreigners residing for less than 12 months, including the value of in-kind benefits such as housing and payroll taxes. Migrant transfers are the net worth of migrants who move from one country to another. For instance, the value of IBM stock owned by a migrant who moves from US to India gets transferred in international accounting from US to India. Thus, the total remittances are the sum of workers' remittances, compensation of employees and migrant's transfers.

3   The self-interested theories of remittances are, to a certain extent, also based on household behaviour since they view family as a business unit or as a nexus of contracts that enables the members to enter into Pareto-improving arrangements. Different types of businesses or contracts are possible, which has led to various self-interest models of remittances. Lucas and Stark (1985) suggest that migrants may have investment plans which they strive to carry out while they are away for the purpose, they use other family members as agents. The remittances made by the migrants are used to take care of the migrants' interests, but they also contain some compensation packages for the agents.

4   Wahba (1991) divides remittances into "fixed" remittances, which go toward family support, and "discretionary" remittances, which constitute investment flows. Fixed remittances depend on family characteristics like size and income level, and therefore, may be explained by the endogenous migration view. The literature on the causes of remittances has found consistent evidence supporting the notion that family ties based on altruism motivate to remit funds. Altruism in this context is the immigrant's concern over the income or consumption levels of the family members left behind in the source country. Some studies also support the role of remittances as a channel of capital flows.

5   As the volume of remittances increases, an economy is able to spend more than it produces, import more than it exports or invest more than it saves; and this may be more relevant for small economies (Connell and Conway, 2000).

6   India continues to retain her position as the leading recipient of remittances in the world. The World Bank estimates for 2005 put India in the lead at $23.5 billion, with China and Mexico close behind at $22.4 billion and 21.7 billion respectively.

7   A large number of immigrants flow from India to the gulf regions besides to regions of the developed world such as the US, European countries and several emerging Asian economies. With the worldwide revolution in information and technology and the large pool of talents in the area of information and technology in India, especially in the era of globalization, there exists a growing global demand for the skilled manpower of India.. Their emigration brings economic benefits to the economy and has leveraging effect in the creation of demand for telecommunication, transport and overall consumption. As consumption provides critical support to growth of agriculture, manufacturing and the services sector, remittances are likely to provide impetus to overall economic growth. When external currency received in ways of remittances is pumped into the economy and is spent in the areas of education and health, human capital formation receives accelerations, which has significant implication for enhancing the economic growth.

8   The capital flows between countries are defined as changes in the assets and liabilities of residents vis-à-vis non-residents, while the worker remittances are transfers of funds between nationals of a given country. Hence, an inflow of worker remittances does not constitute a capital import from a foreign country, rather a transfer of capital from nationals living abroad towards those living in the home country. The remittances are more stable than private capital flows, and serves as a stabilising instrument during periods of financial instability.

9   In contrast it is also viewed by some that remittances are private flows of foreign exchange, completely distinct in nature from other flows. These receipts are found to be counter-cyclical and as such they provide some elements of stability to the recipient countries.

10   It compensates for the losses that the sending country might incur from brain drain or skimming of its highly skilled workers.

11   Remittances flow because of economies of family. In that the relationship between migrant and family is characterised by altruism, so that the utility of the migrant depends on the utility of his family members at home. This implies that remittances are sent in order to help the family avoid shortfalls created by a poor economy or simple bad luck. This model implies that remittances are compensatory transfers, which should fluctuate counter cyclically. Chami, Fullenkamp & Jahjah (2005) developed a model of remittance based on the economics of the family that implies that remittances are not profit-driven, but are compensatory transfers, and should have a negative correlation with GDP growth in contrast to the positive correlation of profit-driven capital flows. So their model differentiated whether remittances function as capital flows or serve as compensatory transfers. Testing the implication of the model for a number of countries in a panel data regression, they found a robust negative correlation between remittances and GDP growth. Thus, the study indicated that remittances are not intended to serve as source of capital for economic development

confirming that remittances are compensatory transfers, which fluctuate counter-cyclically. In a separate study, Kireyev (2006) assessed the macro economic impact of remittances in Tajikistan, one of highest remittance recipient countries in terms of percentage to its GDP. By including remittances in a number of standard models, the study concluded that overall impact of remittances is ambiguous. The impact depends on the structural characteristics of the receiving country, in particular its consumption and investment patterns, and its capacity to manage large financial inflows.

12   The indirect impact on the current account through relative prices is ambiguous and depends on whether remittances are spent on tradables or non-tradables. Spending primarily on tradables - irrespective of whether consumer or investment goods, can either increase their output or prices, or both. If the spillover from this increase, to non-tradables, is limited, the improvement in the relative prices of tradables should stimulate the production of exportables and contain import growth, thus improving the current account. If remittances are spent primarily on non-tradables, there may be an opposite effect- an increase in their relative price would be akin to nominal appreciation, leading to a growing current account deficit.

13   The general model of private consumption is drawn on from Barro (1974), Hall (1978), Feldstein (1974, 1982), Bernheim (1987), Blinder and Deaton (1985), Modigliani and Jappelli (1987), Modigliani and Sterling (1990), Reid (1985) and Feldstein and Elmendorf (1990), Kochin (1974), Barro (1978), Tanner (1979), Kormendi (1983), Seater (1985), Aschauer (1985), and Seater and Mariano (1985) Kormendi and Meguire (1986) which take into consideration either fiscal deficit and/or stock of public debt in the regression of private consumption along with other relevant variables viz income and wealth.

14   The private investment model is based on the work of Sundararajan and Thakur (1980), Wai and Wong (1982), Blejer and Khan (1984), Cebula 1985), Greene and Villanueva (1991), Faini (1994), Islam and Wetzel (1994) and Haque and Montiel (1994).

15   The user cost of capital is defined as the ratio of price of capital goods to price of all other goods times the real interest rate on capital plus depreciation. Real interest is derived as the rate of interest minus the rate of inflation on capital inputs.

16   The most important factor that determines migrants' choice of remitting funds, through formal or informal channels, is accountability and transparency, transaction costs and volume of remittances. In the case of remittances in-kind, migrants send consumption goods for their family members to their home countries. A large range of informal systems exists which include the migrants carrying money (cash) and goods with themselves or sending them with friends and relatives or returning migrants. There are also a number of informal services, typically engaged in remittances as a side business to their import-export operations, running retail dealing in currency exchange transactions. Most of them operate on the basis of no or little paper transactions or electronic documentation. The most publicised and studied aspects are Hawala and Hundi services.

17   In many countries, Government policies in improving the banking access and the technology of money transfers have led to an increase in the inflow of remittances and promoted money transfers through formal channels.

18   The inclusion of public debt as a wealth variable should ensure that all the components included in the domestic debt are bond-financed government debt. But in developing economies, private individuals directly hold only a small fraction of their wealth on government bonds (in the form of post office certificates and other forms of government bonds). Private individuals indirectly invest a major portion of their wealth in government bonds/securities by making deposits with the commercial banks and other financial institutions. These deposits are equivalent to holding government bonds because these financial institutions, in turn, are statutorily required to hold a part of these public deposits in the form of government bonds, as a measure for ensuring a risk-free portfolio. Thus, one might say that banks act as agents of private households in holding government securities on their behalf. This portion of government debt is called market debt. It is the households and the corporates which save in long-term government bonds. It is also a case that households hold corporate equity and corporates hold government bonds in their capacity as the agents of households. The statutory liquidity ratio (SLR) forms only a part of market borrowings. Gratuity funds, and corporations, LIC, GIC, and other financial institutions - all hold government securities and all of them put together constitute market debt. Apart from market borrowings, government borrows from small savings (SS) and provident funds (PFs) too. All these components constitute government debt that amounts to bond-financing as these are funds from the private sector and hence are claims of the private sector and constitute a part of the wealth of the private sector. Other constituents of the government's domestic debt have been excluded from the components of domestic debt, as they do not form private sector's savings. For example, raising funds from railway reserves and telecommunication funds by the government do not constitute any claims for the private sector, as exactly is the case with small savings and provident funds. To the extent that the private sector utilises the borrowed money in constructing buildings or in acquiring new assets, the wealth variable proxied by M_1 minus demand deposits would underestimate the size of the total wealth of the private sector. In case of unavailability and unreliability of concrete data on total private wealth, the wealth variable represents liquid wealth of the private sector. The narrow money supply minus demand deposits plus government debt has been assumed to form the total liquid wealth of the private sector. The amount of demand deposits is subtracted from M_1 in order to avoid double-counting as the same amount of resources which get counted in the government debt, forming a part of wealth of the private sector, should not reappear as part of the liquid wealth of the private sector. This is done for the simple reason that the commercial banks and other financial institutions deploy a sizeable portion of public deposits in buying of government bonds. In other words, the government borrows from demand deposits of the private sector. There are studies, which consider private

capital stock as a proxy for private sector wealth. But there are also problems with this measure of private wealth. Private consumption would not be so much sensitive to a change in capital stock as to the change in liquid wealth.

19   We have a mixture of I(1) and I(0) variables. Banerjee et al. (1998)'s ECM-cointegration procedure is applicable when there are mixtures of integrated variables of different order. The ECM procedure involves testing the stability of the parameters. We have considered appropriate tabulated statistics for the ECM-cointegration test from Ericsson and MacKinnon (2002) who have provided critical values for any number of I(1) explanatory and deterministic variables in the models.

20   In such circumstances we report the results of either ECM to cointegration or DOLS where they pass the statistical criteria.

21   The long run coefficients are obtained by dividing the values of level variables with the coefficient of lagged dependent variable in the ECM equation.

22   When government borrows directly from the RBI, it does not constitute a part of the private sector's claim, so it may not form private sector wealth. Therefore, in order to know the differential impact of borrowing, two definitions of government borrowing is followed in the paper.

23   The user cost of capital is defined as the ratio of the price of capital goods to the prices of all other goods times the real interest rate on capital plus depreciation. The real interest is derived as the rate of interest minus the rate of inflation on capital inputs.

24   Even though the estimates do not pass all the diagnostic tests performed for obtaining the best estimates, still the signs of the estimates are relied on as they are consistent with the underlying theory and earlier estimates.

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