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Macroeconomic Determinants of Remittances: Evidence from India

Poonam Gupta

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European Department

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Prepared by Poonam Gupta¹

Authorized for distribution by Jerald Schiff

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Abstract

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Remittances to India have been growing rapidly since 1991, making it one of the largest recipients of remittances. This paper analyzes the determinants of remittances to India and finds that their growth over time can be explained by the increase in migration and total earnings of the migrants. Remittances are also affected by the economic environment in source countries, and appear to be countercyclical—that is, higher during periods of low economic growth in India. None of the remaining economic or political variables considered in the paper, including political uncertainty, interest rates, or exchange rate depreciation, are found to affect remittances significantly.

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Author(s) E-Mail Address: pgupta@imf.org

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I. INTRODUCTION

Remittances from abroad have become a very important component of the balance of payments for developing countries in recent years. For some countries they have exceeded various types of capital flows. *Global Development Finance* (GDF, 2003) shows that remittances to developing countries are higher than official aid flows and are also higher than most other types of private capital flows. Remittances have increased rapidly for India too in the past decade, making it one of the largest recipients of remittances in the world.²

Remittances to India more than quadrupled between 1991 and 2003 and totaled about US\$18 billion by 2003. The buoyancy of remittances has been instrumental in substantially reducing the current account deficit in the past few years. They have also been one of most stable flows in the balance of payments accounts of India. Remittances to India have increased at about 13 percent a year since 1991. The movement of remittances around the trend has been low, and therefore remittances have been the most stable type of external flows in India.

This paper analyzes the macroeconomic factors that might explain the dynamics of remittances to India. It finds that the structural factors that may help to explain the buoyancy of remittances during the 1990s, are the increase in the number of migrants to countries such as the United States, Australia, and Canada. In particular the number of Indian migrants to the United States doubled during the 1990s.³ Evidence also shows that the migration during this period consisted of more skilled people and professionals, and that it was accompanied by a sharp increase in the average earning of the migrants. It is also possible that the growth in measured remittances in the 1990s may have been partly due to informal channels of money transfer rendered less attractive by the exchange rate devaluations of the early 1990s, and the opening up of the capital account. Another possibility is that due to the reduction in duty on the import of gold, the illegal import of gold became less remunerative, resulting in remittances being channeled more through the official routes.

In order to explain the dynamics of remittances around the trend we analyze several economic and political variables, but do not find many risk-return type factors to be important in explaining the behavior of remittances around the trend. Though there is only weak evidence that remittances are countercyclical for India (higher during the years of drought), we find remittances to be higher when economic conditions in the host country are benign.

² Remittances (also known as current transfers) include worker's remittances and other private transfers on current account.

³ See Desai, Kapur, and McHale (2001).

The paper does not look at the macroeconomic impact of remittances flows or their welfare implications, but the general perception is that they have thus far been beneficial to India. Remittances have been crucial in improving the current account, and in the consequent buildup of foreign exchange in the last few years.⁴ They are probably also important from the social security point of view by providing a safety net to family members of nonworking age. The effect of remittances on output and employment generation would depend on the end-use of the transfers. The effect would be larger if remittances are geared more toward investment expenditure. If remittances are used for consumption, then the stimulation to production would come through the multiplier effect, especially if the economy is operating below capacity.⁵

The findings that remittances have increased at a trend rate in the last decade or so, in tandem with increased migration, and have been mostly stable, imply that in the years ahead the country's policies in the external sector may need to be adapted to absorb these sustained flows of remittances, especially to ensure that these flows do not create excessive liquidity in the economy or generate inflationary pressures. In particular it may be desirable to let imports rise to a similar extent as the incremental annual flows of remittances. This would help alleviate inflationary pressures and would also be desirable for liquidity management. Such a policy may be welfare enhancing overall.

The rest of the paper is organized as follows. Section II discusses issues related to the measurement of remittances and discusses the trends in remittances. Section III discusses the literature and the possible determinants of remittances. Section IV discusses and interprets the empirical findings of the paper, and Section V concludes.

II. MEASUREMENT ISSUES AND MAGNITUDE OF REMITTANCES

A. Definition and Measurement

The two main sources of data on private transfers to India are the Reserve Bank of India's databases—*Handbook of Indian Economy* and *RBI Bulletins*, in addition to the IMF's

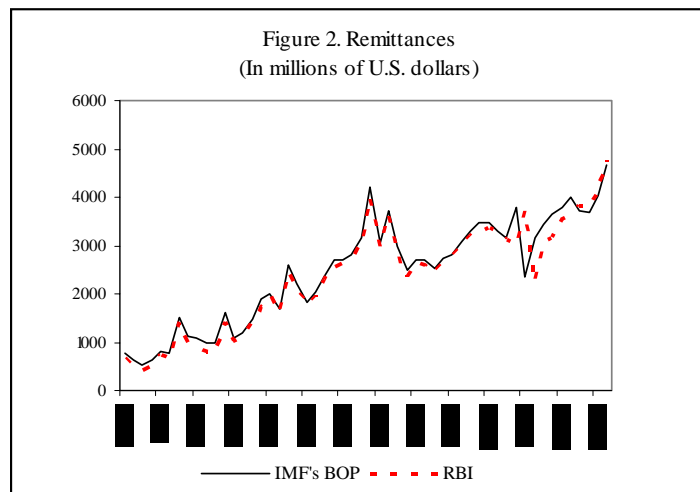
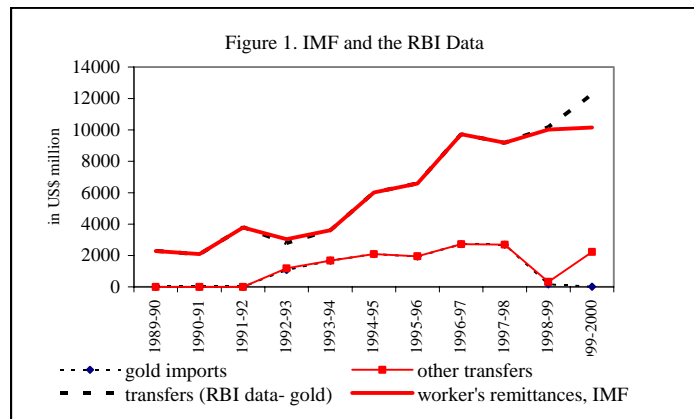
⁴ Since some of the remittances are likely to filter out of the economy through higher imports, the net impact on current account balance is perhaps smaller than the total flow of remittances.

⁵ Though we are unaware of any study on India that looks at the end-use of remittances, evidence from other countries shows that remittances are mostly used for consumption and for investment in land and property.

Balance of Payments Statistics (BOPS). The RBI's data on private transfers are available for the period 1990–2003, and the IMF's data are available for 1975–2002.⁶

The IMF's data are available separately for two components: worker's remittances and other transfers. As per the IMF's BOP manual, "worker's remittances" include transfers by migrants employed in new economies and considered residents there (i.e., they have stayed in the new economy for a year or more). "Other transfers" include charitable and religious contributions (including relief work), and gifts etc. The two components exhibit very different dynamics overtime.

Disaggregated annual data are also available in the RBI publications for the period 1990–2000. In order to get a better handle on different components of remittances, we try to reconcile the IMF data with the RBI data. As Table 1 and Figure 1 show, until 1999, "other transfers" in the IMF data seemed equivalent to the "import of gold" component of the RBI's data, and "worker's remittances" included all the other components of the RBI data. However, this practice seems to have changed in 1999, when there seems to be divergence in respective data series of the IMF and the RBI. In particular, since the gold imports in the remittances data are shown to be zero, and other transfers of the IMF show a rapid increase, it implies that starting in 1999 some other type of remittances are included under this heading.



⁶ We have used the data for gross transfers (i.e., we did not net out remittances paid) in the analysis, however, since the transfers paid are very small, the net and gross transfers do not differ much in India.

Table 1. Different Components of the Remittances Data in the RBI and IMF Databases
(In millions of U.S. dollars)

	Family Maintenance	Gifts and Donations	Repatriation of Savings	Gold and Silver	Local Redemptions of NRRR deposits	Other	Total Transfers - RBI data	Worker's Remittances -IMF data	Other Transfers -IMF	Total Remittances -IMF data
1989-1990	720	405	1,161	0	0	11	2,297	2,291	0	2,291
1990-1991	626	417	1,027	0	0	14	2,084	2,092	0	2,092
1991-1992	702	344	2,738	0	0	13	3,797	3,792	0	3,792
1992-1993	730	445	1,604	1,076	0	9	3,864	3,049	1,181	4,230
1993-1994	514	838	2,241	1,670	0	24	5,287	3,617	1,670	5,287
1994-1995	1,727	587	3,665	2,100	0	33	8,112	6,013	2,100	8,113
1995-1996	1,003	1,359	4,198	1,943	0	37	8,540	6,588	1,948	8,536
1996-1997	2,518	726	1,935	2,718	3,427	1,111	12,435	9,719	2,716	12,435
1997-1998	5,232	526		2,699	3,418		11,875	9,178	2,699	11,878
1998-1999	7,661	650		171	1,859		10,341	10,012	331	10,343
1999-2000	7,423	734		13	4,120		12,290	10,151	2,237	12,388

Sources: RBI Bulletins, and the IMF BOPS.

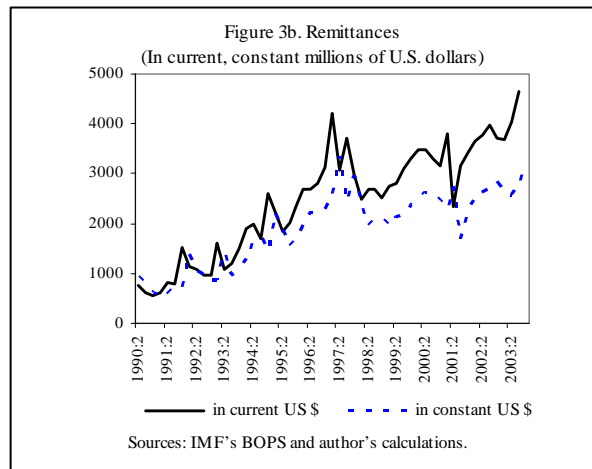
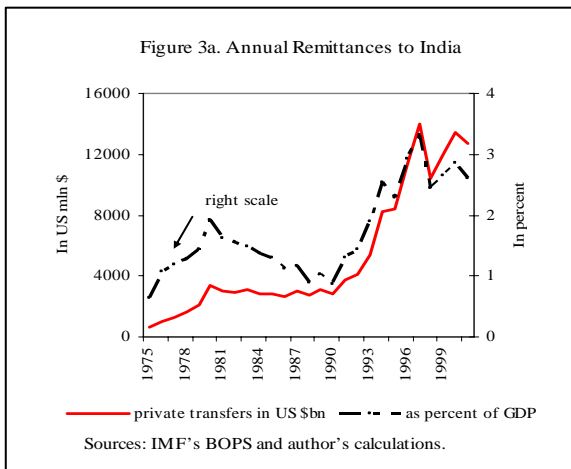
The lack of clarity and a possible break in the series makes time series analysis of the disaggregated data difficult. Therefore we focus only on total remittances in the paper. We use the IMF data for our analysis since, as Figure 2 shows, the total transfers data of the RBI and the IMF match quite well.

One limitation of the reported data for remittances is that it is probably underestimated because it does not include remittances sent through informal channels. Such transactions are often known as “hawala” (see El-Qorchi, 2002). In some countries these flows are estimated to be very high. For India estimates have put the remittances through hawala at about US\$6 billion a year (Reddy (1997)).

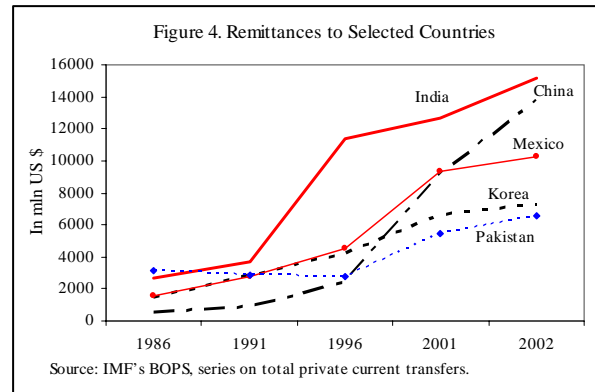
Finally, if the remuneration to bring money through hawala changes overtime, this would result in discrete jumps in the reported figures on remittances, making the time series data less comparable over time. This is likely to happen e.g., if the official exchange rate is aligned more closely with the shadow exchange rate; or if the rules on declaration of remittances become more stringent, thus inducing the agents to remit funds through the official channels. This probably happened in India in the 1990s and in the post-September 11, 2001 period (we include exchange rate depreciation and a dummy for the period after the September 11, 2001 to account for these events in the regressions later).

B. Magnitude and Trend of Remittances

Private transfers have become an important component of the balance of payments in India since 1991. Figure 3 shows that the transfers increased steadily during the 1970s, remained more or less flat in the 1980s and picked up sharply in the 1990s. The sharpest increase in transfers took place during 1991–1997. Remittances to India more than quadrupled between 1991 and 2003, and totaled about US\$18 billion in 2003, making India one of the largest recipients of remittances. In terms of percentage of GDP, remittances equaled about 3 percent in 2003.

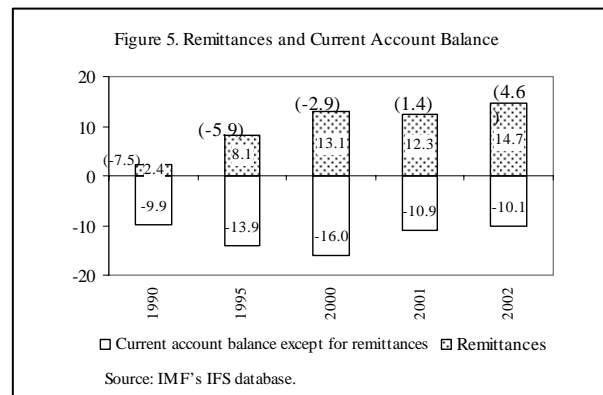


Remittances have increased in tandem with the increase in remittances to other developing and emerging countries, a reflection of increased globalization and the associated movement of people. However, the increase in remittances has been somewhat sharper to India than to many other countries (Figure 4). Another country where the remittances have increased at a similar pace in the past decade is China. India accounted for about 10 percent of total remittances to developing countries, and about 25 percent of total remittances to Asian countries in 2002.



Remittances have been an important component of India's current account, accounting for about 1/2 of the receipts on invisibles and 20 percent of the total receipts in the current account in 2002. Increased remittances, coupled with an improved trade balance, have been instrumental in the recent improvement of the current account of India.

One issue which often figures in the discussion of external flows is the sustainability or volatility of these flows. An important feature of remittances is that they have proven to be one of the most stable forms of external flows to India, on current as well as on capital account. Jadhav (2003) shows that the volatility of remittances is lower than that of Non Resident Indians (NRI) deposits or portfolio flows. In addition we find that remittance receipts are also substantially less volatile than exports of goods and services.



III. LITERATURE AND DETERMINANTS OF REMITTANCES

In the literature several issues related to international migration, and more specifically issues related to remittances have been studied, such as estimating the impact of migration on domestic economy (in terms of lost human capital or tax revenue); analyzing the incentives behind remittances (for support of family, or investment purposes); and assessing the effects of the remittances on the native country (effects on the balance of payments and growth). The literature broadly distinguishes between an altruistic motive to remit earnings to the migrant's native country (mostly for consumption by the family), and remittances sent to either invest in the native country or to repay previously borrowed funds.⁷

⁷ See Chami et al. (2003) for a detailed discussion of these issues.

In order to analyze the dynamics of remittances one can think of an optimizing framework whereby a migrant maximizes his utility by choosing the optimal level of his own consumption, remittances to family in his native country for their consumption needs, and investment in various available instruments in the native country as well as in the host country. Remittances to support family members at home would depend on the income of the migrants, and on the needs and income of the beneficiaries.⁸ Remittances for investment (in deposits, property, stocks etc.) would be influenced by risk-return considerations. Determinants of remittances such a framework imply are: income of the migrant, economic conditions in the native country (migrants are likely to remit more during the periods when their family's income is low); return factors including domestic interest rates, interest rates abroad, and return in the stock market or return on property; and the risk of default, which could be proxied by domestic political uncertainty, geopolitical conditions, or rating downgrades.

The main results established in the literature are: remittances are motivated more by an altruistic motive than by an investment motive; remittances are counter-cyclical, i.e., higher under adverse economic outcomes in the native country; they are used more for consumption than for investment; and they do not respond much to relative rates of return on investments in home country.⁹

A. Explanatory Variables

In the econometric exercise below we include movements in U.S. employment (nonagricultural employment), LIBOR, or oil prices, as proxies for the economic environment in the host countries. For economic conditions in India we consider variables such as industrial growth, a dummy for drought years (defined as a year when the agricultural growth is negative), or return on the Bombay Stock Exchange (BSE). We also include agricultural or GDP growth rates, though quarterly data are available only since 1997.

For risk factors we include dummy variables for rating downgrades by leading credit rating agencies, for government resigning mid-term, and for periods of geopolitical tensions on the border with Pakistan.¹⁰ We also include a dummy for the Asian crisis period. This period also

⁸ Researchers have used either the household level data (e.g., Lucas and Stark (1985) or the aggregated macro level data (e.g., Chami et al. (2003), Straubhaar (1986)) to analyze the possible determinants and effects of remittances.

⁹ Evidence on the contrary is found in Straubhaar (1986), who finds remittances to Turkey to be sensitive to temporary domestic political instability. He also finds that remittances do not respond strongly to the incentives offered to migrants to remit.

¹⁰ Similar variables have been used by Gupta and Gordon (2003, 2004) to analyze the determinants of NRI deposits and portfolio flows.

coincided with the issuance of the Resurgent Indian Bond (RIB) yielding an attractive interest to Indians abroad.

Since remittances are likely to be higher during the periods of festivals or marriages we also test for the robustness of our results by including a separate dummy for the October-December and April-June periods as these coincide with either the period of major festivals or with the auspicious months of wedding season (we also tested for seasonality of the quarterly remittances data but found that the data do not exhibit a seasonal pattern).

In addition, we control for a dummy variable for the post-September 11, 2001 period in the regressions to reflect the effect of strengthening of regulations and a clampdown on hawala transactions after September 11.

Since a depreciation of currency would render remittances more profitable, align the official exchange rate closely with the black market exchange rate, or even raise expectations of an appreciation in the future, it would probably increase remittances sent through the official channels. However, since there is a potential endogeneity in the depreciation and remittances variables (more remittances would imply stronger rupee), we include lagged values of the exchange rate depreciation.

Further details on data sources and on construction of variables are provided in the Appendix.

B. Bivariate association between Transfers and other variables

Remittances transfers are not found to be correlated significantly with most of the variables, except U.S. nonagricultural employment (Table 2). (The coefficients are also found to be insignificant for most of the variables in multivariate regressions.) We also do not find the transfers during some of the events—such as geo-political tensions, or the aftermath of September 11, to be significantly different than during the rest of the period (Table 3). Remittances were lower during the Asian crisis; however since this period also coincides with other events, including the issuance of the RIB, the effect of Asian crisis can not be isolated.

Table 2. Correlation Coefficients Between Dependent and Independent Variables¹

	Remittances: HP Filtered	U.S. Employment: Percent Change	Oil Price: Percent Change	Nasdaq: Percent Change	FII	LIBOR: Change	Exchange Rate: Lagged Percent Change	Drought Percent Change	BSEC: Percent Change	RIB	S11	ASIA	RATE
Remittances:	1												
HP filtered													
US employment	0.24	1											
Oil price	0.05	0.15	1										
Nasdaq	0.09	0.21	-0.20	1									
FII	0.22	0.70	0.37	0.11	1								
LIBOR	0.27	0.32	0.06	0.08	0.25	1							
EXCC(-1)	0.01	-0.11	-0.01	-0.07	-0.22	-0.30	1						
DROUGHT	0.18	-0.17	-0.02	-0.16	-0.23	-0.09	0.23	1					
BSEC	0.15	-0.07	0.20	0.23	0.08	0.13	-0.06	-0.05	1				
RIB	-0.14	0.16	-0.09	0.01	-0.03	-0.32	0.04	-0.19	-0.17	1			
S11	0.08	-0.44	0.02	-0.27	-0.16	-0.20	-0.07	0.07	-0.08	-0.07	1		
ASIA	-0.18	0.19	-0.23	0.01	-0.03	-0.33	0.14	-0.08	-0.18	0.86	-0.08	1	
RATE	-0.01	-0.12	-0.32	-0.11	-0.21	-0.29	0.07	0.06	-0.14	0.32	0.06	0.44	1

Source: Author's calculations.

¹A coefficient higher than 0.23 is significantly different from zero at a 10 percent level.

Table 3. Quarterly Average of Remittances During Specific Periods

	Period and duration	Remittances (HP filtered)
All		-6.89
Drought	1991:2-1992:1, 1995:2-1996:1, 1997:2-1998:1, 2000:2-2001:1, 2002:2-2003:1	65.3
Rating	1991:2, 1997:1, 1997:4, 1998:1,2,4; 2000:4, 2001:3,4	-35.7
Asia	1998:1-1998:4	-315.8**
Geo-Polt	2002:1	42.6
S11	2001:4, 2002:3	48.3

Note: Calculated for HP residuals. *, **, *** indicate significance at 1, 5,10 percent levels respectively.

IV. ECONOMETRIC SPECIFICATION AND EMPIRICAL RESULTS

A. Time Series Properties

We first test the time series properties of the variables, which in turn would determine the regression specification. The dependent variable was found to be an I(1) process (test for unit root was conducted for the specification including a constant and a trend). Similarly the variables related to migration were found to be an I(1) process. However the test ruled out the presence of a cointegrating relationship between these two variables. Other variables measured in levels, such as oil prices and U.S. employment were also found to be I(1) processes, but the tests ruled out cointegrating relationships between these variables and remittances. However, the variables which were measured in first differences, as percentage changes, or as deviation from a HP trend were found to be I(0) processes (see Table 4).

Table 4. Results of Unit Root Tests

	D-F Statistic	P value
Remittances (in constant US\$)	-2.38	0.39
HP filtered Remittances	-4.2	.00
Earnings of migrants (in constant US\$)	-2.69	0.24
US nonagricultural employment	-2.34	0.40
US nonagricultural employment (in % change)	-1.96	0.29
Oil prices (in constant US\$)	-2.84	0.18
Oil prices (in % change)	-4.03	0.00
LIBOR (quarterly change)	-2.48	0.12
Nasdaq (in percent change)	-3.03	0.03

B. Econometric Specification

We estimate the following two specifications of the regression equation:

$$\text{Trans}_t = c + \alpha \text{trend}_t + \sum_i \beta_i X_{it} + \varepsilon_t, \quad \varepsilon_t \approx N(0, \sigma^2), \quad t = 1, 2, \dots, T \quad (1)$$

$$\text{Res1} = c + \sum_i \beta_i X_{it} + \varepsilon_t, \quad \varepsilon_t \approx N(0, \sigma^2), \quad t = 1, 2, \dots, T \quad (2)$$

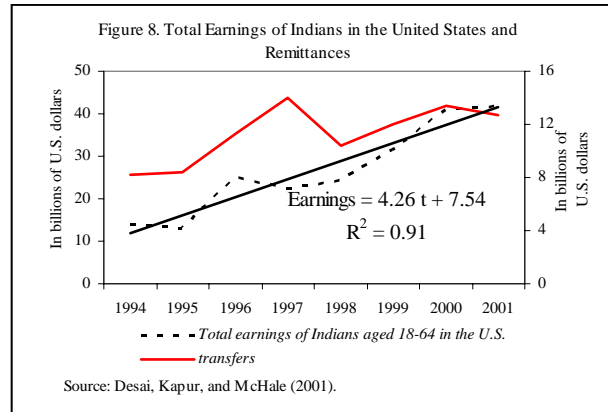
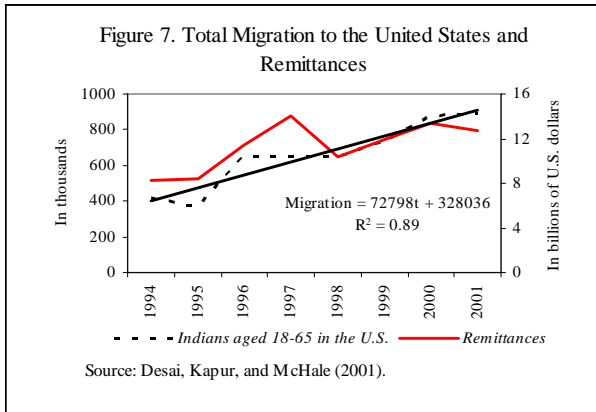
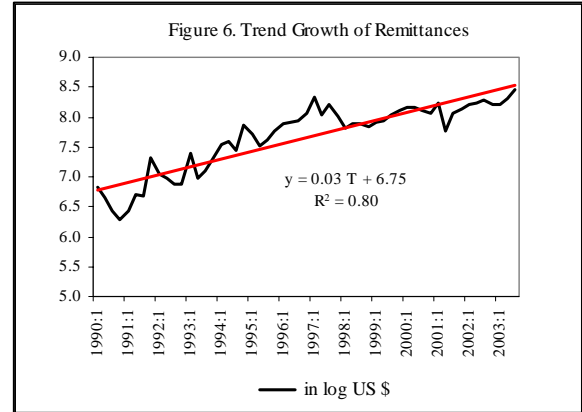
Our dependent variable is measured in constant U.S. dollar. In the first specification (Equation 1) we regress remittances on a linear trend and a set of explanatory variables in order to explain the trend in the series. In the second specification (Equation 2) we estimate the de-trended series for transfers (the HP filtered series). The estimates are obtained either

through Ordinary Least Squares, with heteroskedasticity consistent standard errors; or if there is autocorrelation through an AR1 specification.¹¹

C. Linear Trend

Remittances exhibit a strong linear trend (Figure 6).

The factors that may explain the buoyancy of remittances over time include the increase in the pool of Indians settled abroad, and the fact that the migration consists increasingly of the more skilled people, and therefore people with higher average earnings. As mentioned earlier, the spurt in the early 1990s may also be due to the informal channels of money transfers being rendered less attractive with the realignment of the exchange rate in the early 1990s, the opening up of the capital account; and the reduction in duty on import of gold which probably made illegal import of gold less remunerative.



¹¹ Jadhav (2003) analyzes the determinants of worker's remittances to India. Using a log linear regression specification, he includes oil prices, US GDP, an interest rate variable (difference between NRI interest rate and LIBOR) and exchange rate depreciation as the explanatory variables. He finds remittances to be associated positively with the oil prices and an exchange rate depreciation. The analysis in this paper differs from Jadhav (2003) in many important aspects. First, we use either stationary variables or include lagged values of the I(1) variables in the regressions in order to eliminate the problem of spurious regressions. Second, we use a more complete specification by including a trend and/or the variables on the RHS which may explain the trend behavior in remittances. Finally, we include a somewhat more comprehensive set of explanatory variables.

The results for specification in equation 1 are reported in Table 5. The first column shows that the series for remittances exhibits a very strong liner trend. In order to explain the trend we include either the number of migrants (we use the data on migrants in the United States, and interpolate the quarterly series from annual data, and measured in log) or their average earnings abroad (proxied by the average earnings in the United States, quarterly data interpolated from annual data). However only few observations are available for these variables, nevertheless results (column 2 Table 3) show that the migration/earnings of migrants explain the trend in remittances. We also include oil prices, however its coefficient is insignificant. Since the dependent and independent variables in levels are all I(1) processes, with no conintegrating vector, we include lagged values of all the variables in the regressions.

	I	II	III	IV
C	2.25*** (3.07)	3.16 (2.06)	2.17 .96	-1.5 (-1.06)
trend	.008*** (3.01)	.001 (.33)	-.00 -.64	-.004 (-.82)
Lagged dependent variable	.67*** (6.38)		.13 (.64)	.03 (.16)
Earnings of migrants in the U.S.		.58*** (2.74)	.65 (-1.08)	-.69 (-1.2)
Lagged Earnings of migrants in the U.S.			1.25** (1.99)	1.29** (2.10)
Oil prices				.39 (.36)
Oil prices lagged				.57 (.50)
Number of observations	53	29	28	29
R ² , Adj. R ²	.84, .83	0.50; 0.46	.60; .54	0.55; 0.50

Note: Dependent variable is log of remittances (in constant US\$); log of total estimated earnings of the Indian migrants in the U.S. (in constant US\$). Estimates obtained from OLS, with heteroskedasticity consistent standard errors. Since the variables are I(1) their lagged values are included in the regression.

D. Regression results for HP filtered series

Next we estimate the equation for HP filtered series for remittances. In the regressions (Table 6), the variables which are found to be significant are either variables which measure the state of the U.S. economy (U.S. nonagricultural employment, changes in labor, oil prices, and the return on NASDAQ are used as the proxy for the source country's business cycle conditions), or that of the Indian economy. Remittances are found to be higher when the economic conditions in the source country are benign. Results also show that the remittances are higher during drought years, though this results is somewhat weaker, as it is not obtained in all the specifications.

The only other variable which we find to be important in the regressions is the dummy for the period around the Asian crisis, which has a negative coefficient and is significantly different from zero. This may be due to the uncertainty around the Asian crisis, or due to expectations of a depreciation of the rupee. Around the same time the RBI had floated a high yielding RIB to attract investments from the non resident Indians. The negative effect on remittances during the Asian crisis may also be due to the diversion of remittances into these bonds. However this explanation is probably not valid because we do not find interest rate on NRI deposits, or changes in the policies regarding NRI deposits (especially since 2002) to be correlated significantly with the behavior of remittances.

Table 6. Regression Results for the Cyclical Component of Remittances

	I	II
C	-.04 (-1.22)	-.076** (-1.98)
Percent change in Non agricultural employment in the U.S.		.13** (2.04)
Percent Change in oil prices	-.001 (-.59)	-.001 (-.44)
Drought	.082* (1.89)	.057 (1.15)
Change in LIBOR	.10* (1.74)	
Asian crisis	-.11** (-2.12)	-.16* (-1.67)
Rho		.17 (1.16)
Numbers of observations	53	54
R ² , Adj. R ²	.13;.06	.16;.07

Note: Dependent variable is Hp filtered series of log of remittances (in constant US \$); in column I above an OLS specification (with heteroskedasticity consistent errors were used); in column II the OLS specification indicated presence of autocorrelation, therefore an AR1 specification is used.

Remittances are also not found to be affected by the movement of the oil prices. This is despite the fact that a nontrivial percentage of remittances to India originate from Middle Eastern oil-producing countries. This could possibly be due to the fact that oil price changes have off-setting effects—higher oil prices may result in higher income and more remittances from the oil producing countries, but may negatively impact the economies in other source countries, and lower remittances originating from there.

Several other economic and political variables were included in the regressions but their coefficients were not found to be important, including rating changes, return on domestic stock market, and exchange rate changes. Finally, we did not find exchange rate variables to be significant, and neither did the period since September 11, 2001 witness any unusual pattern in remittances.

V. CONCLUSION

This paper analyzes the recent behavior of remittances to India. It finds that commensurate with the increase in the number of migrants from India and the migration of high skilled worker's over time, private transfers to India on current account have been very robust in the past decade. The paper also finds that the private transfers have been a stable source of funds and have not been affected by the risk-return considerations to the same extent that flows on capital account have been, such as portfolio investment or even NRI deposits. Thus they have proven to be a source of strength in the balance of payments in India.

The econometric analysis shows that not many macroeconomic factors are important in explaining the behavior of remittances around the trend overtime. Among the variables that are found to be significantly associated with the movements in remittances include indicators of economic activity in the source countries. Remittances are higher when economic conditions abroad are benign, and remittances are also found to be somewhat counter cyclical, that is, higher during the periods of negative agriculture growth.

The paper does not look at the contribution of remittances to the economic development or their welfare implications. For this issue to be addressed fully it may be useful to examine more disaggregated data.

Data Sources and Definitions

<i>Variable Name</i>	<i>Definition/Construction of Variable</i>	<i>Source</i>
Remittances	Private transfers on current account, expressed in constant US\$	IMF, BOPS
Drought	Dummy takes a value 1 if it is a drought year—i.e., agricultural growth is negative	Constructed using the data on Agriculture growth
LIBOR, change in LIBOR	12 month LIBOR in US\$, change in LIBOR	IFS
Return on Nasdaq	Quarterly return on Nasdaq, percent change in Nasdaq	Constructed using the data from IFS
Asian crisis	Dummy takes a value 1 for the quarter in which crisis occurred in Asia	Constructed using IFS exchange rate data
Percent change in oil prices	Percent change in Oil prices in constant US\$	Calculations using data from IFS
S11 dummy	Dummy variables take a value one for four quarters after September 2001	Constructed
Return on BSE	M-o-m percentage return in BSE index in dollar terms	Handbook of Statistics, RBI
Exchange rate change	Quarterly percentage change in exchange rate with respect to US dollar	IFS
Political uncertainty	Dummy equals 1 in the quarters during which the central government resigned mid-tem	Dow Jones Newswire
Geo-political tensions	Dummy takes a value 1 for the quarters of Kargil war, nuclear tests, and border stand-off in summer 2002.	Dow Jones Newswire
Rating changes	Dummy equals one for the quarters in which the rating/outlook is revised down, and the following month	Constructed using information from S&P, Moody's
Issuance of RIB, IMD bonds	Dummy equals one for the quarters in which RIB, IMD were issued	Constructed

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