

# Role of Remittance in Economic Development of Nepal

Nagendra Lal Srivastava  
Shashi K. Chaudhary

## ABSTRACT

*This article deals with the analysis of direct impact of remittance on three development indicators viz. GDP, GNP and PCI of the nation which are also the dependent variables of the proposed models. The analysis has been carried out with linear and log-linear models under multiple regressions. The impact of remittance has been seen most remarkable in the GDP and GNP both in nominal and real terms. In the nominal GDP and GNP, the remittance shows 61 percent and 72 percent impact respectively while in real term it shows 48 percent and 55 percent respectively. It has also shown positive impact on the PCI but it is comparatively low (four percent in nominal and one percent in real terms). The growth rates of independent variables (Rm, K, L and X) have also been tested in the same model to find the effects on the dependent variables. The findings are positive except for labor force, but they are marginal which show that remittance has not been used effectively so as to increase the real growth rates of the economy.*

**Key words :** remittance, economic development, GDP, GNP

## 1. Introduction

Nepal's development expenditures are heavily financed by foreign aid and it has become an integral part of Nepal's political economy. Besides foreign aid, tourism sector also remained one of the lucrative sectors for Nepal. But, in FY 2001/02, Nepal's major economic activities: tourism, manufacturing, investment, exports etc. reported major downslides and even agricultural production and imports slackened. Since then the source of earnings for sustaining Nepalese economy remained either foreign aid or remittance that has been paving the way from the economic disaster. Employment abroad has not only helped Nepal in minimizing ever growing unemployment problem; it has also injected much needed foreign currency into our economy to fill up foreign exchange and investment gap, thereby helping Nepal avoid a major balance of payment crises (Sigdel, 2005:26). In spite of a common consensus within the government and development agencies that there is great potential of the overseas migration as a safety valve in view of gloomy economic scenario, 'the remittance economy of Nepal' has generally been either ignored or underestimated by economists, academics and policy makers.

In true sense, the contribution of remittance to the national economy is much larger than what is reflected by official data and information. Hence, the main objective of this article is to examine the role of remittance in economic development of Nepal.

## 2. Hypotheses

Keeping the objective of the study in view, the following hypotheses have been set:

- i.  $H_0$  : The role of remittance is not significant in economic development of Nepal.  
 $H_1$  : The role of remittance is significant in economic development of Nepal.
- ii.  $H_0$  : The present expenditure pattern is productive.  
 $H_1$  : The present expenditure pattern is not productive.

### 3. Methodology

This study is based on the econometric analysis of secondary data of the past 30 years, i.e. from FY 1975/76 to 2004/05. These have been abstracted from Economic Survey 1998/99, 2000/01 and 2005/06 of MOF, Government of Nepal. The relationship between dependent and independent variables has been analyzed by applying the OLS method under which parameters have been estimated via multiple regression models. Then t-test, F-test, DW-test and coefficient of determination have been computed by using SPSS software.

In multiple regression models GDP, GNP and PCI have been taken as dependent variables while Rm, K, L and X have been taken as independent variables. In addition, the association of these dependent variables is also seen with FA and FET taken together with Rm. In real ground, these dependent variables are influenced by many other independent variables also but they are eliminated in this analysis as they are not so much influential.

The linear and log-linear models have been used to observe the impact of remittance on the dependent variables. The data in current prices and constant prices have been tested in the following models:

$$Y = a_1 + a_2Rm + a_3K + a_4L + a_5X + u_i \quad \dots\dots\dots \text{(basic model)}$$

Where Y = GDP, GNP and PCI in nominal and real terms

$a_1$  = y-intercept

$a_i$  (i=2,3,4,5) = Regression parameters and

$u_i$  = error terms

And  $X = a_1 + a_2Rm + a_3FA + a_4FET + u_i \quad \dots\dots\dots \text{(supportive model)}$

Where X = Nominal GDP, Nominal GNP and Nominal PCI

#### 4.1 Regression Results and Interpretation of Nominal and Real GDP, GNP and PCI

For nominal GDP, the linear model seems good fit having higher  $R^2$  (=0.998) and F-statistic being significant at one percent level ( $\alpha=0.01$ ). The coefficients of the independent variables have positive values indicating their positive association with the nominal GDP. The coefficient of remittance is 0.61 which indicates that 100 percent increase in remittance income brings 61 percent increase in the nominal GDP of Nepal. It implies that if the amount of remitted money reaches NRs 100 million, it will increase the country's nominal GDP by NRs 61 million. This shows how important remittance has become for Nepal.

In comparison to it, the coefficients of capital formation and exports are very high (3.42 and 1.24) implying their multiplier effects. An increase of NRe1 in capital formation leads nominal GDP increase by NRs 3.42. Similarly, NRe1 increase in total export increases nominal GDP by NRs 1.24. Thus, these two variables are also very responsive. Further, these coefficients are significant at one percent level ( $\alpha=0.01$ ) and also the DW statistic (=1.75) lies above critical upper value supporting absence of serial correlation. These facts confirm the reliability and validity of model [ $d_L=0.94$ ,  $d_U=1.51$  for  $k=4$  and  $n=30$  at  $\alpha=0.01$ ] (Table 1.a).

The findings of linear model are supported by log-linear model also in which the elasticity coefficients are also positive for all independent variables. But the degree of association is different. It shows that one percent increase in remittance increases nominal GDP by 0.06 percent only which might be considered a very low value. This value contradicts the finding of share of remittance in the linear model. Therefore, the log-linear model has not been included in the main text<sup>3</sup>.

In the similar framework, the association of nominal GDP is also studied with foreign aid and foreign exchange earned from tourism. The coefficient of remittance is seen highly responsive to the nominal GDP. It is 2.16 which mean that NRs 100 increase in remittance income would lead the nominal GDP to increase by NRs 216. This indicates the multiplier effect of remittance in the national economy. The coefficients of foreign aid and foreign exchange earned from tourism are also found highly responsive (11.70 and 6.89 respectively) to the nominal GDP. But especially in a condition like Nepal faced just a couple of years before, the role of remittance is highly appreciable. Because of peace problem and political instability in the nation, the tourism sector had paralyzed and the donor countries had withheld their aid to Nepal. In that situation, the nation's economy survived only because of remittance income. That's why; the nation's heroes are not the leaders who are ruling but those unknown people who are working abroad and sending money back to their families in Nepal.

The t-values of all parameters and F-values of the model are found significant at one percent level ( $\alpha=0.01$ ). The DW statistic is also significant ( $d > d_u$ ) at one percent level suggesting absence of autocorrelation (Table 1.b).

The data have also been analysed in constant price taking FY1974/75 as base year. The model has high degree of explanation relating to the dependent variable as its  $R^2$  is 0.991. The t-statistic of all the coefficients and F-statistic of the model are found significant at one percent level ( $\alpha=0.01$ ) except the real export whose coefficient is significant only at five percent level ( $\alpha=0.05$ ). The coefficients of the independent variables are found positive showing their positive association with real GDP. The DW statistic is 0.98 which lies within the indecisive region and leads to suggest for other new tests of autocorrelation [ $d_L=0.94$ ,  $d_U=1.51$  for  $k=4$  and  $n=30$  at  $\alpha=0.01$ ].

The coefficient of real remittance is found to be 0.48 which is a considerable value. It means that NRs 100 increase in the real value of remittance would lead the real GDP to increase by NRs 48. Though this value lies at third place as gross real capital formation occupies first (1.84) and real export value occupies second position (1.08), yet in the situation when the value of total export is fluctuating and the gross capital formation is almost constant the role of remittance becomes dominant (Table 1.c).

For nominal GNP, the linear model seems good fit having higher  $R^2$  (=0.998) and F-statistic being significant at one percent level ( $\alpha=0.01$ ). The coefficients of the independent variables have positive values indicating positive association with the nominal GNP. The coefficient of remittance is 0.72 which indicates that 100 percent increase in remittance income brings 72 percent increase in the nominal GNP of Nepal. This shows how important

<sup>3</sup>  $\ln GDP_c = 3.08 + 0.06 \ln R_m + 0.61 \ln K + 0.34 \ln L + 0.14 \ln X$      $R^2$      $SEE$      $F$      $DW$   
 (9.22)\*    (2.12)\*\*    (5.87)\*    (0.67)    (2.57)\*\*    .998    0.052    3783.3\*    1.47

remittance has become for Nepal. In comparison to it, the coefficients of capital formation and exports are very high (3.51 and 1.51) implying their multiplier effects. Just NRe1 increase in capital formation leads GNP increase by NRs 3.51. Similarly, NRe1 increase in total export increases GNP by NRs 1.51. Thus, these two variables are also very responsive. Further, these coefficients are significant at one percent level and also the DW statistic (=1.86) lies above critical upper value supporting absence of serial correlation. These facts confirm the reliability and validity of model (Table 1.d).

The findings of linear model are supported by log-linear model also in which the elasticity coefficients are also positive; but the degree of association is different. It shows that one percent increase in remittance increases GNP by 0.06 percent only which might be considered a very low value. This value contradicts the finding of share of remittance in the linear model. Therefore, the log-linear model has not been included in the main text <sup>4</sup>.

In the similar framework, the association of nominal GNP is also studied with foreign aid and foreign exchange earned from tourism. The coefficient of remittance is seen highly responsive to the nominal GNP. It is 2.42 which mean that NRs 100 increase in remittance income would lead the nominal GNP to increase by NRs 242. This indicates the multiplier effect of remittance in the national economy. The coefficients of foreign aid and foreign exchange earned from tourism are also found highly responsive (12.25 and 7.52 respectively) to the nominal GNP. But especially in a condition like Nepal faced just a couple of years before, the role of remittance is highly appreciable.

The t-values of all parameters and F-values of the model are found significant at one percent level ( $\alpha=0.01$ ). The DW statistic is also significant at one percent level suggesting absence of autocorrelation [ $d_L=1.01$ ,  $d_U=1.42$  for  $k=3$  &  $n=30$  at  $\alpha=0.01$ ] (Table 1.e).

The data have also been analysed in constant price in linear model taking FY 1974/75 as base year. The model has high degree of explanation relating to the dependent variable as its  $R^2$  is 0.992. The t-statistic of the coefficients of gross capital formation and total labor force are found significant at one percent level ( $\alpha=0.01$ ) while that of the remittance and total export are found at five percent level ( $\alpha=0.05$ ). The F-statistic of the model is also found significant at one percent level. The coefficients of the independent variables are found positive showing their positive association with real GDP, but the DW statistic is 0.90 which lies below the lower limit of the critical value and leads to suggest the presence of autocorrelation [ $d_L=0.94$ ,  $d_U=1.51$  for  $k=4$  and  $n=30$  at  $\alpha=0.01$ ] and hence it needs the remedial measures (Table 1.f).

After diagnosis of the autocorrelation, though the explanatory degree of the model has decreased slightly ( $R^2=0.973$ ), the model is now free from the presence of autocorrelation. The F-statistic is significant at one percent level ( $\alpha=0.01$ ) confirming the goodness of fit of the model. The coefficients of the parameters are positive showing their positive impacts on the real GNP; but the t-statistic of total labor force only is found significant at one percent level and rests are insignificant within 10 percent level ( $\alpha=0.10$ ).

The coefficient of real remittance is found to be 0.55 which has remained the same as in the basic model. It is of course a considerable value which depicts that NRs 100 increase

---

<sup>4</sup>  $\ln GNP_c = 2.94 + 0.06 \ln Rm + 0.60 \ln K + 0.45 \ln L + 0.14 \ln X$      $R^2$      $SEE$      $F$      $DW$   
 (8.69)\*    (2.21)\*\*    (5.77)\*    (0.86)    (2.52)\*\*    .998    0.053    3833.6\*    1.31

in the real value of remittance would lead the real GNP to increase by NRs 55. Though the coefficient of real remittance is less than that of gross real capital formation (1.27), it is surprisingly greater than that of the real export (0.18). Hence, it highly supports the hypothesis of the study. This puts forward the increasing and dominating role of remittance income in economic development of the nation.

For the nominal PCI, the coefficient of remittance income in the linear model is found negative which is unexpected and surprising. It is -0.03 which depicts that an increase of NRs 100 remittance will decrease the nominal PCI by NRs 3. It requires a deep research to analyse the negative impact of remittance on the nominal PCI. Though the shares of gross capital formation, labor force and export are seen positive as expected, the linear model is excluded from the main text<sup>5</sup>.

From the statistical point of view, both linear and log-linear models are seen good fit having R<sup>2</sup> equal to 0.998 and 0.999 respectively. The t-values of all the parameters and F-values of both models are also found significant within five percent level (α=0.05). However, the DW statistics of both the models lie within the indecisive region suggesting need of some other tests for autocorrelation.

Here, the log-linear model is seen economically meaningful. The elasticity coefficient of remittance is seen here 0.04 which is very small and tends to reveal that NRs 100 increase in remittance income will increase nominal PCI only by NRs 4. However, this value seems close to the reality in light of the fact that nominal PCI of Nepal has not grown significantly over a decade while the remittance amount has increased by many folds. The elasticity coefficient of gross capital formation is 0.59 and that of the total export is 0.14 which indicates the greater responsiveness of these independent variables to nominal PCI. But the negative elasticity coefficient of the labor force (-0.24) once again puts the view that the total population of Nepal is more than optimum level and percentage of children in the total population is high. This logic is also supported by the report of population census 2001 in which the share of population below 15 years is 39.35 percent. A large number of children in the population entail a heavy burden on the economy because these children simply consume and do not add to the national product. Another factor is the low expectancy of life which means that there are more children to support and few adults to earn thereby bringing down the per capita income. Whatever increase in national income takes place that is nullified by the increase in population (Table 1.g).

In the similar framework, the association of nominal PCI is also studied with foreign aid and foreign exchange earned from tourism. The coefficient of remittance is 0.06 which mean that NRs 100 increase in remittance income would lead the nominal PCI to increase by NRs 6. This is of course positive but it can not be said highly responsive. However, it supports the hypothesis that remittance income brings positive impact in the nominal PCI of Nepalese people. The coefficients of foreign aid and foreign exchange earned from tourism are found comparatively highly responsive (0.58 and 0.34 respectively) to the nominal PCI.

The t-values of all parameters and F-values of the model are found significant at one

---

<sup>5</sup>  $PCI = -4382.73 - 0.03Rm + 0.12K + 860.10L + 0.12X$      $R^2$      $SEE$      $F$      $DW$   
 (-4.60)\*    (-3.73)\*    (9.74)\*    (6.03)\*    (6.41)\*    .998    325.05    3327.7\*    1.22

percent level ( $\alpha=0.01$ ). The DW statistic is also significant ( $d > d_u$ ) at one percent level suggesting absence of autocorrelation. These facts together confirm the reliability and validity of the model (Table 1.h).

The data have also been analysed in constant price in log-linear model taking FY 1974/75 as base year. The coefficients of the independent variables are found positive showing their positive association with real PCI except the coefficient of the labor force which is negative (-0.15). This indicates that, the other variables remaining constant, unit percent increase in the total labor force would decrease the real PCI by 0.15 percent. The coefficient of real remittance income is very low (0.01) which depicts that a NRs100 increase in real term would push the real PCI by NRs1, however, it is positive and hence supports the hypothesis that remittance income has positive role in the real PCI.

The model has high degree of explanation relating to the dependent variable as its  $R^2$  is 0.967. The t-statistic of the coefficients of total real export is found significant at one percent level ( $\alpha=0.01$ ) while that of the gross real capital formation is found significant at ten percent level ( $\alpha=0.10$ ). The coefficients of real remittance and total labor force are not significant within ten percent level. The F-statistic of the model is found significant at one percent level. The DW statistic is 0.74 which lies below the lower limit of the critical value and leads to suggest the presence of autocorrelation [ $d_L=0.94$ ,  $d_U=1.51$  for  $k=4$  and  $n=30$  at  $\alpha=0.01$ ] and hence it needs the remedial measures (Table 1.i).

After diagnosis of the autocorrelation, the coefficient of real remittance is found to be 0.01 which depicts that NRs 100 increase in the real value of remittance would lead the real PCI to increase by NRs1. The coefficients of gross real capital formation, real export and total labor force are 0.09, 0.12 and 0.05 respectively. These can be interpreted as above to give some economic meanings.

Though the explanatory degree of the model has decreased considerably ( $R^2=0.623$ ), but the model is now free from the presence of autocorrelation. The F-statistic is significant at one percent level confirming the goodness of fit of the model. The coefficients of the parameters are positive showing their positive impacts on the real PCI; but the t-statistic of total export only is found significant at one percent level ( $\alpha=0.01$ ) and rests are insignificant within ten percent level ( $\alpha=0.10$ ).

#### **4.2 Regression Results and Interpretation of Growth Rates of Nominal GDP, GNP and PCI**

The study has also tested the hypothesis that whether remittance income has been spent in the productive sectors in the framework of growth rates. The null hypothesis is that the present expenditure pattern is productive and hence it has been tried to prove that the present expenditure pattern is not productive which has been mentioned in the alternative hypothesis.

Once again GDP, GNP and PCI have been taken as dependent variables whereas  $R_m$ ,  $K$ ,  $L$  and  $X$  have been taken as independent variables. Since the nominal values of these variables are highly affected by the rate of inflation and may misguide the results, their growth rates have been measured in real terms. Hence the index 'r' is used to mean real while 'gr' is used to mean growth rate. For example,  $R_mgr$  stands for growth rate of real remittance income and so on.

The proposed model is as follow:

$$Yr(gr) = a + bRmrgr + cKrggr + dLgr + eXrggr + u$$

Where, Y represents the dependent variable.

The coefficient of remittance in first equation is 0.002 which depicts that if remittance grows by 100 percent, the real GDP grows by 0.2 percent only. Similarly, its coefficient in equations second and third is 0.003 which is also a low value. Though the coefficients are positive, they show marginal effect of growth of remittance on the percentage growth of real GDP, real GNP and per capita real income. It seems due to expenditure of remittance income on unproductive sectors. Mostly the remittance income has been utilized either in the purchase of ornaments, durable goods, real estate or repayment of old loans. Hence, import is encouraged as durable goods are necessarily foreign goods and materials for construction of houses are also imported. If there is some surplus remittance money left, it is used again to refinance for the foreign employment. Thus, the maximum amount that has been remitted from abroad again flows back to abroad without its effect on the production and employment generation within the nation. The remittance receiving households are also suffered from demonstration effect which has also played partial role in the rise of general price level. Though a little part of it has also been utilized in the education of children, but it is long term investment whose returns will be enjoyed in the long term.

The coefficient of growth rate of real value of export is only seen significant at one percent level in all three equations and rests of the coefficients are not found significant within 10 percent level. The positive but low value of coefficient of growth rate of real capital formation (0.055, 0.092 & 0.095 respectively) indicate that growth of real capital stock does not have considerable effect on the growth rates of real GDP, real GNP and real PCI. The ineffectiveness of the growth rate of capital formation seems to be due to the capital dependency towards foreign countries. The growth rate of the labor force is seen unimportant in all the three cases which is shown by its negative coefficients in all cases.

The value of  $R^2$  ranges from 0.410 to 0.495. This means that 41 percent to 49.5 percent of the variance of dependent variables  $GDPr$ ,  $GNPr$  and  $PCIr$  can be explained by the growth rates of real remittance income ( $Rmrgr$ ), real capital formation ( $Krggr$ ), labor force ( $Lgr$ ) and total real export ( $Xrggr$ ). The F-statistic and the DW statistic for all equations are significant at one percent level ( $\alpha=0.01$ ). Being  $d < 4-d_u$ , it can be concluded that there is absence of autocorrelation. Hence, the models can be said to be satisfactory and reliable (Table 1.j).

## 5. Conclusion

The biggest contribution of remittances has been found to the welfare and improved livelihood of the receiving households in terms of basic needs, better health and education and to a smaller extent in terms of savings. Though these are useful goods and safe investment, but in macro-economic terms, non-productive assets with no lasting impact on country's real income. Hence it is essential to understand that only meaningful utilization of remittance money can pave the way to the better prospects of the nation. Mere collection of remittances in banks and financial institutions does not bring desired outcome in the economy.

Such funds should be kept in proper channels in different layers of the economy to meet twin goals: poverty alleviation and sustainable development of Nepal. The real GDP of the nation could be magnified in the long run with the better use of remittance.

**REFERENCES**

Gujarati, D.N. (2004) *Basic Econometrics*, 4<sup>th</sup> edition, New Delhi: Tata McGraw-Hill.  
 MOF (1999) *Economic Survey, FY 1998/99*. Kathmandu, HMG/N.  
 \_\_\_\_\_ (2001) *Economic Survey, FY 2000/01*. Kathmandu, HMG/N.  
 \_\_\_\_\_ (2006) *Economic Survey, FY 2005/06*. Kathmandu, G/N.  
 Sigdel, Bamdev (2005) *An Overview on Remittance Economy of Nepal* in **Nepal Rastra Bank Samachar-2062**, edited. Kathmandu: NRB, pp. 26-30.  
 WB (2003). *Selected World Development Indicators in World Development Report 2003*, Washington DC: World Bank, pp. 244-250.

**Acronyms**

- CPIN      Consumer's Price Index Number
- DW        Durbin Watson statistic
- FA        Foreign Aid
- FET       Foreign Exchange earned through Tourism
- FY        Fiscal Year
- G/N       Government of Nepal
- GDP       Gross Domestic Product
- GNP       Gross National Product
- HMG/N   His Majesty's Government of Nepal
- K         Gross Capital formation
- L         Economically active Labor force
- MOF       Ministry of Finance
- NRB       Nepal Rastra Bank
- OLS       Ordinary Least Square Method
- PCI       Per Capita Income
- Rm        Remittance income
- SPSS      Statistics Package for Social Sciences
- WB        World Bank
- X         Total Merchandised exports

**APPENDIX**

**Table 1: List of the Regression Results Used in the Main Text**

a. Regression result of GDPc as dependent variable (basic)

Depend Variable	Constant + Coefficients	Statistic			
		R <sup>2</sup>	SEE	F	DW
GDPc	-33167.1 + 0.61Rm + 3.42K + 6671.83L + 1.24X (-1.83)*** (3.82)* (13.42)* (2.41)** (2.98)*	.998	7122.2	3729.0*	1.75



b. Regression result of GDPc as dependent variable (supportive)

GDPc	$6750.62 + 2.16Rm + 11.70FA + 6.89FET$							
	(1.27)* (10.50)* (7.90)* (3.57)*	.990	16884.5	849.82*	1.92			

c. Regression result of GDPr as dependent variable (basic)

GDPr	$-498.10 + 0.48Rmr + 1.84Kr + 1923.18L + 1.08Xr$							
	(-0.16) (2.40)* (4.29)* (3.11)* (2.56)**	.991	1075.35	726.2*	0.98			

d. Regression result of GNPC as dependent variable (basic)

GNPC	$-40336.8 + 0.72Rm + 3.51K + 7783.98L + 1.51X$							
	(-2.05)** (4.16)* (12.66)* (2.58)* (3.34)*	.998	7750	3657.9*	1.86			

e. Regression result of GNPC as dependent variable (supportive)

GNPC	$6687.94 + 2.42Rm + 12.25FA + 7.52FET$							
	(1.13) (10.62)* (7.47)* (3.5)*	.989	18696.5	804.85*	1.89			

f. Regression result of GNPr as dependent variable (basic)

GNPr	$-3414.45 + 0.55Rmr + 1.81Kr + 2448.13L + 1.21Xr$							
	(-1.06) (2.57)** (3.95)* (3.70)* (2.67)**	.992	1150.86	778.14*	.90			

After diagnosis of the autocorrelation, the result obtained is as follow:

$$GNPr = -41102.40 + 0.55Rm'r + 1.27K'r + 89145.41L' + 0.18X'r$$

$$(-14.69)* (0.85) (1.62) (22.74)* (0.19)$$

$$R^2 = 0.973 \quad SEE = 1832.90 \quad F = 218.31* \quad DW = 1.86$$

g. Regression result of PCI as dependent variable (basic)

lnPCI	$1.76 + 0.04lnRm + 0.59lnK - 0.24lnL + 0.14lnX$							
	(5.26)* (1.41) (5.77)* (-0.46) (2.48)**	.999	0.052	2738.4*	1.29			

h. Regression result of PCI as dependent variable (supportive)

Page: 64

PCI	$1025.79 + 0.06Rm + 0.58FA + 0.34FET$							
	(3.48)* (5.31)* (7.15)* (3.17)*	.984	935.49	528.02*	1.52			

i. Regression result of PCIr as dependent variable (basic)

lnPCIr	$4.59 + 0.01lnRmr + 0.23lnKr - 0.15L + 0.15lnXr$							
	(13.14)* (0.50) (2.04)** (-0.59) (4.17)*	.967	0.04	188.67*	0.74			

After diagnosis of the autocorrelation, the result obtained is as follow:

$$lnPCIr = 0.57 + 0.01lnRm'r + 0.09lnK'r + 0.05lnL' + 0.12lnX'r$$

$$(9.70)* (0.05) (1.43) (1.34) (4.23)*$$

$$R^2 = 0.623 \quad SEE = 0.03 \quad F = 10.31* \quad DW = 1.73$$

j. Regression results of growth rates of nominal GDP, GNP and PCI

GDPgr	$4.16 + 0.002Rmgr + 0.055Kgr - 0.673Lgr + 0.097Xgr$							
	(1.78)** (0.19) (0.87) (-0.71) (3.59)*	.410	3.03	4.35*	2.03			
GNPr	$3.99 + 0.003Rmgr + 0.092Kgr - 0.665Lgr + 0.11Xgr$							
	(1.72)** (0.27) (1.46) (-0.70) (4.11)*	.495	3.02	6.12*	1.86			
PClgr	$1.73 + 0.003Rmgr + 0.095Kgr - 0.696Lgr + 0.109Xgr$							
	(0.73) (0.31) (1.48) (-0.72) (4.00)*	.48	3.07	5.92*	1.83			

Figures in parentheses show t- values and the asterisks have the same meaning in each succeeding table. The single asterisk (\*) denotes significance at one percent level ( $\alpha=0.01$ ), double asterisks (\*\*) denotes significance at five percent level ( $\alpha=0.05$ ) whereas triple asterisks (\*\*\*) denotes significance at 10 percent level ( $\alpha=0.10$ ).

$R^2$  = The degree of explanation of the dependent variable.

F = F-statistic for the joint significance of all coefficients.

SEE = Standard Error of Estimates.

**Source:** Calculated on the basis of Table 2.

**Table 2: Data series used in estimation of regression models.**

*Figures in million unless otherwise stated.*

FY	GDPc	GNPc	PCIc (Rs.)	Rm	K	L	X	FA	FET	CPIN
										<i>b=1974/75</i>
1974/75	16571	16838	1312.39	204.3	2223	5.45	889.6	386.77	170.6	100.0
1975/76	17394	17671	1341.76	231.3	2443	5.65	1185.8	505.65	209.9	99.4
1976/77	17280	17599	1300.74	268.3	2580	5.85	1164.7	556.98	288.0	101.9
1977/78	19732	20023	1442.58	219.4	3294	6.05	1046.2	848.40	363.2	113.5
1978/79	22215	22605	1586.32	303.1	3263	6.26	1296.8	989.40	497.1	117.4
1979/80	23351	23845	1629.87	357.3	3681	6.46	1150.5	1340.50	636.8	128.4
1980/81	27307	27894	1857.12	484.2	4299	6.66	1608.7	1562.20	773.4	145.8
1981/82	30988	31603	2060.17	427.1	5465	6.86	1491.5	1723.20	841.5	161.3
1982/83	33761	34458	2200.38	549.7	6576	7.02	1132.0	2075.90	844.2	183.9
1983/84	39390	40015	2502.50	614.1	6907	7.19	1703.9	2547.50	561.0	195.5
1984/85	44441	47248	2895.10	690.7	9386	7.35	2740.6	2676.40	735.4	203.2
1985/86	53215	56443	3385.90	809.1	9431	7.51	3078.0	3491.50	1071.0	235.5
1986/87	61140	65067	3822.97	1292.6	11825	7.68	3011.4	3314.40	1740.5	267.1
1987/88	73170	78481	4518.19	1608.4	13414	7.84	4114.6	5078.50	1675.7	296.1
1988/89	85831	90811	5119.00	1628.6	16392	8.01	4195.3	5666.90	2735.3	320.6
1989/90	99702	105350	5817.23	1747.0	17002	8.17	5156.2	6427.10	3121.2	351.6
1990/91	116127	122517	6625.76	2128.3	22780	8.34	7387.5	5990.00	3587.6	385.8
1991/92	144933	152202	8063.25	2316.5	29277	8.50	13706.5	7800.40	5016.9	467.1
1992/93	165350	174705	9066.64	2994.3	37278	8.70	17266.5	9235.60	5966.0	508.4
1993/94	191596	203135	10327.15	3469.1	42032	8.90	19293.4	11557.20	8251.7	580.0
1994/95	209976	223992	11155.54	5063.6	48370	9.09	17639.2	11249.40	8973.2	596.8
1995/96	239388	252479	12317.85	4283.6	56081	9.29	19881.1	14289.00	9521.2	645.2
1996/97	269570	285173	13629.64	5595.0	60794	9.49	22636.5	15031.90	8523.0	697.4
1997/98	289798	306870	14367.92	6987.8	65375	9.69	27513.5	16457.20	9881.6	755.5
1998/99	330018	352917	16187.37	10314.6	65269	9.89	35676.3	16189.00	12167.8	841.3
1999/00	366251	392613	17641.56	42759.1	73324	10.09	49822.7	17523.90	12073.9	869.7
2000/01	394052	427447	18815.34	53525.2	78031	10.28	55654.1	18797.40	11717.0	891.0
2001/02	406138	441182	19056.71	55805.9	81613	10.48	46944.8	14384.80	8654.3	916.8
2002/03	437546	472869	19531.97	61530.6	87024	10.60	49930.6	15885.50	11747.7	960.6
2003/04	474919	509700	20593.94	66493.8	95124	10.80	53910.7	18912.40	18147.4	998.7
2004/05	508651	543902	21489.61	78043.4	101094	10.98	58705.7	23657.30	10464.0	1043.9

**Source:** Adapted and calculated from Economic Survey 1998/99 (pp: 1-7, 64, 99), 2000/01 (pp: 1-4, 48, 69) and 2005/06 (pp: 1-4, 18, 48).