The PIDE Research Report Series offers an up-to-date exposition of various economic, demographic, and anthropological aspects of the development process in developing countries generally and in Pakistan particularly. Its wide dissemination is aimed at providing a firm foundation for useful policy-making in addition to encouraging academic interaction.

The major areas of research addressed by the Series are macroeconomics and sectoral issues, international trade, labour market issues, demographic patterns, anthropological approaches, growth, and distribution. Manuscripts submitted for publication in the Series are reviewed by the PIDE Research Report Committee and published from time to time.

ISBN 969-461-126-1

RESEARCH REPORT NO. 187

The Contribution of Workers' Remittances to Economic Growth in Pakistan

Zafar Iqbal
Senior Economist,
IMF Resident Mission, Islamabad

and

Abdus Sattar
Staff Economist,
Pakistan Institute of Development Economics, Islamabad

Acknowledgements: We are thankful to Dr A. R. Kemal, Dr Najam us Saqib, and other experts at PIDE for their valuable comments during a seminar at the Pakistan Institute of Development Economics. We are also grateful to Mr Henri Lorie, Mr Milan Zavadjil, Mr Axel Schimmelpfennig, and Mr Harald Finger for their helpful comments and suggestions. The authors are also thankful to an anonymous expert for his/her helpful comments on an earlier version of this paper. The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF and PIDE. The authors are responsible for any errors remaining.

C O N T E N T S

List of Tables

List of Figures

List of Appendix Tables

I. INTRODUCTION

The role of workers' remittances in economic development of recipient countries is considered to be an important area of research. In particular, sound research in this area is important for policy-makers in order to formulate wise policies to channel these flows into productive investment. Remittances have become an important source of foreign exchange earnings, predominantly from developed countries to developing countries. The availability of foreign exchange through remittances has not only helped the recipient countries in achieving a reasonably high economic growth by reducing the current account deficit, it has also reduced their external borrowing as well as external debt burden. There is, however, also an alternative view that remittances may have a negative impact on output in recipient economies. It is argued that significant flows of workers' remittances reduce labour force participation and work efforts, which lowers output. For example, Chami, Fullenkamp and Jahjah (2003), using panel data of 113 countries, found negative impact of remittances on economic growth. They argued that remittances are compensatory flows and countercyclical in nature and there are also significant obstacles to transforming remittances into productive investment.

During the last three decades, Pakistan received a significant amount of workers' remittances, which are sent by millions of Pakistanis working abroad. For capital deficient countries, like Pakistan, workers' remittances are considered to be an important source of foreign exchange. These remittances have a positive impact on Pakistan's economy through improved balance of payments position and reduced dependence on external borrowing. Significant flows of remittances also helped Pakistan recover from the adverse effects of oil price shocks, reduced the unemployment problem, and improved standard of living of recipient households.

In Pakistan, numerous papers found that majority of remitted funds were spent on consumption. Nevertheless, some evidences also found that significant portion of remittances were used into productive investment. However, a number of researchers (including we) have argued that even if remittances are totally spent on consumption of imported goods and domestically produced good and services, there is still benefit to the receiving countries. In the past, little attention had been focused on the question of the effects of remittances on Pakistan's economic growth. Unfortunately, a few studies (reviewed in the next section) evaluated the effects of remittances on economic growth in a descriptive way, without using any precise analytical framework. Most of the

studies were lacking of theoretical underpinning and took a dim view of remittances on economic growth in Pakistan. Another particular aspect of current available literature is that much remittances research is based on survey data gathered at one point in time.

In this paper, an analytical framework is used to estimate the effects of workers' remittances on economic growth in Pakistan, using latest time series data for the period 1972-73 to 2002-03. *The main question to be examined here is whether workers' remittances contributed to economic growth in Pakistan.* We, however, hypothesise that since workers' remittances are used to supplement domestic investment and or consumption, it must have contributed to economic growth directly or indirectly. The paper proceeds as follows. Section II presents a review of literature on workers' remittances in Pakistan. Section III looks on developments in workers' remittances and economic growth over the past thirty years. Section IV discusses the data and presents the analytical framework. Section V discusses the empirical results. Finally, Section VI offers some conclusions.

II. REVIEW OF LITERATURE ON REMITTANCES IN PAKISTAN

In this study, we review the literature on workers' remittances in Pakistan.[1] This literature can be divided into micro and macro studies.

(a) Micro Studies

Most studies in Pakistan have concentrated on survey data and examined the uses and effects of workers' remittances mainly through a descriptive analysis. For example, Siddiqui and Kemal (2002), using 1993 HIES data, concluded that the decline in remittance inflows is a major contributor in explaining the increase in poverty in Pakistan. Arif (1999) examined remittances and investments at the households level, using 1986 ILO/ARTEP Survey of Return Migrant Households. The study found that about 68 percent of total workers' remittances were invested and saved by migrants and their families. Adams (1998), using panel data for five years from rural Pakistan, found that, contrary to common notion that remittances are primarily used for consumption, external remittances have a positive effect on the accumulation of rural assets. Alderman (1996), using five year panel data for rural Pakistan, found that remittances were invested in land and buildings. Malik and Sarwar (1993), using Household Income Expenditure Survey 1987-88, examined empirically consumption patterns of recipient households and found that contrary to the general impression wasteful use of remittances can not be

[1] A comprehensive review of literature on the causes and effects of workers' remittances in other countries is given in Elbadawi and Rocha (1992) and Chami, Fullenkamp and Jahjah (2003).

applied to Pakistan. Nishat and Bilgrami (1993) analysed the determinants of workers' remittances received from the Gulf States, using information from Overseas Pakistani Foundation through a sample of 7,061 migrants. The main determinants were found to be supporting of families, self-interest, behaviour of accumulation, education, income, level of skill, living without family, future planning for business and motivation of migrants to remit more. Burki (1991) concluded that workers' remittances have positive economic and social effects on households receiving incomes from the Middle East. Kozel and Alderman (1990) undertook a study on labour force participation and labour supply in Pakistan using data from the IFPRI/PIDE 1986 urban survey. They found a significant negative impact of remittances on male labour force participation.

Amjad (1986), using survey data from ILO/ARTEP Phase II migration 1986 study from Pakistan, analysed the uses of remittances. The study found that remittances financed significant portions of aggregate consumption and residential and other investments. The study also found that growth rates in small-scale manufacturing, construction, transport and communication and wholesale and retail trade were affected positively by the increased flows of workers' remittances. Ahmed (1986) commented on Amjad (1986) and pointed out that Pakistan's investment-GDP ratio had stagnated and productive infrastructure deteriorated despite significant inflow of remittances. He argued that remittances had not added much to GDP growth. ILO/ARTEP (1986) estimated that about 20 percent of total remittances were invested. Gilani, *et al*. (1981) found that most of the remittances in Pakistan were spent on consumption (62 percent), while 35 percent of remittances were either invested or saved by the migrant families.

(b) Macro Studies

To the best of our knowledge, the impact of remittance flows on economic growth in Pakistan has not been formally studied to date. A few academic papers addressed the economic effects of remittances but none of the studies used empirical exercise to investigate their impact on longer-term economic growth. For example, Burney (1987) investigated the impact of workers' remittances from the Middle East on Pakistan's GNP growth, balance of payments, and domestic savings, using time-series data for 1969-70 to 1985-86. The study concluded that foreign exchange made available because of the workers' remittances from the Middle East, had not only helped in reducing the current account deficit, but also reduced the external debt burden, improved debt servicing ability and decreased the need for additional foreign loans. The study mentioned that nothing, however, is known about the exact magnitude of remittances' contribution to the GNP growth. Nishat and Bilgrami (1991) used a simple Keynesian structural model to estimate the remittances multiplier for

Pakistan, taking data for the period 1959-60 to 1987-88. They found a multiplier of 2.4, which operates primarily through consumption. The study also found that remittances have positive impact on consumption, investment and imports. This study differs with our study as it analysed the impact of remittances on the level of gross national product, while ours' study analysed the effect of remittances on real GDP growth, which seems to be an important indicator of the economic development. There is, virtually, no macroeconomic study about the impact of remittances on longer-term economic growth. This paper fills this gap and focuses on the macroeconomic effect of remittance flows on economic growth in Pakistan. Main findings of all the studies cited above are also summarised in Appendix Table 1.

III. DEVELOPMENT IN WORKERS' REMITTANCES AND ECONOMIC GROWTH

Before proceeding to empirical investigation, it may be useful to provide a cursory look of development in workers' remittances and economic growth overtime. Table 1 presents some general trends in workers' remittances and economic growth during 1972-73 to 2002-03. Data are divided into four decades 1970s, 1980s, 1990s, and 1999-00 to 2002-03. Table 1 shows that positive growth rates in real GDP were recorded during all the four decades. The incidence of growth, however, varied markedly and remained unsustainable during the whole period. Pakistan experienced annual average growth rates in real GDP of 5.2 percent in the 1970s, 6.4 percent in the 1980s, and 4.5 percent in the 1990s. More recently, growth rates in real GDP increased from 2.2 percent in 2000-01 to 3.4 percent in 2001-02 and 5.1 percent in 2002-03.

The striking element reported in Table 1 is the rapid increase in workers' remittances overtime. Since the mid-1970s, Pakistan has been one of the major labour exporting countries to the Middle East. These workers sent a significant amount of their earnings to Pakistan. Table 1 shows that in the 1970s, annual average official remittances were equivalent to 3.9 percent of GDP and about 34 percent of total exports of goods and non-factor services (XGNFS). During the 1980s, official remittances increased significantly to 8.2 percent of GDP and about 61 percent of XGNFS. The obvious reason of an increase in workers' remittances seems to be a fast rising numbers of workers going abroad as Table 1 indicates that average annual flow of emigrant workers increased from 79 thousand during the 1970s to 107 thousand during the 1980s. Trend in remittances, however, reversed during the 1990s. The annual average remittances declined tremendously to 3.3 percent of GDP and 18.2 percent of XGNFS in the 1990s. The decline in oil prices, slowing down in economic

Table 1

Development in Economic Growth and Workers' Remittances

	1970s	1980s	1990s	1999-00	2000-01	2001-02	2002-03
Real GDP Growth (%, average per annum)	***5.2***	***6.4***	***4.5***	***3.9***	***2.2***	***3.4***	***5.1***
Workers' Remittances (million US$, average per annum)	565	2,294	1,555	984	1,087	2,389	4,237
Workers' Remittances (% of GDP, average per annum)	***3.9***	***8.2***	***3.3***	***1.7***	***2.0***	***4.3***	***6.7***
Workers' Remittances (% of XGNFS, average per annum)	34.2	60.5	18.2	9.9	10.3	21.6	30.1
Country-wise Workers' Remittances (million US$, average per annum)1/							
United States	29	129	151	80	135	779	1,238
	(5.2)	(5.6)	(9.7)	(8.1)	(12.4)	(32.6)	(29.2)
United Kingdom	72	171	120	73	81	152	274
	(12.7)	(7.5)	(7.7)	(7.4)	(7.5)	(6.4)	(6.5)
United Arab Emirates	88	266	149	148	190	469	838
	(15.6)	(11.6)	(9.6)	(15.0)	(17.5)	(19.7)	(19.8)
Saudi Arabia	186	1,079	580	310	304	376	581
	(32.8)	(47.1)	(37.3)	(31.5)	(28.0)	(15.8)	(13.7)
Kuwait	28	185	64	135	123	90	221
	(5.0)	(8.1)	(4.1)	(13.7)	(11.4)	(3.8)	(5.2)
Others	163	463	492	238	253	523	1,086
	(28.8)	(20.2)	(31.6)	(24.2)	(23.2)	(21.9)	(25.6)
Memo Items:							
Flow of Migrant Workers (000 in numbers per annum) 2/	79	107	109	108	128	147	214
Reference Years	(1973–79)	(1980–89)	(1997–99)	(1999-00)	(2000-01)	(2001-02)	(2002-03)
Stock of Overseas Pakistanis (million numbers) 3/	0.5	1.84	–	–	3.8	–	–
Reference Years	(1979)	(1985)			(2001)		

Sources: Pakistan Economic Survey (Various Issues).

1/ Figures in parenthesis are percentage shares of total average annual inflow of workers' remittances.

2/ Data for 1973 to 1989 are taken from Stahl and Azam (1990) and for 1997 to 2003 from Bureau of Emigration and Overseas Employment, Islamabad.

3/ Data for 1979 are taken from Ministry of Labour and Manpower, Bureau of Emigration and Overseas Employment (1980), for 1985 from Manpower and Overseas Pakistanis Division (1987), and for 2001 from Ministry of Labour, Manpower and Overseas Pakistanis (2001)

activities in the major labour importing countries, in particular in the Middle East, together with increased competition with other labour exporting countries, and freezing of foreign currency accounts led to a decline in workers' remittances during the 1990s. More recently, official remittances again picked up and reached the level of 6.7 percent of GDP and about 30 percent of XGNFS in 2002-03, to the record level of $4.2 billion. The main contributing factors are the September 11 event, global investigation of undocumented flows and crackdown on hundi/hawala system in the Middle East, declining spread between interbank and kerb market exchange rates (4.5 percent spread in August 2001 to almost nil in June 2003), and speedy and secured delivery of remittances to recipients.[2] It is also possible that growth in remittances, in particular in the last two years, was due to diversion of previously unrecorded flows to recorded flows.

With regard to country-wise shares, Table 1 shows that remittances from the United States remained around 5 percent during the 1970s and 1980s but later increased to 9.7 percent in the 1990s. Recently, with $1,238 million and 29.2 percent share in total remittances in 2002-03, the USA emerged as the single largest source of official remittances. The annual average share of the United Kingdom in total remittances declined continuously from 12.7 percent in the 1970s to 6.5 percent in 2002-03. Similarly, remittances from Saudi Arabia declined from the peak level of about 47 percent ($1,079 million annual average) in the 1980s to 13.7 percent ($581 million) in 2002-03. Remittances from United Arab Emirates increased from 15.6 percent in the 1970s to about 20 percent in 2002-03. Remittances from Kuwait in 2002-03 (some pick-ups during the period) reached the same level of 5 percent during the 1970s. The country-wise inflows of workers' remittances for the period 1972-73 to 2002-03 are given in Appendix Tables 2a and 2b.

Table 1 also provides some linkages between workers' remittances and economic growth. It shows that as the annual average workers' remittances rose sharply in the 1980s (from 3.9 percent of GDP in the 1970s to 8.2 percent of GDP in the 1980s), the average annual growth in GDP also increased significantly from 5.2 percent in the 1970s to 6.4 percent in the 1980s. During the 1990s, workers' remittances declined tremendously to 3.3 percent of GDP, while a significant decline in annual average real GDP growth (from 5.2 percent to 4.5 percent) was observed during the same decade. It is noteworthy that during the 1990s growth rates in all the major sectors like agriculture, manufacturing, and services declined significantly compared to the growth rates in 1980s, reflecting great fluctuations in GDP growth throughout the decade. More recent data also showed similar trends except in 2000-01. Table 1 shows

[2]With regard to speedy and secured delivery of remittances, all the major Pakistani commercial banks have established a full-fledged home remittances cell at their head offices in order to collaborate and speed up the clearing among their branches.

that official remittances increased to 4.3 percent of GDP in 2001-02 and 6.7 percent of GDP in 2002-03, which seems contributed to a higher GDP growth during the same years (3.4 percent in 2001-02 and 5.1 percent in 2002-03). Figures 1 and 2 show relationship between workers' remittances and GDP growth for the whole period under analysis. The overtime trends depicted in Figures 1 and 2 show a more clear relationship between the real GDP growth and workers' remittances during 1972-73 to 2002-03.

Fig. 1. Real GDP Growth (in percentage) and Workers' Remittances (in billion US$).

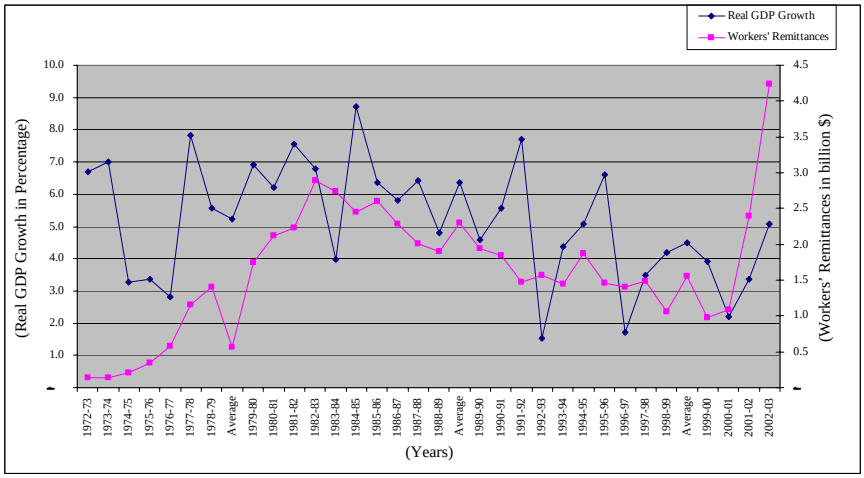

Fig. 2. Real GDP Growth (in percentage) and Workers' Remittances (in percentage of GDP).

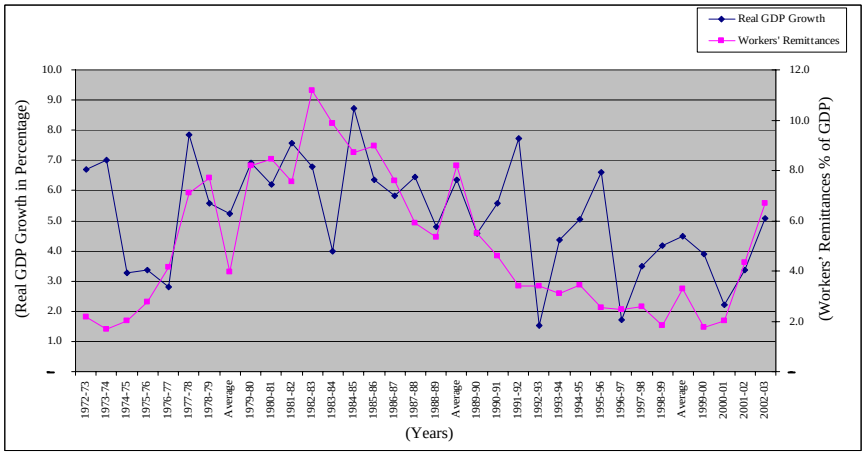

Table 1 also gives some information on the average annual flow and stock of Pakistani workers abroad, but these numbers need to be taken cautiously due to certain shortcomings with the data. For example, there is incomplete information on the number of emigrant workers as a significant proportion of workers go through unofficial channels. The reliable information on the stock of workers abroad is unavailable not only due to unofficial emigration but also because information on return migration is not available. According to Stahl and Azam (1990), the extent of illegal emigration from Pakistan to the Middle East is at least 50 percent. Table 1 shows that annual average total placement abroad during the 1970s was 79 thousand, which increased significantly to 107 thousand during the 1980s. On average, above 95 percent of total emigrant workers went to the Middle East over the period 1970s and the 1980s. It is worthwhile to note that by the late 1970s, other Asian countries like Bangladesh, India, Sri Lanka, Indonesia, Thailand and Philippines began to compete with Pakistani workers in the Middle Eastern labour market. As a result, the annual flow of Pakistani workers declined from its peak level of 168 thousand in 1981 to 63 thousand in 1986. Further, the collapse of world oil prices after 1983 and the completion of major infrastructural projects also reduced the demand for Pakistani workers in the Middle East. During the early 1990s, the Gulf crisis (i.e. invasion of Kuwait by Iraq) also affected export of Pakistani workers to the Middle East. According to an estimate, more than 100 thousand Pakistanis returned from Kuwait due to the Gulf crisis. In the late 1990s, the Gulf situation, however, improved and Pakistani workers at an average of 109 thousand per annum went abroad. More recently, the number of Pakistani workers increased from 108 thousand in 1999-00 to 214 thousand in 2002-03. It is worth noting that even after 30 years, the share of migrant workers to the Middle East remained above 95 percent of total Pakistani workers abroad.

During the 1970s and 1980s, there have also been a few attempts to estimate the stock of Pakistani workers abroad.[3] We, however, used the official statistics, for example, Ministry of Labour and Manpower (1980) estimated 0.5 million in reference year 1979. Later Pakistan, Manpower and Overseas Pakistanis Division (1985) estimated 1.8 million in 1985. More recently, Ministry of Labour, Manpower and Overseas Pakistanis (2001) estimated 3.8 million migrant workers in 2001, as reported in Table 1.

IV. METHODOLOGY AND DATA

[3]Abbasi and Javed (1980) estimated 1 million in 1977-78, Zar (1978) 1.5 million in 1978, Gilani, *et al.* (1981) 1.1 million and 1.8 million in 1979, Pakistan Census Organisation (1981) 1.7 million in 1981, ILO/ARTEP (1984) 2.5 million in 1982, Pakistan, Manpower and Overseas Pakistanis Division (1983, 1985) 1.9 million in 1982 and 1.8 million in 1985.

This section presents a simple growth model that attempts to capture the impact of workers' remittances on real GDP growth in Pakistan. In addition to remittances, we also used other explanatory variables like private investment (including private foreign direct investment), public investment, inflation rate, external debt, terms of trade, per capita income, and squared per capita income in the analysis. A behavioural function of real GDP growth ($GDPR_g$), representing economic growth, is specified as follows:

$$GDPR_g = \underset{(+)}{\alpha_0} + \underset{(+)}{\alpha_1(WR/GDP)} + \underset{(+)}{\alpha_2(IG/GDP)} + \underset{(+)}{\alpha_3(IP/GDP)} + \underset{(+/-)}{\alpha_4 INF} + \underset{(-)}{\alpha_5 (ED/GDP)} + \underset{(-)}{\alpha_6 CTOT} + \underset{(-)}{\alpha_7 PCI} + \underset{(+)}{\alpha_8 PCISQ} + \underset{(-/+)}{\alpha_9 GDPR_{g\,t-1}}$$

Where

$GDPR_g$ is real GDP growth
GDP is gross domestic product at current price
WR is workers' remittances
IG is public investment
IP is private investment
INF is inflation rate
ED is external debt
CTOT is change in terms of trade
PCI is per capita income
PCISQ is squared per capita income

The explanatory variables chosen in the above equation are those that appear in growth regressions of Chami, Fullenkamp and Jahjah (2003), Iqbal and Zahid (1998), Easterly (1993), Easterly and Rebelo (1993), Barro (1991), Khan and Kumar (1997) and Khan and Reinhart (1990) as well as several others common in the literature. It is worth noting that some of the explanatory variables are normalised by GDP. One of the main advantages of normalisation of the relevant variables by GDP is to eliminate certain econometric problems, particularly multicollinearity among the explanatory variables. As most of the standard tests for stationary are recommended for the large sample size of the time-series data, keeping in view the small sample size used in the study, we did not perform any test for stationary. The graphical presentation of the data, however, does not indicate any serious problem of non-stationary. Since no forecasting exercise has been undertaken, the issue of non-stationary is of little importance here.[4] The latest available data for the period 1972-73 to 2002-03 are taken for the analysis. Main data sources are *Economic Survey* (Various Issues), Finance Division and *Annual Reports* (Various Issues), State Bank of

[4]For further detail, see Gujarati (2003).

Pakistan. Theoretical justifications of the selected explanatory variables used in the above specified growth function are briefly explained as follows:

Workers' Remittances

According to the hypothesis developed in this study, higher remittances are expected to be positively associated with higher economic growth. The availability of foreign exchange through remittances did not only help Pakistan in achieving a reasonably high economic growth by reducing the current account deficit, it also reduced its external borrowing as well as external debt burden. Thus, the sustainable level of workers' remittances is expected to be an important prerequisite for accelerating the real output growth in Pakistan.

Investment Variables

Private investment including foreign direct investment (IP) and public investment (IG) are considered as the engine of a long-run sustained economic growth. The strong positive association between investment and growth performance is a well-established empirical fact in a number of recent studies, which show that the higher rate of investment (representing an increase in physical capital stock) leads to higher rate of economic growth. For example, Clements, Bhattacharya and Nguyen (2003), Khan and Kumar (1997), Easterly (1993), Easterly and Rebelo (1993), Barro (1991), and Khan and Reinhart (1990) found that increasing rate of physical capital leads to higher rate of economic growth.

Inflation Rate

There are alternative views about the impact of inflation on economic growth. One group of economists, for example, Mundell (1963) and Tobin (1965) pointed out that an increase in the rate of inflation results in a higher cost of holding money and portfolio shift from money to capital, consequently leading to higher investment and growth. An alternative view is that the rising inflation rate may have adverse impact on economic growth in developing countries, which can be explained through various transmission mechanisms. In developing countries, like Pakistan, inflation can raise the cost of capital. The resulting increase in the cost of capital goods leads to a reduction in the rate of investment, which in turn reduces capital accumulation and output growth. Another supporting view is that an increase in inflation rate raises the inflation tax and hence lowers the incentive to work. Thus, a fall in employment leads to a reduction in economic growth. A number of studies, for example, Hadjimichael, *et al*. (1995), De Gregorio (1993), Fischer (1991), Grier and Tullock (1989), and Kormendi and Meguire (1985) found negative relationship

between inflation rate and economic growth. Inflation rate, however, may have positive or negative impact on economic growth.

Foreign Debt

External debt is expected to have a negative impact on economic growth. Increasing external debt and consequently debt service payments adversely hit the development expenditure, which in turn affects the economic growth. A number of studies, for example, Clements, Bhattacharya and Nguyen (2003), Iqbal and Zahid (1998), Borensztein (1990, 1990a), Krugman (1988), and Eaton (1987) found a negative association between external debt and economic growth.

Terms of Trade

The change in terms of trade reflects an external shock, which can play a large role in explaining variation in output growth. It is assumed that the deteriorating terms of trade has been, in part, responsible for the past poor growth performance in Pakistan.

Income Variables

Following Barro (1991), we use per capita real income and squared per capita real income as explanatory factors. It is expected that when per capita income is higher, it is harder to grow, as argued by Barro (1991). The second indirect effect of that may be assumed is that in low-income countries like Pakistan, having high population growth and higher dependency ratios, any increase in per capita real income raises consumption, thereby leaving low savings (or dissavings) and consequently lower output growth. The second income variable is squared per capita real income, which implies that instead of a linear form, the relation between growth rate in real GDP and the level of per capita real income is quadratic. The coefficient of the squared per capita real income, therefore, is expected to be positive.

V. EMPIRICAL RESULTS AND DISCUSSION

This section explains the results of an empirical investigation of workers' remittances on economic growth in Pakistan during the period 1972-73 to 2002-03. A widely used multiple regression framework is taken to separate out the effects of remittances and other key macroeconomic factors on economic growth.[5] The regression results for economic growth function are reported in

[5]One question concerning model specification arises that there may be a problem of causality in this case. Actually, most economic relationships are causal in nature, therefore, simple regression analysis as is used in this paper can not prove any theoretically causality. But there are some tests, for example, Granger (1969) to test Granger Causality is available. It should be noted that Granger's concept of causality does not imply a cause-effect relationship, but rather is based only on "predictability".

Table 2. We used two different specifications in order to check the robustness of the results. In order to check the extent of significance of workers' remittances as an explanatory variable in a growth function, first we estimate Eq. 1 without workers' remittances and the results are reported in Table 2. They show that the explanatory power of the estimated functions represented by the adjusted R^2 is low 0.57 in Eq. 1. Further, some important explanatory variables like private investment and income variables in Eq. 1 turned out to be statistically insignificant. Alternatively, we estimate the same specified equation with workers' remittances as an explanatory variable and the results are reported in Table 2 (Eq. 2). It is worth to note that the explanatory power of the estimated equation improved significantly as the adjusted R^2 increased from 0.57 to 0.69 in Eq. 2. Similarly, the specification of the estimated function also improved as the earlier insignificant explanatory variables turned out to be statistically significant with expected signs. The results reported in Eq. 2 are generally satisfactory in the sense that signs of the coefficients are mostly as expected and they are statistically significant at the usual levels of confidence. They also confirm the results of several earlier cross-section and time-series studies on economic growth in developing countries. More detailed commentary on the results of Eq. 2 is offered in the following paragraphs.

We found a positive and highly significant relationship between workers' remittances and real GDP growth, implying that higher remittances are associated with higher economic growth. The estimated coefficient 0.4 implies that an increase in remittances-GDP ratio by one percentage point leads to GDP growth by 0.4 percent per annum. These results seem to support the proposition developed earlier that remittances had positively contributed to output growth in Pakistan during 1972-73 to 2002-03. Thus, the sustainable level of workers' remittances may be an important prerequisite for accelerating the real output growth.

Table 2 also contains the results for public and private investments as ratios to gross domestic product. Both the investment variables are highly significant with positive signs. The estimated positive coefficient of public investment is 0.6, which indicates that one percentage point increase in public investment-GDP ratio increases real GDP growth by about 0.6 percent per annum. Similarly, the estimated coefficient of private investment is 0.9. This finding tends to support the notion that the higher rate of domestic investment (both private and public) leads to higher rate of economic growth in Pakistan. This finding confirms Clements, Bhattacharya and Nguyen (2003), Easterly (1993), Easterly and Rebelo (1993) and Khan and Kumar (1997).

Table 2

Economic Growth (GDPRg) and Worker's Remittances (WR/GDP)
OLS Estimates (1972-73–2002-03)

Explanatory Variables 1/	GDPRg (Eq. 1) Without (WR/GDP)	GDPRg (Eq. 2) With (WR/GDP)
Constant	0.264	0.276***
	(1.57)	(1.93)
WR/GDP	-	**0.445***
		(2.88)
IG/GDP	0.842**	0.641**
	(2.63)	(2.27)
IP/GDP (lagged 2 years) 2/	0.328	0.889**
	(0.92)	(2.46)
INF	–0.374*	-0.245**
	(3.92)	(2.64)
ED/GDP	–0.366*	-0.242**
	(3.89)	(2.66)
CTOT	–0.064**	-0.069*
	(2.20)	(2.79)
PCI	–6.440E-05	-0.0001***
	(0.88)	(1.77)
PCISQ	8.398E-09	1.312E-08***
	(0.98)	(1.76)
GDPRg (lagged one year)	–0.498*	-0.493*
	(2.73)	(3.18)
R^2	0.70	0.79
R^2 (adjusted)	0.57	0.69
F. stat.	5.47	7.64
D. h. stat.	–0.92	-1.46

Note: Value of *t* statistics in paranthesis; * significant at 1 percent, ** significant at 5 percent, and *** significant at 10 percent.

1/ We also tried some other explanatory variables (used in the literature) such as budget deficit, employed labour force, and literacy rate in the above equations but they all remained insignificant.

2/ The private investment seems to take a gestation period of two years to produce its impact on economic growth.

The estimated coefficient of inflation rate is found negative and significant in Equation 2, which follows Hadjimichael, *et al.* (1995), De Gregorio (1993), Fischer (1991), Grier and Tullock (1989), and Kormendi and Meguire (1985). As presumed, deleterious impact of debt burden is found on output growth. The estimated coefficient of external debt as a ratio to gross domestic product (ED/GDP) shows a negative impact on economic growth, which implies that one percentage point increase in external debt-GDP ratio reduces the real GDP growth by about 0.2 percent per year. An important reason seems to be that during the last three decades increasing external debt and debt service payments adversely hit the development expenditures, which in turn affected economic growth in Pakistan. These results follow Clements, Bhattacharya and Nguyen (2003), Iqbal and Zahid (1998), Borensztein (1990a and 1990b), Krugman (1988), and Eaton (1987).

As expected, the negative and significant coefficient of changes in terms of trade has been, in part, responsible for the poor growth performance in Pakistan. The results reported in Table 2 show that the estimated coefficient of per capita real income in regression Equation (2) is negative and significant as *a priori* expectation. The negative sign on PCI seems to be fairly plausible because it suggests that when per capita income is higher, it is harder to grow. As per capita real income is in Pakistani rupees, its estimated coefficient –0.0001 implies that an increase in per capita real income by Rs. 1000 lowers the output growth by 0.1 percent per year. The second income variable is squared per capita real income, which implies that instead of a linear form, the relation between growth rate in real GDP and the level of per capita real income is now quadratic. The estimated coefficient of the squared per capita real income is positive and statistically significant, implying that the force toward convergence (negative relation between growth and level) attenuates as per capita real income rises. This finding follows Iqbal and Zahid (1998), Easterly (1993), Easterly and Rebelo (1993), and Barro (1991). Finally, the coefficient of lagged GDP growth (lagged dependent variable as an explanatory variable) turned out to be statistically significant with a negative sign, implying that the current output growth in Pakistan does not seem to relate to previous year growth.

(a) Absolute and Relative Contributions of Variables to Real GDP Growth

Since various explanatory variables in regressions behaved rather differently during 1972-73 to 2002-03, it may be useful to calculate relative and absolute contributions of each explanatory variable to real GDP growth. Using Eq. 2 in Table 2, relative and absolute contributions of key variables to real GDP growth are calculated. Following Hicks (1979) and Hadjimichael, *et al.*

(1995), the absolute contribution is calculated as the estimated coefficient multiplied by the standard deviation of the respective explanatory variable. The relative contribution of each explanatory variable is calculated dividing the estimates of absolute contribution to growth by the standard deviation of the dependent variable. It is noted that the relative contributions of each explanatory variable have become unit free.

The results reported in column (4) of Table 3 show the absolute contribution of each explanatory variable to growth rate in real GDP. The results of column (4) show that of the four explanatory variables, which have significantly positive impact on output growth, public investment has the largest positive absolute impact (1.5) followed by private investment (1.4), workers' remittances (1.2) and squared per capita income (0.1). On the other hand, the other four explanatory variables, which have negative impact on GDP growth, the external debt variable has the largest absolute effect (–1.1), followed by inflation rate (–0.8), changes in terms of trade (–0.6) and per capita income (–0.1).

Turning to relative contributions, it is worth to note that the sequence of the impact of explanatory variables in absolute and relative terms remains unchanged in all the cases. Column (5) of Table 3 shows the relative impact of eight explanatory variables, which have statistically significant effects on real GDP growth. Out of which four explanatory variables namely workers' remittance, public investment, private investment and squared per capita income have positive impact on output growth. Public investment appears to have the largest relative positive impact on output (0.8) followed by private investment (0.7), workers' remittances (0.6), and squared per capita income (0.04). Alternatively, other four explanatory factors, which have a significantly negative impact on GDP growth, are inflation rate, external debt, changes in terms of trade and per capita income. The estimates of column (5) show that external indebtedness has the largest negative impact on GDP growth (–0.6), followed by inflation rate (–0.4), changes in terms of trade (–0.3), and per capita income (–0.04). In sum, one of the key findings of this study is that among the explanatory variables taken in the analysis, workers' remittances prove to be the third main contributor to economic growth.

VI. CONCLUSIONS

In this study, we attempt to provide an analytical answer to an important economic issue whether workers' remittances contributed to economic growth in Pakistan. The latest time series data for the period 1972-73 to 2002-03 are used for the analysis. Multiple regression framework is used to separate out the effects of workers' remittances and some other key macroeconomic factors on real GDP growth. The empirical results drawn from the analysis are

representative of ongoing research on the determinants of output growth. As it

Table 3

Absolute and Relative Contributions of Explanatory Variables to Economic Growth (GDPRg)

Explanatory Variables	Estimated Standard Deviation of Explanatory Variables (in percent)	Estimated Coefficients	Absolute Contribution to Economic Growth	Relative Contribution to Economic Growth
(1)	(2)	(3)	(4)=(2)*(3)	(5)=(4)/1.907 1/
WR/GDP	***2.74***	***0.445***	***1.22***	***0.64***
IG/GDP	2.37	0.641	1.52	0.80
IP/GDP	1.55	0.889	1.38	0.72
INF	3.29	–0.245	–0.81	–0.42
ED/GDP	4.45	–0.242	–1.08	–0.56
CTOT	8.83	–0.069	–0.61	–0.32
PCI	722.03	–0.0001	–0.08	–0.04
PCISQ	6060855.7	1.312E-08	0.08	0.04

Notes: 1/ Estimated standard deviation of the dependent variable is 1.907.

is always difficult to draw precise conclusions from the regression analysis, nevertheless, the findings drawn from this study should be treated as suggestive and obviously much more remains to be done in this area. The results reported in this Research Report have led us to the following major conclusions.

The quantitative evidence shows that real GDP growth is positively related to workers' remittances during 1972-73 to 2002-03. Workers' remittances appeared to be the third important source of capital for economic growth in Pakistan. This finding suggests that right policies can channel remittance flows into more productive investment activities in the future. In the absence of workers' remittances, it was likely that exchange rate, monetary and fiscal policies could have come under great pressures. More wise policies need to be formulated to encourage the remitters about the potential benefits of remittances. As a policy matter, the government should provide attractive investment opportunities to attract more remittance flows. The government also needs to explore new markets for manpower exports in order to get sustainable level of remittances. The formulation of appropriate policy is, however, hampered due to incomplete information of number of workers abroad and total remittances sent to the economy. Policies need to be devised to bring most

remittances through formal banking channels. Recently, the establishment of Foreign Exchange Companies is a right step in this regard. More efforts need to be made to send workers through legal recruitment procedures, which will also help to maintain an accurate record of number of workers going abroad. Similarly, other sources of capital like public and private investment contributed positively to output growth. Thus, the government needs to ensure the provision of adequate physical capital (including appropriate infrastructure) with effective private sector participation in order to long-term sustain economic growth. The medium-term framework given in the final Poverty Reduction Strategy Paper (2003) is a right step in this regard.

In the regression results, there are a few factors, which adversely affected country's economic growth during 1972-73 to 2002-03. For example, inflation rate is negatively related to output growth as it raises the cost of capital and raw materials for production. Therefore, containing the inflation rate through effective monetary and fiscal policies would help to enhance real GDP growth. Similarly, the external debt is also negatively related to economic growth, suggesting that relying on domestic resources is a best alternative to finance growth. Finally, the deterioration in terms of trade affected output growth, reflecting an adverse external shock to the economy. The framework can be further developed (like computable general equilibrium model) to see how the workers' remittances contributed to output growth and in their absence, how it would have affected growth and in turn poverty in Pakistan. These questions, however, are left to future research.

Appendix Table 1

Literature on Workers' Remittances in Pakistan

Authors	Data Sources	Key Findings
Siddiqui and Kemal (2002)	HIES 1993 Data	The study concluded that the decline in remittance inflows is a major contributor in explaining the increase in poverty in Pakistan.
Arif (1999)	ILO Survey 1986	He found that about 68 percent of total workers' remittances were invested and saved by migrants and their families.
Adams (1998)	Panel Data for Five Years from Rural Pakistan	The study found that workers' remittances have a positive effect on the accumulation of rural assets.
Alderman (1996)	Panel Data for Five Years from Rural Pakistan	He found that remittances were invested in land and buildings.
Malik and Sarwar (1993)	Households Income Expenditure Survey 1987-88	The study found that wasteful use of remittances can not be applied to Pakistan.
Nishat and Bilgrami (1993)	Overseas Pakistani Foundation (a sample of 7,061 migrants)	The main determinants of workers' remittances were found to be supporting of families, self-interest, behaviour of accumulation, education, income, level of skill, living without family, future planning for business and motivation of migrants to remit more.
Burki (1991)	Descriptive	It concluded that workers' remittances have positive economic and social effects on households receiving incomes from the Middle East.
Kozel and Alderman (1990)	IFPRI/PIDE Urban Survey, 1986	They found a significant negative impact of remittances on male labour force participation.

Continued—

Appendix Table 1—(*Continued*)

Amjad (1986)	ILO/ARTEP Phase II Migration Survey, 1986 and Time Series Data 1960-61 to 1985-86	The study found that remittances financed significant proportions of aggregate consumption and residential and other investments.
Ahmed (1986)	Descriptive	He pointed out that Pakistan's investment-GDP ratio had stagnated and productive infrastructure deteriorated despite significant inflow of remittances.
ILO/ARTEP (1986)	ILO/ARTEP Phase II Migration Survey, 1986	It estimated that about 20 percent of total remittances were invested.
Gilani, *et al.* (1981)	Migration Households Survey 1979	They found that most of the remittances in Pakistan were spent on consumption (62 percent), while 35 percent of remittances were either invested or saved by the migrant families.
Nishat and Bilgrami (1991)	Time-series Data for 1959-60 to 1987-88	Using a simple Keynesian structural model, they found a multiplier of 2.4, which operates primarily through consumption. The study also found that remittances have positive impact on consumption, investment and imports.
Burney (1987)	Time-series Data for 1969-70 to 1985-86	The study concluded that workers' remittances had not only helped in reducing the current account deficit, but also reduced the external debt burden, improved debt servicing ability and decreased the need for additional foreign loans.

Appendix Table 2a

Workers' Remittances in Pakistan (1972-73 to 2002-03)

(US$ Million)

Years	Total	USA	UK	UAE	Saudi Arabia	Kuwait	Others
1972-73	136	10	72	–	8	7	39
1973-74	139	14	55	–	11	7	52
1974-75	211	19	74	22	17	10	68
1975-76	339	26	54	62	46	17	133
1976-77	578	29	49	118	159	27	195
1977-78	1,156	52	77	208	464	54	302
1978-79	1,398	54	119	206	594	75	350
Average	**565**	**29**	**72**	**88**	**186**	**28**	**163**
1979-80	1,744	61	150	217	795	112	409
1980-81	2,116	71	185	265	984	133	477
1981-82	2,225	72	121	225	1,129	152	525
1982-83	2,886	134	162	345	1,442	211	593
1983-84	2,737	106	142	309	1,441	239	500
1984-85	2,446	105	136	302	1,245	205	452
1985-86	2,595	194	223	311	1,163	225	478
1986-87	2,279	192	205	278	946	208	450
1987-88	2,013	178	215	216	828	194	381
1988-89	1,897	175	171	191	820	172	368
Average	**2,294**	**129**	**171**	**266**	**1,079**	**185**	**463**
1989-90	1,942	209	178	181	792	167	414
1990-91	1,848	190	180	172	829	15	462
1991-92	1,467	150	137	105	665	44	365
1992-93	1,562	158	114	98	748	60	384
1993-94	1,446	122	101	99	494	48	581
1994-95	1,866	141	110	178	554	58	825
1995-96	1,461	142	110	162	503	45	499
1996-97	1,409	146	98	164	418	38	544
1997-98	1,490	166	99	208	475	52	489
1998-99	1,060	82	74	125	318	106	355
Average	**1,555**	**151**	**120**	**149**	**580**	**64**	**492**
1999-00	984	80	73	148	310	135	238
2000-01	1,087	135	81	190	304	123	253
2001-02	2,389	779	152	469	376	90	523
2002-03	4,237	1,238	274	838	581	221	1,086
Average	**2,174**	**558**	**145**	**411**	**393**	**142**	**525**

Source: Economic Survey (Various Issues).

Annual Report (Various Issues). State Bank of Pakistan, Karachi.

Appendix Table 2b

Workers' Remittances in Pakistan (1972-73 to 2002-03)
(Percentage Shares in Total Workers' Remittances)

Years	Total	USA	UK	UAE	Saudi Arabia	Kuwait	Others
1972-73	100.0	7.3	53.0	–	5.8	5.2	28.7
1973-74	100.0	10.4	39.8	–	7.6	5.0	37.3
1974-75	100.0	9.1	35.1	10.6	8.2	4.9	32.2
1975-76	100.0	7.6	16.0	18.4	13.7	5.1	39.2
1976-77	100.0	5.1	8.5	20.4	27.5	4.7	33.8
1977-78	100.0	4.5	6.6	18.0	40.1	4.7	26.1
1978-79	100.0	3.8	8.5	14.7	42.5	5.4	25.0
Average	**100.0**	**5.2**	**12.7**	**15.6**	**32.8**	**5.0**	**28.8**
1979-80	100.0	3.5	8.6	12.4	45.6	6.4	23.5
1980-81	100.0	3.3	8.7	12.5	46.5	6.3	22.6
1981-82	100.0	3.2	5.5	10.1	50.8	6.8	23.6
1982-83	100.0	4.6	5.6	11.9	50.0	7.3	20.5
1983-84	100.0	3.9	5.2	11.3	52.6	8.7	18.3
1984-85	100.0	4.3	5.6	12.3	50.9	8.4	18.5
1985-86	100.0	7.5	8.6	12.0	44.8	8.7	18.4
1986-87	100.0	8.4	9.0	12.2	41.5	9.1	19.7
1987-88	100.0	8.9	10.7	10.7	41.1	9.6	18.9
1988-89	100.0	9.2	9.0	10.1	43.2	9.1	19.4
Average	**100.0**	**5.6**	**7.5**	**11.6**	**47.1**	**8.1**	**20.2**
1989-90	100.0	10.8	9.2	9.3	40.8	8.6	21.3
1990-91	100.0	10.3	9.7	9.3	44.9	0.8	25.0
1991-92	100.0	10.2	9.3	7.2	45.3	3.0	24.9
1992-93	100.0	10.1	7.3	6.3	47.9	3.9	24.6
1993-94	100.0	8.5	7.0	6.9	34.1	3.3	40.2
1994-95	100.0	7.6	5.9	9.6	29.7	3.1	44.2
1995-96	100.0	9.7	7.5	11.1	34.4	3.1	34.1
1996-97	100.0	10.4	6.9	11.7	29.7	2.7	38.6
1997-98	100.0	11.2	6.6	13.9	31.9	3.5	32.9
1998-99	100.0	7.7	6.9	11.8	30.0	10.0	33.5
Average	**100.0**	**9.7**	**7.7**	**9.6**	**37.3**	**4.1**	**31.6**
1999-2000	100.0	8.1	7.4	15.0	31.5	13.7	24.2
2000-2001	100.0	12.4	7.5	17.5	28.0	11.4	23.2
2001-2002	100.0	32.6	6.4	19.7	15.8	3.8	21.9
2002-2003	100.0	29.2	6.5	19.8	13.7	5.2	25.6
Average	**100.0**	**25.7**	**6.7**	**18.9**	**18.1**	**6.5**	**24.1**

Sources: Based on Appendix Table 1a.

REFERENCES

Abbasi, R., and T. Javed (1980) Estimation of Volume of Emigration from Air Traffic Data. International Migration Project. Islamabad: Pakistan Institute of Development Economics. (Monograph No. 1.)

Adams, Richard H. (1998) Remittances, Investment, and Rural Assets Accumulation in Pakistan. *Economic Development and Cultural Change* 47, 155–173.

Ahmed, Meekal A. (1986) Comments on Impact of Workers' Remittances from the Middle East on Pakistan's Economy: Some Selected Issues. *The Pakistan Development Review* 25:4, 783–785.

Alderman, Harold (1996) Saving and Economic Shocks in Rural Pakistan. *Journal of Development Economics* 51, 343–365.

Amjad, Rashid (1986) Impact of Workers' Remittances from the Middle East on Pakistan's Economy: Some Selected Issues. *The Pakistan Development Review* 25:4, 757–782.

Arif, Ghulam M. (1999) Remittances and Investments at the Household Level in Pakistan. (PIDE Research Report No. 166.)

Barro, Robert. J. (1991) Economic Growth in a Cross Section of Countries. *Quarterly Journal of Economics* 106, 407–443.

Borensztein, Eduardo (1990) Debt Overhang, Credit Rationing, and Investment. *Journal of Development Economics* 32, 315–335.

Borensztein, Eduardo (1990a) Debt Overhang, Debt Reduction, and Investment: The Case of Philippines. *IMF Working Paper* 90/77.

Bureau of Emigration and Overseas Employment (Unpublished).

Burki, Shahid. J. (1991) Migration from Pakistan to the Middle East. In D. G. Papademetriou and P. L. Martin (ed.) *The Unsettled Relationship: Labour Migration and Economic Development.* London: Greenwood Press.

Burney, Nadeem (1987) Workers' Remittances from the Middle East and Their Effect on Pakistan's Economy. *The Pakistan Development Review* 26:4, 745–763.

Chami, Fullenkamp, and Jahjah (2003) Are Immigrant Remittances Flows a Source of Capital for Development. *IMF Working Paper* (WP/03/189).

Clements, Bhattacharya, and Nguyen (2003) External Debt, Public Investment, and Growth in Low-income Countries. *IMF Working Paper* (WP/03/249).

De Gregorio, Jose (1993) Inflation, Taxation, and Long-run Growth. *Journal of Monetary Economics* 31, 271–298.

Easterly, William (1993) How Much do Distortions Affect Growth? *Journal of Monetary Economics* 32, 187–212.

Easterly, William, and Sergio Rebelo (1993) Fiscal Policy and Economic Growth: An Empirical Investigation. *Journal of Monetary Economics* 32, 417–458.

Eaton, Jonathan (1987) Public Debt Guarantees and Private Capital Flight. *World Bank Economic Review* 1, 377–395.

Elbadawi, Ibrahim A., and Robert de Rezende Rocha (1992) Determinants of Expatriate Workers' Remittances in North Africa and Europe. (World Bank Policy Research Working Paper 1038.)

Fischer, Stanly (1991) Macroeconomics, Development, and Growth. *NBER Macroeconomics Annual.* 329–364.

Gilani, Ijaz, F. Khan, and M. Iqbal (1981) Labour Migration from Pakistan to the Middle East and Its Impact on the Domestic Economy. Part 1. Pakistan Institute of Development Economics, Islamabad. (Research Report Series 126.)

Granger, C. W. J. (1969) Investigation Causal Relations by Econometric Models and Cross-spectral Methods. *Econometrica* 24–36.

Grier, Kevin, and Gordon Tullock (1989) An Empirical Analysis of Cross National Economic Growth, 1951-80. *Journal of Monetary Economics* 24, 259–276.

Gujarati, N. Damodar (2003) *Basic Econometrics*. (Fourth Edition). New York: McGraw-Hill, Inc.

Hadjimichael, M. T., D. Ghura, M. Muhleisen, R. Nord, and E. M. Ucer (1995) *Sub-Saharan Africa Growth, Savings, and Investment, 1986-93.* Washington, D. C.: International Monetary Fund.

Hicks, Norman L. (1979) Growth vs. Basic Needs: Is There a Trade-Off? *World Development* 7, 985–994.

ILO/ARTEP (1984) *Impact of Return Migration on Domestic Employment in Pakistan: A Preliminary Analysis.* Bangkok.

ILO/ARTEP (1986) Preliminary Estimates of Demand for Pakistani Labour and Workers Remittances from the Selected Middle East Countries (Saudia Arabia, UAE, Kuwait, Oman and Qatar). New Delhi. (Interim Report.)

ILO/ARTEP (1987) *Impact of Out and Return Migration on Domestic Employment in Pakistan*. Vols. 1–6, India: New Dehli.

Iqbal, Zafar, and Ghulam Mustafa Zahid (1998) Macroeconomic Determinants of Economic Growth in Pakistan. *The Pakistan Development Review* 37, 125–148.

Khan, Mohsin, and Carmen Reinhart (1990) Private Investment and Economic Growth in Developing Countries. *World Development* 18, 19–27.

Khan, Mohsin, and Manmohan S. Kumar (1997) Public and Private Investment and the Growth Process in Developing Countries. *Oxford Bulletin of Economics and Statistics* 1, 69–88.

Kormendi, Roger C., and Philip G. Meguire (1985) Macroeconomic Determinants of Economic Growth: Cross Country Evidence. *Journal of Monetary Economics* 16, 141–163.

Kozel, Valerie, and Harold Alderman (1990) Factors Determining Work Participation and Labour Supply Decisions in Pakistan's Urban Areas. *The Pakistan Development Review* 29, 473–479.

Krugman, Paul (1988) Financing vs. Forgiving a Debt Overhang: Some Analytical Issues. Cambridge, Massachusetts: National Bureau of Economic Research. (NBER Working Paper No. 24869.)

Malik Sohail. J., and N. Sarwar (1993) Some Tests of Differences in Consumption Pattern: The Impact of Remittances Using Household Income Expenditure Survey of Pakistan 1987-88. *The Pakistan Development Review* 32:4, 699–711.

Mundell, R. (1963) Inflation and Real Interest. *Journal of Political Economy* 71, 280–283.

Nishat, Mohammad, and Nishat Bilgrami (1993) The Determinants of Workers' Remittances in Pakistan. *The Pakistan Development Review* 32:4, 1235–1245.

Nishat, Muhammad, and Nighat Bilgrami (1991) The Impact of Migrant Workers' Remittances on Pakistan's Economy. *Pakistan Economic and Social Review* 29, 21–41.

Pakistan, Government of (1980) *Emigration of Statistics of Pakistani Manpower*. Islamabad: Pakistan, Ministry of Labour and Manpower, Bureau of Emigration and Overseas Employment.

Pakistan, Government of (1981) *Census 1981*. Islamabad: Census Organisation.

Pakistan, Government of (1983) *A Report on Pakistanis Working or Studying in Overseas Countries.* Islamabad: Ministry of Labour, Manpower and Overseas Pakistanis, Manpower and Overseas Pakistanis Division.

Pakistan, Government of (2001) *Technical Unit Workforce Situation Report*. Islamabad: Ministry of Labour, Manpower and Overseas Pakistanis.

Pakistan, Government of (Various Issues) *Economic Survey.* Finance Division.

Siddiqui, Rizwana, and A. R. Kemal (2002) Remittances, Trade Liberalisation, and Poverty in Pakistan: The Role of Excluded Variables in Poverty Change Analysis. A PIDE Research Study under the Project of Globalisation and Poverty in South Asia.

Sofranko, A. J., and Khan Idris (1999) Use of Overseas Migrant's Remittances to the Extended Family for Business Investment: A Research Note. *Rural Sociology* 64, 464–481.

Stahl, Charles W., and Farooq-i-Azam (1990) Counting Pakistanis in the Middle East: Problems and Policy Implications. *Asian and Pacific Population Forum* 4, 1–28.

State Bank of Pakistan (Various Issues) *Annual Report.* State Bank of Pakistan, Karachi.

Tobin, J. (1965) Money and Economic Growth. *Econometrica* 33, 671–684.

Zar, Z. (1978) *External Migration of Labour from Pakistan*. Karachi: Overseas Employment Corporation, Government of Pakistan.

ABSTRACT

This study attempts to provide an analytical answer to the important economic issue of whether workers' remittances contributed to economic growth in Pakistan during the period 1972-73 to 2002-03. The quantitative evidence shows that workers' remittances appeared to be an important source of economic growth. Other sources of growth were the public and private investment. Alternatively, there are a few factors like inflation rate, external debt, and deterioration in the terms of trade that affected country's economic growth adversely.