Conference Paper No.57

MACROECONOMIC REFORMS AND RETURN TO HUMAN CAPITAL IN PAKISTAN

Muhammad Sabir[1]

*Muhammad Sabir is economist at Social Policy and Development Centre (SPDC).
Author's Note: The author is gratefully acknowledges comments and suggestions of Hafiz A. Pasha (Director Regional Bureau for Asia and Pacific UNDP), Qazi Masood Ahmed (Associate Professor, IBA), Haroon Jamal (Principal Economist, SPDC) and Zafar Moen Nasir Chief of Research at PIDE

Paper presented at the 19th Annual General Meeting and Conference of the Pakistan Society of Development Economist held during January 13 – 15, 2004 in Islamabad.

1. INTRODUCTION

Pakistan has been following an agenda for macroeconomic reforms since 1987-88. These reforms contained a broad range of macroeconomic stabilization and structural adjustment policies. These macroeconomic reforms can be classified into three broad categories: (1) *trade liberalization* include rationalization of the tariff structure, import liberalisation, exchange rate mechanism; (2) *fiscal reforms* include broadening the withholding taxes and sales tax net, rationalization of government expenditures including a reduction in subsidies, privatization of public assets; (3) *other macroeconomic reforms* include deregulation of investments and foreign exchange, financial reforms, restructuring of public utilities, etc. These reforms altogether have an adverse impact on the pace of economic growth and are a cause of higher poverty and inequality in the country [see Bengali and Ahmed (2002), Kemal (2003)]. This economic slowdown also affects the labour market conditions and resulted in an increase in unemployment rate, and a rise in nominal and a fall in real wages. There are theoretical arguments as well as empirical evidences that the slow GDP growth affects the rate of return to education, which implies that labourer of different educational background and experience may affect differently by reforms (See for example Krueger and Lindahl, 2001).

Three clear predictions emerge from considering the relationship between macroeconomic reforms, wages and the returns to human capital in developing countries. First, macroeconomic reform may have a significant impact on returns to human capital in countries, which have experienced long periods of industrial protection, high subsidies and high development expenditure. Previously protected industries will experience falling rents in the face of international competition and absence of subsidies. Hence macroeconomic reforms may lead to a decline of the relative wages of traded sector industries most affected by international competition. Whether such effects will spill- over into the non-traded sector depend on the fraction of workers affected by trade and their impact on local labour markets. Second, according to the traditional Stolper-Samuelson theorem, trade liberalization should raise the price of developing countries abundant factor (less educated labour), thus reducing the skilled wage premium and, by extension, wage inequality. Third, macroeconomic reforms change the profitability of various economic activities, which affect the investment level, and ultimately affect return to human capital. Macroeconomic reforms in developing countries

may therefore produce gainers and losers across different industrial sectors and educational groups.

Somewhat curiously, and in contradistinction to the standard theory, the extant empirical evidence on the effects of macroeconomic reform indicates that the skilled wage premium has increased rather than decreased in a number of countries following liberalization, including Mexico (Hanson and Harrison, 1999; Robertson, 2000), Chile (Beyer *et a*l, 1999), Morocco (Currie and Harrison, 1997). There are a number of possible explanations for these findings. First, macroeconomic reforms in developing countries may generate increased demand for more educated workers through a stimulus to capital inflows, which may be directly complementary with skilled labour[2]. Second, technology transfer entails high skills so that even if the transferred technology were skill-neutral, there would be a temporary increased demand for skilled labour while the new machinery and technology is being installed post-liberalization (Pissarides, 1997).

The impact of macroeconomic reforms on wages and the returns to human capital is ultimately an empirical issue, and the case of Pakistan is particularly well suited to this purpose for a number of reasons. First, one of the main features of the Pakistan's labour market is its wide wage and income distribution. The main causal factors underpinning this inequality are the unequal distribution of education together with its high rates of return (SDIP 2002-03). Second, macroeconomic reforms initiated in 1987-88 have widespread and substantial impact on the economy. Third, Pakistan benefits from the availability of a reliable series of individual-level data.

In this paper we estimate the returns to human capital in Pakistan by utilizing micro-data from "*Labour Force Survey 1990-91 and 1999-2000*. We also investigate the impact on wages and the returns to human capital of the macroeconomic reform that took place in Pakistan. The three principal questions that this paper addresses are therefore as follows:

a. What is the impact of macroeconomic reforms on wages and the returns to human capital in different sectors of the economy?

[2] In-flowing capital embodies in-flowing technology, which is assumed to be skill-biased because the new technology is mainly designed in the industrialized world, which is skill intensive, and, *a fortiori*, because there is evidence that new technology is skill-biased within the industrialized world (Berman *et a*l, 1998).

b. What are the regional implications of macroeconomic reforms on return to human capital?
c. By caring above analysis can we identify the gainers and losers as a result of macroeconomic reforms?

The remainder of the paper is organized as follows. Section 2 discusses previous estimates of the returns to education in Pakistan and charts the progress of macroeconomic reforms over the last decade. Section 3 discusses the data series and methodology. Section 4 presents analyses of these data. Finally, section 5 concludes.

2.1 Returns to Human Capital

The investigation of rates of return to education in Pakistan has received considerable attention due to the widely acknowledged close relationship between education and income. Since Haque (1977) and Hamdani (1977) reported that education positively contributed in the increase in income, many papers have emphasized the role of education in the explanation of the distribution of income in Pakistan. Standard Mincerian wage equations are used in almost all studies in Pakistan to estimates the returns to education and noted positive relation between income and education. However, the estimated returns were lower as compared to other developing countries especially in primary and secondary education [see Psacharopoulos (2002)].

The very unequal distribution of education between different groups and regions is another feature of the Pakistan's labour market. Greater inequality in educational attainment tends to increase income inequality, *ceteris paribus*. For example, having different levels of education by region, say, produces different returns to education among regions. Moreover, more recently, some increase in schooling inequality has been noted as a result of decline in public spending on education, with a resulting negative impact on income inequality (SDIP, 2002-03).

In the last two decades, there has been a steady and noticeable increase in average educational attainment of the work force in Pakistan. One expected consequence of this increase in schooling is a fall in the average return to education. However, underlying this fall, the returns to education may vary across different education levels according to changes in the distribution of education and with economic changes that affect the structure of labour

demand. Haroon *et al* (2003) find decreasing returns to education since the 1991 for all educational levels except for the college/university-educated group, which experienced a marked increase. Coupled with the increase in the supply of college/university-educated workers over the period, the interpretation of this increased return is that there has been an increase in the relative demand for more highly educated workers. This coincides with the period of macroeconomic reform.

2.2 Macroeconomic Reforms in Pakistan

Pakistan has adopted an agenda of macroeconomic reforms since 1987-88, which is basically a set of structural adjustment policies. The Structural Adjustment Programme required the slashing of the budget deficit and the current account deficit as well as a range of sectoral reforms. The liberalization of the financial sector in 1991, and the wholesale privatization of state owned industrial enterprises in 1992. These changes suggest significant allocative adjustments in the economy with potentially large effects on the wage structure[3] in different sector and provinces.

3. RETURNS TO HUMAN CAPITAL: Data and Methodology

The computation of return to human capital divided into two distinct steps: (i) Estimation of the Mincer Wage Equation which is simply the regression of the natural log of wages on education level and experience (ii) the regression results are used to compute relative wages or return to human capital.

3.1 Data

The data sets used in the estimation of return to human capital are drawn from the *Labour Force Survey (LFS) 1990-91 and 1999-2000*, collected by the Federal Bureau of Statistics (FBS). The LFS data provides detailed socio-economic information about more than 111,000 individuals. The information on labour market activities is provided for individuals of 10 years of age and above. To adjust for seasonal variations, the data collection is spread over all the years. The survey collects information on various activities of workers. The information about age, literacy, education, and earnings is particularly important for this study.

[3] The detailed discussion of reform is beyond the purview of this paper and interested readers refer to Kemal (2003) for detailed analysis related to impact reform on poverty.

A comparison of LFS with other data sources shows the superiority of LFS because of greater internal and external consistencies [Zeeuw (1996)]. Since 1990s, the questionnaire of the LFS has been revised more than ones and a number of other changes are made to improve the quality of data collection as well as coverage of different sub-groups. The first available micro data set of the *Labour Force Survey 1990-91* and the latest *Labour Force Survey 1999-2000* are used in the estimation of the return to human capital.

The aim of this study is to compute the return to human capital at two distinct points to capture the impact of macroeconomic reform; therefore, we restricted our sample to only regular wage and salaried workers of 10 to 70 years of age, including both male and female[4]. The majority of these individuals are full-time employees who work more than 35 hours per week. The data on earnings include only cash payments; other benefits such as bonuses are not included in these earnings.

Table – 1 provides summary statistics for the employed labour force used in the wage rate regression by industrial category, and by province. In 1990-91 the final sample of regular salaried workers comprised of 15,516, 8,055, 5,707 and 2,992 individuals in Punjab, Sindh, NWFP and Balochistan respectively. In 1999-2000, after revision in the sampling methodology, as compared to 1990-91, the total sample size was reduced. As a result, in 1999-2000, the final sample of regular salaried workers reduced to 14,399, 6,063, 4,707 and 2,809 individuals in Punjab, Sindh, NWFP and Balochistan respectively.

TABLE - 1
SAMPLE SIZE OF SALARIED WORKERS IN LFS 1990-91 AND 1999-2000

	Agriculture	Manufacturing	Services	Total
1990-91				
Punjab	5,864	2,364	7,288	**15,516**
Sindh	2,782	1,224	4,049	**8,055**
NWFP	2,154	463	3,090	**5,707**
Balochistan	1,317	134	1,541	**2,992**
Total	**12,117**	**4,185**	**15,968**	**32,270**
1999-2000				
Punjab	5,529	2,144	6,726	**14,399**
Sindh	2,332	781	2,950	**6,063**
NWFP	1,741	417	2,549	**4,707**
Balochistan	1,188	78	1,543	**2,809**
Total	**10,790**	**3,420**	**13,768**	**27,978**

Source: Authors Estimates Based on LFS 1990-91 & 1999-2000

[4] There is convincing evidence available on gender differentials and generally separate samples of males and females are selected for analysis. However, in Pakistan, female participation rate is very low, which may create a problem with respect to degrees of freedom in case of separate sample estimation for males and females by sector and by province.

3.2 Methodology

Mincer (1974) demonstrates that the relationship between a worker's years of schooling and earning is log-linear. Typically, this relationship, the earnings function, is written as:

$$Lnw = a + bS + \varepsilon \qquad \text{..... (1)}$$

Where lnw is the natural logarithm of earnings, S is years of schooling and ε represents random forces that affect wages. This relationship holds provided that: (1) the only cost of an additional year of schooling is foregone earnings and (2) the marginal increase in earnings due to additional year of schooling is constant during the worker's lifetime. Under these conditions, β is interpreted as the rate of return on schooling which, by definition, equals to proportional change in a worker's wages associated with one additional year of schooling.

However, this crude measure will now be complemented with a more detailed investigation by looking at returns to specific degrees. Assuming that the degree gained is more important than actual years spent at school, the linearity assumption implicit in the years of schooling specification is abandoned. Similarly, this earning function is also augmented by adding number of years of work experience and its square to avoid any upward bias in the estimation of return to education. In case of Pakistan, there is no information about actual work experience or years of work interruption available in the *Labour Force Surveys*. Therefore, we take age as a proxy for experience, rather than potential experience (age minus years of schooling minus six) in the regression analysis. Finally, ordinary least squares method is applied to the following earnings function.

$$\ln w = \beta_0 + \delta_1(age) + \delta_2(age)^2 + \sum_{i=0}^{6} \beta_i D_i + \varepsilon \text{.....(3)}$$

where D_i is the dummy variable for educational level i indicating completion of Primary, Middle, Matric, Intermediate, Graduation and Post Graduation, professional levels of education of the employed labour force respectively. The constant term β_0 represents the log earnings at educational level zero.

4. RESULTS AND DISCUSSION

4.1 Basic Descriptive

We first investigate whether the episode of macroeconomic reforms that began around 1990 had a noticeable effect on average wages. Table 2 shows that across the period, the average real annual wage was almost unchanged: it was Rs. 1,698 in 1990-91 and Rs. 1,746 in 1999-2000. However, the mean wage disguises movements in the wages of agriculture and non-agriculture sectors. The average real wages is agriculture sector declines from Rs. 1,277 in 1990-91 to Rs. 1,010 in 1999-2000. Moreover, the regional variations also emerge in the pattern, which indicates that except NWFP real annual wages in agriculture sector are fallen in all provinces. In contrast, average annual real wages in manufacturing and services sectors rose from Rs. 1,608 and Rs. 1757 in 1990-91 to Rs. 1,718 and Rs. 1,802 in 1999-2000 respectively. The regional variation also appeared in manufacturing and services sectors and except Sindh real annual wages in manufacturing and services sectors are either increases or stagnant. Sindh is the only province that experiences the decline in annual real wages in all sectors of the economy. The decrease/increase in agriculture and non-agriculture sector wage differential can easily be linked with the macroeconomic reforms. For instance, removal of development subsidy in agriculture and increase in input prices of imported goods as a result of exchange movement may be the main cause of decline in wages in agriculture sector. On the other hand, wage increase in manufacturing and services sectors perhaps be linked to the consequences of increased competition in traded sector following macroeconomic reform. As can be seen, almost all of the increase in dispersion is a result of increases in wages in the non-agriculture sectors.

TABLE - 2
REAL AVERAGE ANNUAL WAGES IN 1990-91 & 1999-2000

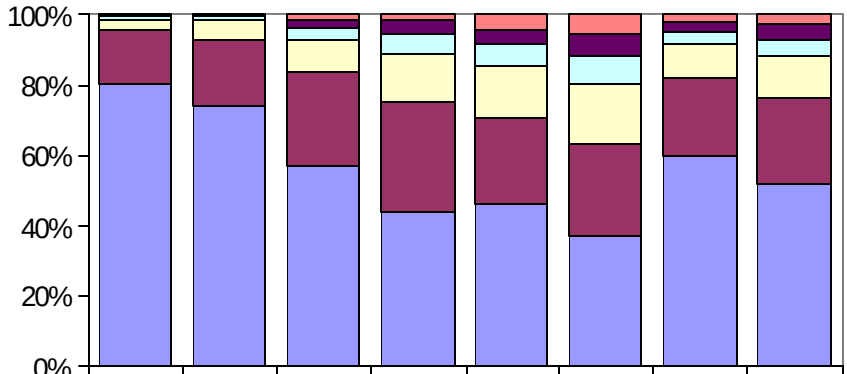
	Agriculture	Manufacturing	Services	Total
1990-91				
Punjab	1,063	1,325	1,646	1,547
Sindh	1,367	1,995	1,963	1,926
NWFP	1,234	1,386	1,643	1,592
Balochistan	1,549	1,522	1,799	1,765
Overall	**1,277**	**1,608**	**1,757**	1,698
1999-2000				
Punjab	763	1,634	1,817	1,729
Sindh	1,023	1,930	1,878	1,831
NWFP	1,353	1,504	1,671	1,647
Balochistan	1,385	1,882	1,792	1,759
Overall	**1,010**	**1,718**	**1,802**	**1,746**

Source: Authors Estimates Based on LFS 1990-91 & 1999-2000

Of course, movements in average wages in different sectors can occur for a number of reasons in addition to any impact of macroeconomic reforms. Perhaps the most pertinent

during the period under investigation are the significant increase in the average levels of education of the Pakistan's workforce. The change in education composition of employed labour force is depicted in Figure 1. It is evident that the increase in mean schooling years of employed labour force is evident from Figure 1 and is dominated by a fall in the proportion of illiterates, and an increase, in particular, in the proportion that completed secondary or some college level education. There are also significant differences in the educational composition of employment by sector. Figure 1 reveals that the non-agriculture sector is relatively skilled compared to the agriculture sector, employing a much greater share of more educated workers.

Figure 1: CHANGES IN THE EDUCATIONAL COMPOSITION OF EMPLOYED LABOUR



	1990-91	1999-00	1990-91	1999-00	1990-91	1999-00	1990-91	1999-00
	Agriculture		Manufacturing		Services		Overall	
Post Graduate/Professional	0%	0%	1%	2%	4%	5%	2%	3%
Graduate	0%	0%	2%	4%	4%	7%	3%	4%
Intermediate	1%	1%	3%	6%	6%	8%	4%	5%
Matric	3%	5%	10%	14%	15%	17%	10%	12%
Primary	15%	19%	27%	31%	24%	26%	21%	24%
Illiterate	80%	74%	57%	44%	46%	37%	60%	52%

4.2 Rate of Returns to Human Capital

To disentangle the multifarious changes in the composition of employment over time and their impact on wages separate from any impact attributable to macroeconomic reforms clearly requires a multivariate approach. Standard Mincerian earnings functions for all four provinces, in which log wages are regress on age (a proxy for experience) and its square, indicators recording the highest level of education achieved are used to estimates the return

on human capital. When estimating the *Mincerian Wage Equation* "illiterate" is taken as the reference category for education levels. Similarly, for the sectoral analysis, agriculture is selected as the reference sector. Estimation results for the respective *Mincerian Wage Equations* for 1990-91, and 1999-2000, for all four provinces, are presented in Table 3. The coefficient estimates appear sensible and the results are in line with the human capital theory; there is a hump-shaped age-earnings profile.

TABLE - 3
PROVINCE-WISE ESTIMATES OF THE MINCER WAGE EQUATIONS FOR 1990-91 & 1999-00

	Punjab		**Sindh**		**NWFP**		**Balochistan**	
	1990-91	**1999-00**	**1990-91**	**1999-00**	**1990-91**	**1999-00**	**1990-91**	**1999-00**
Constant	5.7929	6.1880	5.8922	6.4072	5.9696	5.9727	5.9008	6.8860
	0.0694	0.0694	0.1159	0.1159	0.1057	0.1057	0.3121	0.3121
Age (Agriculture)	0.0408	0.0665	0.0521	0.0528	0.0479	0.1014	0.0639	0.0485
	0.0058	0.0058	0.0074	0.0074	0.0078	0.0078	0.0181	0.0181
Age (Manufacturing)	0.0557	0.0800	0.0684	0.0793	0.0491	0.0944	0.1516	0.0740
	0.0047	0.0047	0.0071	0.0071	0.0076	0.0076	0.0444	0.0444
Age (Services)	0.0497	0.0682	0.0344	0.0662	0.0476	0.0867	0.0319	0.0555
	0.0042	0.0042	0.0051	0.0051	0.0061	0.0061	0.0070	0.0070
$(Age)^2$ (Agriculture)	-0.0004	-0.0008	-0.0005	-0.0005	-0.0006	-0.0014	-0.0007	-0.0005
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
$(Age)^2$ (Manufacturing)	-0.0006	-0.0009	-0.0008	-0.0008	-0.0005	-0.0012	-0.0022	-0.0012
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0007	0.0007
$(Age)^2$ (Services)	-0.0005	-0.0007	-0.0003	-0.0006	-0.0005	-0.0010	-0.0003	-0.0006
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Primary	0.1511	0.2071	0.0619	0.0402	0.1457	0.0683	0.1127	0.1852
	0.0319	0.0319	0.0296	0.0296	0.0500	0.0500	0.0466	0.0466
Middle	0.2890	0.2189	0.2385	0.2370	0.3262	0.0683	0.1513	0.1852
	0.0318	0.0318	0.0330	0.0330	0.0495	0.0495	0.0476	0.0476
Matric	0.4427	0.4186	0.2736	0.2716	0.4038	0.2618	0.2277	0.1925
	0.0265	0.0265	0.0288	0.0288	0.0369	0.0369	0.0338	0.0338
Intermediate	0.6505	0.5326	0.4202	0.3636	0.5037	0.3460	0.3765	0.2980
	0.0379	0.0379	0.0316	0.0316	0.0492	0.0492	0.0464	0.0464
Graduate	0.9101	0.9115	0.6711	0.5852	0.7134	0.6065	0.6792	0.5466
	0.0432	0.0432	0.0318	0.0318	0.0558	0.0558	0.0701	0.0701
Post Graduate	1.1833	1.2435	0.9128	0.6984	1.1264	0.8999	0.8539	0.7358
	0.0537	0.0537	0.0500	0.0500	0.0657	0.0657	0.0883	0.0883
Others	1.1546	1.1616	1.0412	0.7754	1.0939	1.0229	0.9410	0.9813
	0.0580	0.0580	0.0450	0.0450	0.0882	0.0882	0.0683	0.0683
Adjusted R^2	**0.3629**	**0.3919**	**0.3887**	**0.3262**	**0.3393**	**0.2886**	**0.3670**	**0.2577**

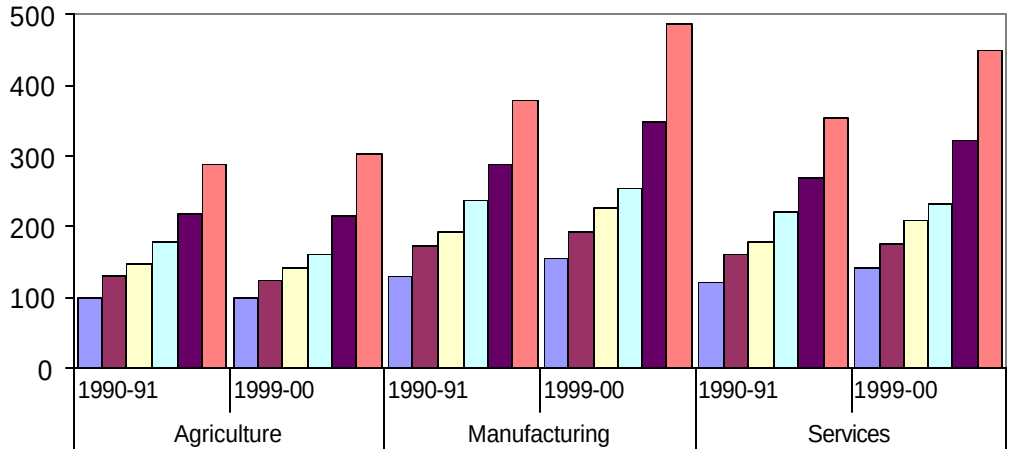
Standard errors in italics.

The coefficients of all education dummies are positive and significant, which reflects that having no schooling can put a serious strain on career advancement. Moreover, as expected,

return to higher academic degrees rises unequivocally with higher level of education in all four provinces. Comparison of province-wise estimates of returns to education level for 1990-91 and 1999-2000 portray a picture of regional disparity; disproportionate economic growth in the four provinces affected labour demand and in turn wages. For instance, in Punjab, according to the estimates, return to middle, matric and intermediate are less in 1999-2000 as compared to 1990-91, however, return to other education categories is higher. In contrast to Punjab, return on all education categories decreased during 1999-2000, as compared to 1990-91, in Sindh and NWFP. In Balochistan, return on primary, middle and professional education increased over time, while returns on the remaining categories fell during the decade of the 1990s.

From the estimates of the mincer wage equations we compute average annual earnings for each schooling group, for each province, in the three respective sectors, for 1990-91 and 1999-2000. Average annual earnings are estimated by dividing the civilian labour force, aged 10-70 years into six broad categories based on education level, starting from no schooling to postgraduate. However, nursery school and kindergarten are not counted as educational levels, therefore, an individual qualifies for the no schooling category if he attended nursery school or kindergarten, or even if he attended, but did not complete primary education. Similarly, for other levels only those workers have been included who have completed the particular level of education.

Figure 2: ESTIMATED SECTOR-WISE RETURNS TO EDUCATION: PUNJAB 1991 & 2000

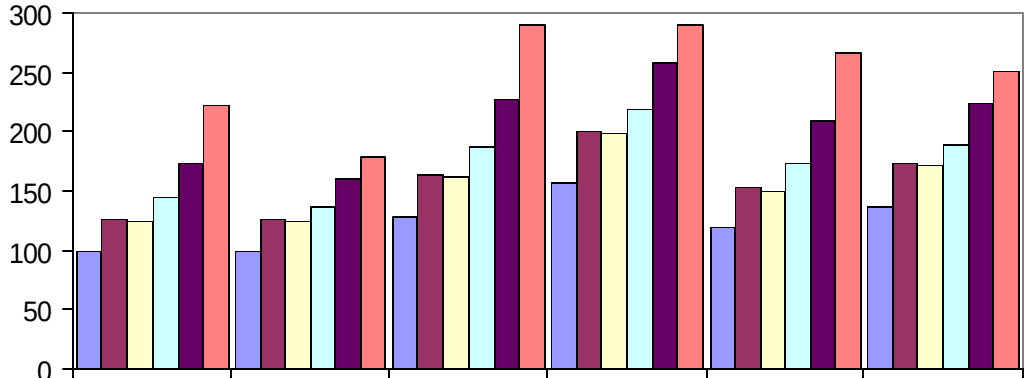


	Agriculture		Manufacturing		Services	
	1990-91	1999-00	1990-91	1999-00	1990-91	1999-00
Illiterate	100	100	130	156	122	143
Primary	134	124	174	194	163	178
Matric	147	143	193	227	180	208
Intermediate	181	161	237	254	222	233
Graduate	219	218	288	350	269	
Post Graduate	288	303	379	487	354	450

Similarly, in Sindh the relative return to education increased with the level of education, and the highest jump occurred in the case of graduation in all sectors, and in both years.

As expected, education level plays a significant role in wage determination, in all sectors, and regions during both years 1990-91 and 1999-2000. In Punjab the relative wage rate for postgraduates is less than three times the relative wage rate of the illiterate workers, in each sector during 1990-91, which turns to more than three times in 1999-2000 (see figure 2). Another noticeable point with respect to the return on education is the higher growth in relative wages after intermediate; this indicates the non-linearity in returns to completed years of schooling. A dynamic comparison of relative wage rates over the years indicates an upward trend in all three sectors of the Punjab province during the decade. However, the highest increase in relative wage rate appeared in the manufacturing sector, and lowest in the services sector.

Figure 3: ESTIMATED SECTOR-WISE RETURNS TO EDUCATION: SINDH 1991 & 2000



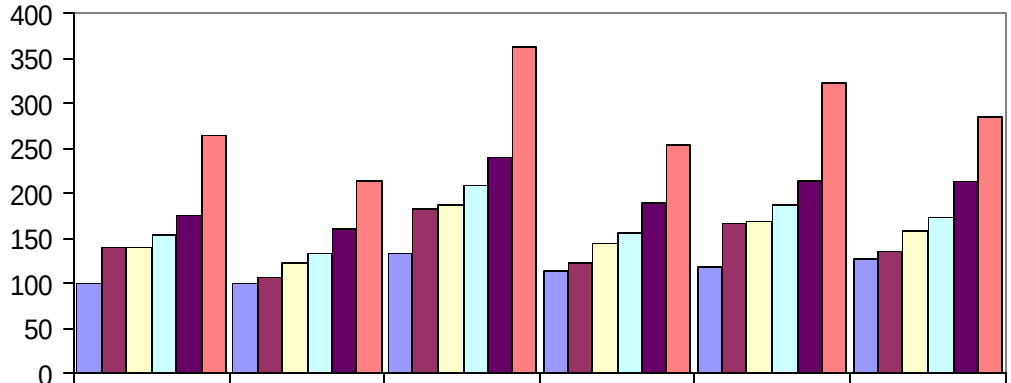
	Agriculture		Manufacturing		Services	
	1990-91	1999-00	1990-91	1999-00	1990-91	1999-00
Illiterate	100	100	130	158	121	137
Primary	127	127	164	201	153	173
Matric	125	125	163	200	150	172
Intermediate	145	137	188	219	174	189
Graduate	174	161	228	259	210	224
Post Graduate	222	181	290	290	267	251

Similarly, in Sindh the relative return to education increased with the level of education, and the highest jump occurred in the case of graduation in all sectors, and in both years (see figure 3). During 1990-91, return to post-graduation was relatively high, however, this pattern slightly changed in 1999-2000 and as compare to 1990-91 premium on post-graduation have

declined specially in agriculture and services sectors. This is because of a decline in the relative wage rates for higher levels of education in the agriculture sector, and stagnation in other sectors.

As in the case of Sindh and Punjab, relative wage rates disproportionately increased with the level of education in NWFP. The highest jump occurred in relative wage rates between graduation and post-graduation. In 1990-91, this increase was more than 50 percent, which reduced to 34 percent in 1999-2000; as compared to no schooling, the relative wage rate for post graduation is three times higher. Dynamic analysis shows that the growth in relative wage rate is high in the agriculture sector and low in the manufacturing sector, as compared to services (see figure 4).

Figure 4: ESTIMATED SECTOR-WISE RETURNS TO EDUCATION: NWFP 1991 & 2000

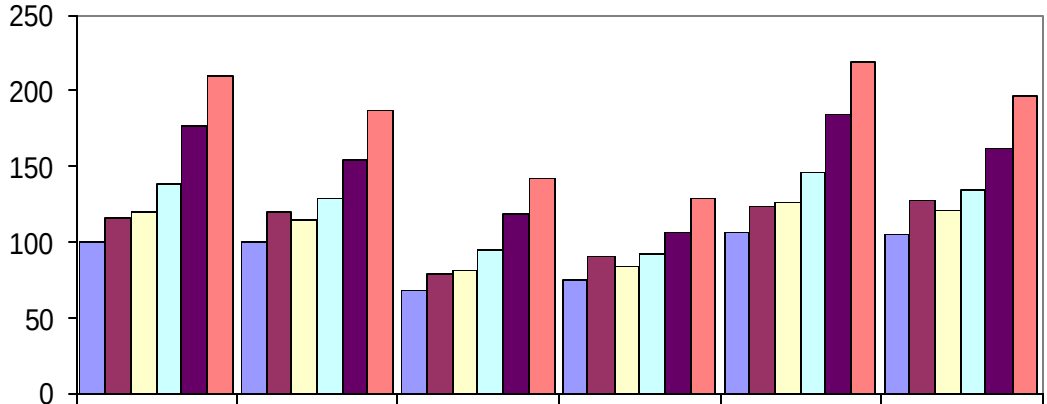


	Agriculture		Manufacturing		Services	
	1990-91	1999-00	1990-91	1999-00	1990-91	1999-00
Illiterate	100	100	133	115	120	127
Primary	139	107	184	123	166	136
Matric	140	123	188	143	169	159
Intermediate	154	134	208	155	187	173
Graduate	175	160	240	189	214	213
Post Graduate	264	215	363	254	324	285

In Balochistan also, relative wage rates increase disproportionately with level of education, and the highest increase in the relative wage rate is from intermediate to graduation. However, dynamic analysis presents a different picture as compared to the other three provinces. In 1999-2000 the relative wage rates in Balochistan declined in each educational category for the agriculture sector as compared to the relative wage rate in 1990-91; this may be due to drought and water shortage in the province. However, the remaining two sectors

also show the same trend and relative wages have been stagnant or have declined during the same time period (see figure 5).

Figure 5: ESTIMATED SECTOR-WISE RETURNS TO EDUCATION: BALOCHISTAN 1991 & 2000



	Agriculture		Manufacturing		Services	
	1990-91	1999-00	1990-91	1999-00	1990-91	1999-00
Illiterate	100	100	68	75	107	106
Primary	116	120	79	90	124	127
Matric	120	115	82	84	126	122
Intermediate	139	128	95	93	146	135
Graduate	177	154	119	107	184	163
Post Graduate	211	186	142	129	219	196

5. CONCLUSIONS

This paper has documented the sectoral distribution of wages and the returns to education in all four provinces of Pakistan, at two distinct points, which almost cover a decade of macroeconomic reforms. Interest in changing wages and returns to education has been motivated by the potential for a number of reasons: (1) macroeconomic theory to explain changing in income distribution in the developing world; (2) the availability of good individual-level data over a period spanning the major reforms; (3) the case of Pakistan is especially valuable because macroeconomic reforms were concentrated during the decade of 1990s. During this period stabilization measures were the key economic policy-taking place, which affect the every sector of the economy.

Using Standard Mincerian technique, we have found that the returns to education, though high for college and university graduate. We have also investigated the structure of wages both at the beginning of reform and after macroeconomic reform. Our descriptive analysis

reveals that there was some widening of the agriculture and non-agriculture wage differential. There is a disproportionate impact of macroeconomic reform in different provinces.

From the policy perspective, one may conclude that trade liberalization had a slightly equalizing influence on wages in accordance with Stolper-Samuelson theorem, but that this has come at the expense of reducing the level of wages. Moreover, there are evidences that this equalizing effect appears to have been more at the expense of reducing the returns to those with secondary education rather than increasing the pay of the less educated. It is important to note that such effects are not a consequence of the increasing supply of educated workers.

SELECTED BIBLIOGRAPHY

Adriamananjara, S and Nash, J. (1997), **Have Trade Policy Reforms Led to Greater Openness in Developing Countries?** *Policy Research Working Paper No. 1730, World Bank.*

Alan, Krueger B. and Mikael Lindahl (2001), **Education for Growth: Why and for Whom,** *Journal of Economic Literature, Vol. XXXIX, No. 4, pp. 1101-1136.*

Ashenfelter, Orley C. and Layard Richard (1986), **Handbook of Labor Economics,** Elsevier Science Publishers North-Holland, Vol. I & II.

Ashenfelter, O., Harmon, C. and Oosterbeek, H. (1999), **A Review of Estimates of the Schoolings/Earnings Relationship, with Tests for Publication Bias**, *Labour Economics*, 6: 453-470.

Barro, Robert J. and Jong Wha Lee (1996), **International Measures of Schooling Years and Schooling Quality**, *American Economic Review*, vol. 86(2), pp. 218-223.

Becker, Gary S. (1993), **Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education,** University of Chicago Press Third Edition.

Beyer, H., Rojas, P. and Vergara, R. (1999), **Trade Liberalisation and Wage Inequality**, *Journal of Development Economics*, 59(1): 103-123.

Cohen, Daniel and Marcelo Soto (2001), **Growth And Human Capital: Good Data, Good Results,** Technical Papers No. 179**,** OECD, http://www.oecd.org/dev/publication/tp1a.htm

Currie, J. and Harrison, A. (1997), **Sharing Costs: The Impact of Trade Reform on Capital and Labour in Morocco**, *Journal of Labor Economics*, 15: s44-s71.

Davis, D.R. (1996), **Trade Liberalisation and Income Distribution**, NBER Working Papers No. 5693.

de-Zeeuw, Maarten (1996), **The Household Integrated Economic Survey of Pakistan 1990-91: Internal and External Consistency,** *The Pakistan-Development-Review Vol. 35, No. 1, pp. 71-84*

FBS (Various Years), **Labour Force Survey,** Various Issues, *Federal Bureau of Statistics, Government of Pakistan.*

Kemal, A.R. (2003), **Structural Adjustment and Poverty in Pakistan,** *MIMAP Technical Paper Series No. 14,* Pakistan Institute of Development Economics

Khan, Shahrukh R. and Mohammad Irfan (1985), **Rate of Returns to Education and Determinants of Earnings in Pakistan,** *The Pakistan Development Review Vol. 24, No. 3&4, pp. 471-680.*

Lam, D. and Levison, D. (1992b), **Declining Inequality in Schooling in Brazil and Its Effects on Inequality in Earnings**, *Journal of Development Economics*, 37: 199-225.

Nasir, Zafar M. (1998), **Determinants of Personal Earnings in Pakistan: Findings from the Labour Force Survey 1993-94,** *The Pakistan Development Review Vol. 37, No. 3, pp. 251-274.*

Nasir, Zafar M. (1999), **Do Private School Produce More Productive Workers?** *The Pakistan Development Review Vol. 38, No. 4, pp. 937-952.*

Nasir, Zafar M. (2000), **Earnings Differential between Public and Private Sectors in Pakistan,** *The Pakistan Development Review Vol. 39, No. 2, pp. 111-130.*

O'Connor, D. and Lunati, M.R. (1999), **Economic Opening and Demand for Skills in Developing Countries: A Review of Theory and Evidence**, Technical papers No. 149, OECD Development Centre.

Pissarides, C.A. (1997), **Learning By Trading and Returns to Human Capital in Developing Countries**", *World Bank Economic Review*, 11: 17-32.

Psacharopoulos, G. (1991), **Time Trends of the Returns to Education: Cross-National Evidence**, *Economics and Education Review*, 8 (3).

Psacharopoulos, G. (1994), **Returns to Education: A Global Update**, *World Development*, 22 (9): 1325-1343.

Psacharopoulos, G. and Partrinos, A. (2002), **Returns to Investment in Education: A Further Update** , Policy Research Working Paper No. 2881, World Bank.

Ram, R. (1990), **Educational Expansion and Schooling Inequality: International Evidence and Some Implications**, *Review of Economics and Statistics*, 72 (2).

Robertson, R. (2000), **Trade Liberalisation and Wage Inequality: Lessons from the Mexican Experience,** *World Development*, 23 (6): 827-849.

SDIP (2001), **Social Development in Pakistan: Growth Inequality and Poverty,** Oxford University Press, Social Policy and Development Centre, Karachi

SDIP (2002-03), **Social Development in Pakistan: State of Education,** Oxford University Press, Social Policy and Development Centre, Karachi

Sunde U. (2001), **Human Capital Accumulation, Education and Earnings Inequality**, *IZA Discussion Paper No. 310.*