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Editorial Staff: Tele. No: 874385

Telefax: 0092 - 42 - 5714936

E-mail: lse@brain.net.pk

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Correspondence relating to subscriptions and changes of address should be sent to The Lahore Journal of Economics, 105-C-2, Gulberg III, Lahore - 54660 - Pakistan

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Contents **Vol. 4, 1999**

Efficiency Wages in Pakistan's Small Scale Manufacturing

Abid A. Burki*

Abstract

This paper investigates wage differentials between workers in subcontracting and non-subcontracting firms, using data from a recent survey of small manufacturing firms in Gujranwala, Pakistan. The paper finds that subcontracting workers receive a high wage premium and invokes efficiency wage arguments to explain this differential. The paper argues that due to a client/vendor monitoring problem it is optimal for subcontracting firms to pay higher than the market clearing wages. The use of Heckman's two stage procedure to test for sample selection bias fails to give such evidence. A decomposition of the wage differentials indicates that endowment differentials partly explain higher wages for subcontracting workers while the bulk of this wage gap is explained by differential returns to workers' attributes.

Introduction

Lack of appropriate incentives and effective competition in the factor markets of LDCs produce resource use inefficiencies resulting in under-or-over utilisation of inputs [White (1978)]. Lovell and Sickles (1983) have demonstrated that such inefficiencies are costly because they reduce the profitability of firms below their potential. In a recent article we have shown that manufacturing firms in India and Pakistan suffer from allocative inefficiencies which produce over-utilisation of capital and raw materials relative to labour and energy [Burki et al. (1997)]. Such inefficiencies in allocation of resources warrant adjustment policies for optimal resource allocation in these countries. However, this desire for competitive factor markets is hard to come by at least for labour resource where, due to government action or collective bargaining of workers, there are substantial inter-industry wage variations.

Even in the absence of such controls, wage differentials may arise from the decisions made by economic agents to maximise profits, especially when it is optimal to pay higher than the market clearing wages as effort

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inducing implicit contracts. This approach is lumped together as efficiency wage theories, which suggest that certain job attributes systematically effect wages.[1] The rationales provided by four distinct efficiency wage theories, for paying noncompetitive wages, are that higher wages reduce shirking incentives to workers, lower turnover costs, provide a pool of best qualified workers, and produce favourable morale effects [Yellen (1984)].[2] Krueger and Summers (1987) argue that in such cases eliminating wage differentials from the labour market would be inefficient and undesirable.

An alternative explanation for the wage differentials comes from the neoclassical competitive equilibrium model, which posits a single market where workers with equivalent human capital attributes received similar wages. The competitive model predicts equalising wage differentials across industries and sectors and regards observed wage differentials only reflecting compensation for non-pecuniary aspects of job matching. These alternative explanations for wage differentials, however, lead to entirely different policy implications.

In this paper, we investigate wage differentials for equally skilled workers in Pakistan's small scale manufacturing and explore whether the wage gap can be attributed to noncompetitive labour market models. More specifically, this paper examines the magnitude of wage differentials for workers employed in subcontracting and non-subcontracting firms in Pakistan's small manufacturing sector and finds important variations in relative wages of the two kinds of workers. The small firms we consider, operate in the private sector with no influence of labour unions or the government in employment and wage setting decisions. In other words, they are guided only by market forces and profit maximisation in wage setting decisions. We test for differences in relative wages by using recent data based on a survey of small manufacturing firms in Gujranwala, Pakistan. We invoke the efficiency wage argument to relate the observed wage premiums for subcontracting workers to the firms' profit maximisation decisions. We argue that in labour-intensive activities of small subcontracting firms the quality and in-time delivery considerations involve a client-vendor monitoring problem, which require subcontracting firms to pay higher than the market clearing wages. Along the way, we find apparent differences in personal characteristics of the two kinds of workers, which raise the possibility of nonrandom sorting, but

[1] Reviews of these studies are done by Yellen (1984), Shapiro and Stiglitz (1984), Dickens et al. (1989), and Lang and Khan (1990). For negative reviews, see Carmichael (1985, 1990). For empirical evidence, see Krueger and Summers (1987, 1988), Dickens and Katz (1987), Moll (1993), Arai (1994). The implications of efficiency wage models for developing countries are discussed in Burki (1996).

[2] The hallmark of this approach is that workers' effort crucially depends upon the wages paid by the firms.

Heckman's two stage procedure fails to detect any such problem. A decomposition of wage differentials indicates that differences in average endowments partly explain higher wages in subcontracting firms, but the bulk of this differential is explained by unequal returns. Our analysis leads us to conclude that observed variations in wages cannot be explained by the competitive model. The idea of efficiency wages helps to explain the large difference in the wage premium to workers in subcontracting firms.

The paper is organised as follows. Section 2 lays out the statistical model used to estimate the wage equations. Section 3 describes the data and discusses variable definitions. Section 4 presents the empirical results and interpretation of our primary findings. The results for Heckman's two stage procedure, to test for sample selection bias, are also discussed in the same section. Section 5 analyses wage differentials by decomposing them into differences in worker characteristics and differential returns. And section 6 summarises the basic results of the paper.

The Statistical Model

To examine the importance of non-competitive explanations of wage differentials, we assume distinct markets for subcontracting and non-subcontracting workers. Potentially, wages in respective markets are determined by

$$\text{Ln}y_k = X\beta_k + u_k \qquad \textbf{(1)}$$

Where $\text{In}y_k$ denotes the natural log of wages, X is a vector of observable characteristics, β is the corresponding coefficient vector, u_k is the error term such that $u_k \sim N(0, \sigma^2)$, and k = 1, 2 is for subcontracting and non-subcontracting workers, respectively.

To test the hypothesis that the coefficients for wage equations in the two sectors are statistically equivalent we conduct a Chow test, that is a test of hypothesis that a single equation characterises the entire labour market .

Estimation of (1) by ordinary least squares (OLS) may produce inconsistent estimates if the employers in their respective sectors select particular kinds of workers. Although we standardise for human capital and other controls, the wage differentials between the two sectors may be false if this standardisation is incomplete. More specifically, if sorting across the two sectors is driven by some unmeasured or unobservable characteristics affecting productivity (such as manual dexterity, initiative, innate mental ability, and honesty) then this hiring process would be nonrandom, which will produce omitted variable bias in OLS estimates. The extent of this bias may be proportional to the degree of failing to account for unmeasured

factors. Therefore, we employ Heckman's two stage procedure to purge the data of this statistical problem [Heckman (1979)]. Formally, this procedure is illustrated as follows:

Let d_i be a dummy variable that equals 1 if the ith worker is found in a subcontracting firm and zero otherwise. Also let Z_i be a vector of observed characteristics or explanatory variables in the model and Γ a vector of parameters. Now consider an unobservable binary index I_i determining a worker's sector allocation expressed as

$$I_i = Z_i \Gamma > 0. \quad (2)$$

We assume a random component in I_i represented by a standard normal random variable (u_{Ii}) subtracted from I_i, $I_i - u_{Ii} > 0$, or $u_{Ii} < I_i$. These random components are $u_{Ii} \sim N(0, \sigma^2)$. It implies that a worker will be observed in subcontracting firms or

$$di = \begin{cases} 1 \ iff \ I_i > 0 \\ 0 \ otherwise \end{cases}$$

This is a probit specification and the probability that the ith worker is found in subcontracting firm is

$$\Pr(\text{SUBCONTR}) \int_{-\infty}^{I_i} f(u)\, du, \quad (3)$$

where $f(u)$ is a standard normal density function. In other words, u_{Ii} represents the effects of unobserved worker characteristics that may sort workers in the two sectors. The disturbance term u_{Ii} is very likely correlated with the disturbance term u_{WI} from the wage equation. In other words, $\sigma\Gamma_{WI}$ or the covariance between u_{Ii} and u_{WI} will be non zero.

In the first step, we estimate the probit selection equation in (3) and obtain the inverse Mills ratio λ. In the second step, we use λ as an additional regressor in wage determination equations for respective sectors. This two-stage procedure produces unbiased estimates of wage equations. The insignificant coefficients for λ, however, are interpreted as demonstrating that unmeasured worker characteristics influencing wages and sector assignment are captured quite well by our model.

The Sample Survey

Data on subcontracting firms are often difficult to obtain, particularly in developing countries. Therefore, studies on subcontracting relationships usually rely on specially designed sample surveys. The wage and sample selection equations are estimated with data on male production workers employed in small manufacturing firms in Gujranwala and obtained from a

self-administered survey conducted in July-August, 1991. To conform with the official definition in Pakistan, small firms are defined as those that are un-registered under the Factories Act 1934 and employ fewer than 10 workers.[3]

Because sampled firms are un-registered, they represent an uncharted territory with unknown total population. Hence, the sampling frame is purposive in nature and does not always reflect a random drawing from the total population. The selection of manufacturing industries was randomly made from Standard Industrial Classification (SIC) at the four-digit level (See, CSO (1970)]. Out of a total of 182 manufacturing groups at the four digit level one group was randomly picked from each of the nine standard manufacturing divisions at the two-digit level. In random drawing, the industries which were found to be nonexistent in Gujranwala were, however, dropped from the survey. For cost effectiveness, seventeen firms were contacted for data collection from each industry group and all of them were included in the survey. The included firms were the first seventeen that we ran into during our field trips to the pre-identified clusters of firms for sampled industries.

The survey data were collected from 153 entrepreneurs/managers of enumerated firms and their 665 workers employed at the time of the survey, on two separate questionnaires: one each for workers and owners. The questionnaires were administered in personal interviews with owners and workers. Separate interviews for entrepreneurs/managers and workers were conducted in which detailed questions were asked in the local Punjabi language. Ambiguous answers to questions by respondents were subjected to further scrutiny in the second or third visits to the firms. The survey covers both subcontracting and non-subcontracting firms. The two sub-samples of subcontracting and non-subcontracting workers were obtained by a matching of workers' and owners' surveys, since information on subcontracting status was recorded in owners' questionnaire only. From the total sample of 665 workers, 31 unpaid family members were excluded, leaving a final sample of 634 workers: 208 subcontracting 426 non-subcontracting.

Definition of Variables

We estimate separate wage equations for workers in subcontracting and non-subcontracting firms by employing an extended version of the human capital model (1), which includes human capital variables (schooling, experience and a skill-specific experience variable substituting for tenure),

[3] This definition is consistent with the Federal Bureau of Statistics, Government of Pakistan's *Survey of Small Scale and Household Manufacturing Industries (SSHMI)* conducted periodically. However, up till 1976-77, the Federal Bureau defined small firms as those having a capital stock of less than Rs. 2 million.

and control variable for working conditions, payment system, personal characteristics and industry affiliations.

Some interesting issues arise in including tenure as a variable in our model. The years of tenure with a firm indicate accumulation of firm-specific human capital that increases workers' productivity in respective firms making such human capital investments. Therefore, in conventional earnings functions the variable for total experience and tenure are used to estimate returns to general and specific training. Sometimes, however, labour market conditions do not allow accumulation of firm-specific training due, for example, to the threat of raiding by their competitor firms.[4] As Guiding (1991) has found, tenure (experience in the current job) is not important in determining wages in the informal sector in less developed countries. Hence, we assume that returns to specific training are associated with skill-specific training instead of firm-specific training. For instance, the labour market in Pakistan's small manufacturing sector does not allow firm-specific human capital accumulation because accumulated skills are highly portable. Small firms are known for their operations with minimum of space and machines where, more often, they use similar locally manufactured adapted technologies and tools. Workers in these firms acquire skill-specific training by working as apprentices in one or more firms. As an example, skills acquired by electricians are useful in all firms in the electrical appliance industry. Similarly, welding is a skill commonly acquired to work in the informal manufacturing sector, which is equally useful in several industries. Because of skill-specific training, no rational employer pays for their training costs due to the threat of raiding by other firms.[5] Hence we introduce the *SKLEXP* variable, for skill-specific experience, to capture the effects on wages of specific training investments or experience in current skill. The starting date of acquiring the current skill is an important threshold and its precise identification is essential so that the *SKLEXP* variable is not a very noisy empirical construct. This threshold was identified by respondents in their responses while accounting for the experience in current skill.

Descriptive statistics for the working sample and definition of variables are reported in Table-1. It is interesting to note that mean monthly wages, years of formal schooling, and skill-specific experience are higher for workers in subcontracting than in non-subcontracting firms. More specifically, mean monthly wages are about 3 percent higher in subcontracting firms. Other notable differences are in years of work

[4] For example, Becker (1964) noted that for monopsonists all investments on their employees' on-the-job training may be regarded as specific training, since they face no competition from others. However, in perfectly competitive labour markets employers are under 'constant threat of raiding' and thus would have little firm-specific investment.

[5] For further details on the training system in Pakistan, especially in the informal sector, see Burki and Ubaidullah (1992) and Burki and Afaqi (1996).

experience *(EXPER),* years of training completed *(TRAIN),* and the proportion of married workers. These statistics indicate that there are differences in personal characteristics of the two kinds of workers, which also raise the possibility of sample selection bias.

In Pakistan's social system ***bradris*** are associated with particular professions.[6] Traditional craftsmanship of certain ***bradris*** are sometimes recognised as an important determinant of wages [Nabi (1998)].[7] Therefore, we include the ***bradri*** background of workers, which has diminishing importance in Pakistan's labour market. We can see that workers with various ***bradri*** origins are evenly spread across subcontracting and non-subcontracting firms. To investigate the industry effects we include the industry origin of the workers. The highest concentration of subcontracting workers is in bakery products, saw and planning mills, while non-subcontractig workers are mainly found in knitting mills, soap and detergents and the china and ceramics industries.

Table-1: Summary Statistics and Definition of Variables

		Subcontracting		*Non-subcontracting*	
Variable	Definition	Mean	Std.Dev.	Mean	Std.Dev.
SUBCONTR	= 1 if employer a subcontracting firm	---	---	---	---
LWAGE	Natural logarithm of monthly wage	7.16	0.54	7.05	0.73
SCH	Years of completed schooling	3.84	3.56	3.73	3.76
EXPER	Years in labour market	11.17	8.56	9.56	7.87
SKLEXP	Years of experience in current skill	7.94	6.98	6.13	6.05
EXP	Years in labour market before current skill	3.24	5.55	3.42	5.80
FAMSIZE	Number of other household members	7.39	3.14	7.53	2.77

[6] *Bradri* is an important element of the social system in Pakistan, which has its origins in the Hindu caste system. For centuries the social system in India and Pakistan centered around villages which were will-knit entities self-sufficient for all their economic and social needs on account of a social division of labour by which *bradris* were identified with particular professions, e.g. *lohar* (blacksmith), *mochi* (cobbler), *ansari* (weaver), *rajput* (landlowner and ruler), and *arain* (cultivator), etc. Although the power of the village has eroded during the past century, the traditional craftsmanship of particular *bradris* is sometimes recongnised (Nabi (1988); Nadvi (1990).

[7] For example, Nabi (1988) has shown that in the farm machinery industry in Punjab, Pakistan, *lohar* workers earn a premium due to their *bradri* origin. Moreover, he found that *lohar* entrepreneurs prefer workers from the *lohar bradri*.

WORKHRS	Number of hours worked per week	53.75	11.19	51.59	9.86
PIECE	= 1 if paid on piece-rate basis	0.19	0.40	0.39	0.49
MONTHLY	= 1 if paid on fixed weekly/ monthly basis	0.72	0.45	0.52	0.50
DAILY	= 1 if paid on daily basis	0.09	0.29	0.09	0.29
TRAIN	Years of completed training in current skills	2.47	1.79	2.19	1.80
HINCOME	Monthly household income other than the worker	2255	3983	2501	2943
URBAN	= 1 if lives in Gujranwala city	0.59	0.49	0.71	0.45
MARRIED	= 1 if married	0.53	0.50	0.44	0.50
SKILL1	= 1 if trained worker	0.72	0.45	0.63	0.48
SKILL2	= 1 if semi-trained worker	0.17	0.38	0.18	0.39
SKILL3	= 1 if untrained worker	0.11	0.31	0.19	0.39
BRADRI1	= 1 if rajput	0.20	0.40	0.16	0.37
BRADRI2	= 1 if lohar	0.14	0.35	0.09	0.29
BRADRI3	= 1 if arain	0.17	0.38	0.14	0.35
BRADRI4	= 1 if ansari	0.04	0.19	0.08	0.27
BRADRI5	= 1 if kashmiri	0.05	0.22	0.06	0.24
BRADRI6	= 1 if others	0.40	0.49	0.47	0.50
IND1	= 1 if in saw and planing mills	0.16	0.37	0.01	0.10
IND2	= 1 if in bakery products	0.28	0.45	0.03	0.17
IND3	= 1 if in printed cards and stationery	0.13	0.33	0.05	0.23
IND4	= 1 if in iron and steel foundries	0.09	0.29	0.12	0.32
IND5	= 1 if in jewellery and precious metals	0.05	0.21	0.06	0.24
IND6	= 1 if in electrical appliances and housewares	0.13	0.34	0.14	0.35
IND7	= 1 if in knitting mills	0.06	0.23	0.25	0.43
IND8	= 1 if in soap and detergents	0.01	0.10	0.18	0.38
IND9	= 1 if in china and ceramics	0.09	0.29	0.16	0.37
N	Sample size	208	---	426	---

Empirical Results

We expect positive signs for *SCH, EXPER, SKLEXP,* and negative signs for nonlinear terms $EXPER^2$ and $SKLEXP^2$. Due to the joint family system in Pakistan where other family members also work, workers from

large families are expected to be less compelled to work hard. Therefore, family size *(FAMSIZE)* is expected to be negatively related to wages. The coefficient for *MARRIED* is expected to be positive. Other things being equal, those who work more hours per week are expected to receive higher wages. However, the sign pattern for *WORKHRS* is not easy to determine from our sample because the work norms vary across firms, largely depending upon the demand patterns for respective firms, while the payments are mostly made on fixed weekly/monthly or daily basis.[8]

In a first run of the model, due to high collinearity between *EXPER* and *SKLEXP* both the experience variables were found to be statistically insignificant.[9] Therefore, to avoid this problem we replaced *EXPER* with *EXP*, which is a control variable for EXPER and explicitly measured by subtracting *SKLEXP* from *EXPER*.

Table-2 presents results of the OLS regression estimates for wage equations for full sample that includes the *SUBCONTR* dummy variable, and the two sub-samples for workers in subcontracting and non-subcontracting firms. A Chow test was used to test if a single wage equation characterises the entire labour market. The finding that the wage structure in subcontracting and non-subcontracting sectors is statistically equivalent would be treated as evidence in favour of the competitive model. By contrast, our results indicate that the coefficients for subcontracting and non-subcontracting wage regressions are statistically not equal, since our computed test statistic was greater than the critical value at the 1 per cent level. Hence, the two wage equations are structurally different, which implies that the workers in the two sectors are paid differently for similar characteristics. In other words, competitive explanations of the wage differentials for equally skilled workers may not be important in this particular data from Pakistan's labour market. This view is further corroborated by the evidence discussed below.

In all three regressions, the coefficients for *SCH*, *EXP*, and *SKLEXP* are positive and statistically significant at any reasonable significance level while the coefficients for EXP^2 and $SKLEXP^2$ generate the usual quadratic concave earnings profiles [Mincer (1974)]. By comparison, whereas an additional year of schooling raises wages by 2 per cent in subcontracting firms, it raises wages by 1.6 per cent in non-subcontracting firms. The

[8] The tests of specification for including *HINCOME* and *URBAN* variables in the wage equations were rejected by the *F*-test. The computed *F* values for the full, subcontracting, and non-subcontracting samples were 0.00035, 0.274, and 0.087, respectively which were less than the critical *F* value of 3.32 at the 0.05 level.

[9] The correlation between *EXPER* and *SKLEXP* was positive and high at 0.76 and 0.68 for subcontracting and non-subcontracting samples, respectively.

returns to *EXP* in the non-subcontracting sector are lower in the beginning years, which overtake subcontracting sector returns at about 16 years of experience. However, the reliability of the non-subcontracting sector's profile is doubtful since its coefficient is statistically insignificant.

A more meaningful comparison is provided by the cumulative wage growth for the two kinds of workers. These are estimates of skill-specific wage premiums that a typical worker earns as he accumulates experience in current skills. Our results indicate that the accumulation of skill-specific experience leads to a steeper experience-wage profile for subcontracting than for non-subcontracting workers since wage growth in the beginning and peak years is greater for subcontracting workers. More specifically, an average subcontracting worker gets about 23 per cent wage growth by the fifth year as against only 15 per cent for non-subcontracting workers. Moreover, peak earnings of 86.8 per cent occur at 35 years of experience in current skills in subcontracting firms, as against the peak growth of 43.1 per cent at 25 years in non-subcontracting firms. Whereas the average starting monthly wages at zero skill-specific experience are roughly the same in both the sectors,[10] a year of skill-specific experience yields a greater increase in subcontracting workers' wages. In other words, each additional year of skill-specific experience is valued more highly in subcontracting firms. The existence of this differential invokes the efficiency wage arguments discussed in more detail below.

The negative coefficient for *FAMSIZE* shows that other things being equal, workers who have larger families tend to earn less, but these coefficients are not significantly different from zero. Similarly, the coefficient for *WORKHRS* is statistically insignificant in all the models implying that wages are not determined by the length of the days worked. However, the negative coefficients for *WORKHRS* may be due to possible endogeneity between *WORKHRS* and *LWAGE*: workers with high wages may be working more hours per week. We deal with this problem by using a two-stage least squares approach where wages and hours worked are treated endogeneous. But the Wu-Hausman specification test fails to detect any such problem.[11] The two control variables for pay system, *PIECE* and *MONTHLY*, are also not significantly different from zero, except that the

[10] The starting monthly wages are Rs. 1010 and Rs. 908 in subcontracting and non-subcontracting sectors, respectively. They are obtained at the mean values of right hand variables.

[11] Implementing this test procedure, the coefficients for *WORKHRS* remain negative but statistically insignificant. The Wu-Hausman specification test fails to reject the null hypothesis that *WORKHRS* is exogeneous in either of the two equations. The test statistics were 0.689 and 0.726 for subcontracting and non-subcontracting regressions, respectively against the χ^2 critical value of 3.84 at the 0.05 level.

dummy variable *PIECE* is significant at the 5 per cent level for non-subcontracting workers. In other words, there is no premium for piece rate workers in subcontracting firms. Most *bradri* dummy variables are statistically insignificant except *BRADRI 2*, which shows that workers in non-subcontracting firms belonging to the arain caste earn a premium relative to the excluded category.

The positive coefficient for *SUBCONTR* in column 1 suggests that taking into account human capital and other controls, wages in subcontracting firms are on average about 16 per cent higher than in non-subcontracting firms. Although, subcontracting workers are relatively more educated and experienced, the magnitude of wage differential is substantially higher than the gross differential observed in Table-1. The existence of substantial wage premium for equally skilled workers across industries implies that the employers have motives other than opportunity costs of workers, such as effort elicitation. Similarly, the evidence on inter-industry wage differentials substantiates this point.

The industry wage effects are indicated by the industry dummy variables, which are generally statistically significant in Table-2. For instance, the coefficient for *IND1* for subcontracting workers implies that after controlling for human capital and other characteristics, an average worker in saw and planning mills earns 29.8 per cent lower wages than an average worker in china and ceramics. The large and significant magnitudes of industry dummies in all the regressions in Table-2 clearly show that factors other than opportunity costs are also relevant in explaining relative wage differentials.

A primary question for a non-competitive explanation of wage differential is to ask why high wage subcontracting firms do not cut wages. The answer could be that subcontracting relationships involve a client-vendor monitoring problem not found in the non-subcontracting sector. As a consequence, firstly, subcontracting relationships involve hard to observe quality and in-time delivery considerations. These monitoring considerations are adequately addressed by the high pay strategies of subcontracting firms. One piece of evidence for this is that firms that subcontract are less likely to rely on piece rates (evidence that the monitoring of output may be difficult) than those that do not subcontract. Secondly, the large industry wage differentials across subcontracting and non-subcontracting sectors may reflect monitoring costs, as is often argued in the efficiency wage literature. Lastly, the observed subcontracting pay premium could be interpreted as serving the twin functions of solving the monitoring problems and signalling clients that production will be on time and of the contracted quality.

Table-2: OLS Estimates of the Wage Equations
(Dependent variable is LWAGE)[a]

Explanatory Variable	Full Sample	Subcontracting	Non-subcontracting
Constant	6.42	6.54	6.42
	(40.66)	(35.28)	(28.45)
SCH	0.019	0.020	0.017
	(3.50)	(2.53)	(2.44)
EXP	0.031	0.035	0.023
	(3.47)	(3.72)	(1.77)
EXP^2 *X* 10^2	-0.075	-0.110	-0.038
	(-3.68)	(-3.52)	(-0.71)
SKLEXP	0.0398	0.050	0.034
	(5.43)	(5.28)	(2.99)
$SKLEXP^2$ *X* 10^2	-0.063	-0.072	-0.066
	(-3.68)	(-3.86)	(-2.00)
FAMSIZE	-0.011	-0.009	-0.004
	(-1.79)	(-1.23)	(-0.49)
WORKHRS X 10^2	-0.024	-0.057	-0.036
	(-1.22)	(-0.21)	(-1.16)
PIECE	0.205	0.114	0.233
	(2.24)	(0.81)	(1.92)
MONTHLY	-0.027	-0.003	-0.058
	(-0.33)	(-0.03)	(-0.52)
MARRIED	0.080	0.016	0.150
	(1.82)	(0.27)	(2.52)
SUBCONTR	0.147	---	---
	(3.76)	---	---
BRADRI 1	-0.011	-0.011	0.066
	(-0.21)	(-1.72)	(0.94)
BRADRI 2	-0.06	-0.128	-0.036
	(1.12)	(1.64)	(-0.51)
BRADRI 3	0.050	-0.088	0.138
	(1.03)	(-1.31)	(2.19)
BRADRI 4	0.016	-0.208	0.095
	(0.17)	(-0.87)	(0.92)
BRADRI 5	0.007	-0.11	0.044
	(0.012)	(-1.02)	(0.54)

IND 1	-0.374	-0.261	-0.267
	(-4.22)	(-2.31)	(-1.20)
IND 2	-0.381	-0.332	-0.469
	(-4.98)	(-3.04)	(-3.83)
IND 3	-0.355	-0.355	-0.292
	(-4.62)	(-3.24)	(-2.85)
IND 4	0.034	0.172	-0.015
	(0.46)	(1.30)	(-0.17)
IND 5	-0.529	-0.033	-0.720
	(-4.14)	(-0.19)	(-4.92)
IND 6	-0.249	-0.140	-0.269
	(-3.99)	(-1.44)	(-3.46)
IND 7	-0.097	0.117	-0.145
	(-1.31)	(0.93)	(-1.68)
IND 8	-0.291	-0.278	-0.293
	(-3.85)	(-1.24)	(-3.46)
Adj. R^2	0.57	0.57	0.59
F-statistic	32.66	11.40	24.58
N	634	208	426

Notes: Variables are defined in Table-1. *t*-statistics in parentheses are computed from White heteroskedastic-consistent standard errors.

The Selectivity Bias

Apparently, there are no constraints on workers' freedom to choose either subcontracting or non-subcontracting firms. However, the employers may be selecting particular kinds of workers. Therefore, we employ Heckman's two-stage procedure to purge the data of this statistical problem. The estimates for the maximised probit likelihood function for the full sample of 634 workers are presented in Table-3. The dependent variable is SUBCONTR that equals unity for subcontracting workers and zero otherwise. In the selectivity equation we include all human capital variables and personal characteristics important in capturing the quality of labour. We find little systematic relationship between workers' human capital characteristics and their being in subcontracting or non-subcontracting firms. Our results indicate that differences in education, experience, time spent in training and household income do not significantly affect the probability of being in the subcontracting versus non-subcontracting firms. Similarly, the probability for married workers and workers who belong to a particular ***bradri*** is not significantly different

from the base category. However, the probability of a worker found in subcontracting firms increases with the level of training. For instance, being a trained worker (SKILL1) raises the probability of employment in subcontracting firms by 18.2 per cent. Similarly, workers residing in Gujranwala city are 10 per cent less likely to get employment in a subcontracting firm. Moreover, for workers in saw and planning mills, bakery products and printed cards and stationary, the probability of being in subcontracting firms increases by 77.3 per cent, 61.9 per cent and 29.4 per cent, respectively. In contrast, being in knitting mills and soap and detergents lowers the same probability by 28.5 and 53.8 percentage points, respectively. In sum, most human capital variables do not play a role in selecting workers, but industry affiliations do affect this selection process.

Table-3: Maximum Likelihood Estimates of the Probit Selection Equation

Explanatory Variable	Coefficient	Asymptotic t-statistics	Change in Probability[a]
Constant	-0.746	(-2.31)	---
SCH	-0.029	(-0.65)	-0.0114
EXPER	-0.043	(-1.20)	-0.0169
EXPER^2	0.001	(1.27)	0.0004
SKLEXP	0.025	(0.69)	0.0098
SKLEXP^2	-0.0004	(-0.35)	0.0002
TRAIN	0.009	(0.11)	0.0035
TRAIN^2	0.004	(0.50)	0.0016
HINCOME	-0.000	(-0.59)	-0.0000
URBAN	-0.248	(-1.76)	-0.0975
MARRIED	0.006	(0.03)	0.0024
SKILL1	0.463	(1.49)	0.1820
SKILL2	-0.131	(-0.42)	-0.0515
SCH SKILL1*	0.038	(0.73)	0.0149
SCH SKILL2*	0.102	(1.69)	0.0401
BRADRI1	0.131	(0.73)	0.0515
BRADRI2	-0.077	(-0.37)	-0.0303
BRADRI3	0.227	(1.24)	0.0892
BRADRI4	-0.040	(-0.14)	-0.0157

BRADRI5	0.127	(0.45)	0.0499
IND1	1.967	(5.75)	0.7730
IND2	1.574	(6.30)	0.6186
IND3	0.748	(2.90)	0.2940
IND4	-0.149	(-0.60)	-0.0586
IND5	0.223	(0.75)	0.0876
IND6	0.152	(0.68)	0.0597
IND7	-0.726	(-2.99)	-0.2853
IND8	-1.370	(-3.86)	-0.5384
R^2	0.353	---	---
Log-likelihood	-278.420	---	---
N	634	---	---

Notes: Variables are defined in Table-1. Asymptotic t-statistics are computed from White heteroskedastic-consistent standard errors.

a) Partial derivatives evaluated at the mean of the dependent variable.

We take inverse Mills ratio from the probit selection equation and use it as an additional regressor in wage determination equations. This procedure produces unbiased estimates of wage equations. Results from the OLS regressions conditioned on selection are displayed in Table-4. The estimated coefficient for inverse Mills ratio (the correction factor) is negative but statistically insignificant in both sub-sectors, thus suggesting that we cannot reject the null that the covariance between errors in selection and wage equations is zero, $\sigma_{IW} = 0$. The insignificant coefficients for inverse Mills ratio demonstrate that unmeasured worker characteristics that influence wages and sector assignment are captured quite well by human capital and control variables and hence there is no evidence of selectivity bias. The selectivity bias corrected estimates in Table-4 differ trivially from the estimates in Table-2 that were not corrected for selectivity bias.

Table-4: Selectivity Bias Corrected Estimates
(Dependent variable is LWAGE)[a]

Explanatory Variable	Subcontracting	Non-subcontracting
Constant	6.65	6.36
	(15.74)	(28.60)
SCH	0.020	0.016
	(2.50)	(2.37)
EXP	0.035	0.025

	(3.63)	(1.94)
EXP² X 10²	-0.112	-0.048
	(-3.42)	(-0.88)
SKLEXP	0.050	0.034
	(5.25)	(2.96)
SKLEXP² X 10²	-0.072	-0.067
	(-3.88)	(-2.00)
FAMSIZE	-0.009	-0.004
	(-1.18)	(-0.52)
WORKHRS X 10²	-0.052	-0.034
	(-0.19)	(-1.18)
PIECE	0.112	0.223
	(0.79)	(1.84)
MONTHLY	0.001	-0.062
	(0.01)	(-0.56)
MARRIED	0.016	0.148
	(0.27)	(2.49)
IND1	-0.338	-0.597
	(-1.13)	(-1.48)
IND2	-0.403	-0.730
	(-1.47)	(-2.47)
IND3	-0.396	-0.404
	(-2.09)	(-2.74)
IND4	0.166	-0.017
	(1.22)	(-0.20)
IND5	-0.045	-0.736
	(-0.26)	(-5.13)
IND6	-0.155	-0.290
	(-1.38)	(-3.59)
IND7	0.146	-0.076
	(0.85)	(-0.62)
IND8	-0.205	-0.201
	(-0.599)	(-1.54)
Inverse Mills Ratio (λ)	-0.069	-0.263
	(-0.28)	(-0.99)
Adj. R^2	0.56	0.59
F-statistic	10.93	23.69
N	208	426

Notes: Variables are defined in Table-1. *t*-statistics in parentheses are computed from White heteroskedastic-consistent standard errors.

a) To save space, the estimated coefficients for *bradri* control are not shown.

Decomposition of Wage Differentials

The wage gap between workers in subcontracting and non-subcontracting firms is decomposed into differences in endowments (due to human capital endowments and personal characteristics of workers) and differences in estimated coefficients or effects of discrimination (due to differences in the structure of wage payments). We use Oaxaca's (1973) decomposition technique with the modification of unweighted average, also used by Holtman and Idson (1993). This decomposition is written as

$$\overline{LWAGE}^{sc} - \overline{LWAGE}^{nsc} = 0.5\Sigma(\beta^{sc} + \beta^{nsc})(\bar{X}^{sc} - \bar{X}^{nsc}) + 0.5\Sigma\,(\bar{X}^{sc} + \bar{X}^{nsc})\,(\beta^{sc} - \beta^{nsc}) \quad \textbf{(4)}$$

where superscripts *sc* and *nsc* are for workers in subcontracting and non-subcontracting firms, respectively, *LWAGE* refers to the mean *ln* wage, overbars on *X*'s indicate the sample means of the explanatory variables, and β's are the estimated coefficients.

The results from this decomposition are presented in Table-5 where we find that differences in average endowments on *SCH, EXP* and *SKLEXP* partly help to account for higher wages in subcontracting firms, but the bulk of this effect is explained by differential returns to these human capital attributes. In particular, higher value placed on *SKLEXP* or skill-specific experience in subcontracting firms explains a major portion of the higher observed wages. Similarly, higher returns to workers paid on monthly basis in subcontracting firms also explain the wage gap. On net, differences in human capital endowments explain part of the observed wage differentials, but these differentials are much less important than the differences in returns in explaining the wage gap. These results are in contrast with the predictions of equalising wage differentials in competitive equilibrium models. These general results are also corroborated by the second last row in Table-5, which shows that the differential in returns to attributes rather than differences in endowments are much more important in explaining the wage differential. The constant term depicts the differences in base wages that are interpreted as premium or rent to subcontracting workers. However, even after ignoring the constant term, as in the last row, the net total returns to coefficients act to more than explain the wage differential.

The wage differential to subcontracting workers cannot be explained as a premium offered by subcontracting employers to attract the best available workers, because our selectivity equation indicates no evidence of sorting by subcontracting firms. The idea of efficiency wages helps explain the large difference in the wage premiums to workers in subcontracting firms. Being in the private sector, small firms in Pakistan

have full control on their wage setting decisions. They seem to maximise their profits by setting higher than the market wages to solve their monitoring problem. The returns to formal schooling and skill-specific experience are higher in subcontracting firms, which tend to increase the wage gap. Subcontracting firms not only offer higher wages, but also offer steeper experience-wage profile.

Table-5: Decomposition of Wage Differentials

Variable	Due to endowments	Due to coefficients	Total effect
Constant	--	0.120	0.120
SCH	0.0020	0.0114	0.0134
EXP	-0.0051	0.0376	0.0325
SKLEXP	0.0748	0.1121	0.1869
FAMSIZE	0.0009	-0.0373	-0.0364
WORKHRS	-0.001	-0.01	-0.011
PIECE	-0.0347	-0.0345	-0.0692
MONTHLY	-0.0061	0.0341	0.0280
MARRIED	0.0075	-0.0650	-0.0575
BRADRI	-0.0015	-0.1040	-0.1055
IND	-0.2224	0.1332	-0.0892
Total	-0.1856	0.1976	0.012
Total (net of constant)	--	0.0776	-0.108

Conclusions

This paper investigates the wage differentials for equally skilled workers in Pakistan's small manufacturing sector, focusing on subcontracting and non-subcontracting firms. Using survey data of small firms in Gujranwala, Pakistan we find important variations in relative wages of the two kinds of workers, which cannot be explained by the competitive model. More specifically, our results show that subcontracting workers earn 16 per cent higher wages than their non-subcontracting counterparts. We explain this high wage premium to subcontracting workers by invoking efficiency wage arguments and argue that the quality and in-time delivery considerations for labour-intensive activities of small manufacturing firms involve a client-vendor monitoring problem, which influences the optimal wage for the subcontracting firms. The client/vendor monitoring problem necessitates high pay strategies for subcontracting firms. The paper also takes account of the possibility of selectivity bias by employing Heckman's two stage procedure, but fails to detect any such problem. A decomposition of our results indicates that endowment differentials between workers partly explain higher wages in subcontracting firms, but unequal returns to human capital and other attributes of workers explain the major portion of the wage gap. This evidence is quite contrary to the predictions of equalising wage differentials of the competitive models.

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Valuing Environmental Costs due to Automobile Pollution in Pakistan

M. Qamar uz Zaman

I. Introduction

In the current era, increased attention is being paid to protect the environment in developing countries. The concern stems primarily from recent advances in information concerning health problems associated with pollution. The extent of the deep-seated dangers present has motivated detailed studies and consequent pollution abatement programmes to be adopted by several countries. However, the evaluation of projects and policy reform for environmental effects in Pakistan has been rare. The task thus is posed to provide credible estimates of the benefits that can be provided by pollution abatement, and the corresponding costs.

Major pollutants emanating from vehicular emissions include carbon monoxide (CO), carbon dioxide (CO_2), sulfur dioxide (SO_2), particulate matter (PM10), lead (Pb), nitrogen oxides (NO_x), and ozone (O_3). The present study is an effort to estimate the social costs and benefits through the reduction of these pollutant emissions from motor vehicles in Pakistan. The approach applied is an empirical valuation procedure where costs and benefits are given monetary values, to get to a more socially desirable output level of production.

The next section of the paper provides a background description of the air pollutants emanating from motor vehicles and the associated health effects. Section-III gauges the costs resulting from these pollutants and also provides a detailed description of the procedure utilised for the purpose. Section-IV illustrates the corresponding costs of pollutant removal. The benefits and costs are assimilated in Section-V, and concluding remarks and recommendations are stated in Section-VI.

II. Background

Emissions in gasoline fueled vehicles occur primarily through the exhaust, engine crank case, carburetor, fuel line and fuel tank. Principal pollutants emitted from such vehicles are CO, HC, NO_x, and Pb. Pollutants, primarily in the form of PM10, NO_x, SO_2, CO, and HC, emitted from diesel fueled vehicles emanate incipiently from the exhaust.

Particulate matter: PM10 is suspended inhalable particulate matter with an aerodynamic diameter of 10μm or less. Particulate matter is discharged from a broad magnitude of sources including power plants,

industrial processes, vehicular traffic, and domestic coal burning. Adverse health effects linked to PM include increased mortality, morbidity, reduced lung function, and respiratory diseases such as pneumonia, asthma, and bronchitis. It is estimated that approximately 13.9 per cent of all annual world PM emissions are attributable to the transport sector.[1] Two separate studies in Lahore put the figure for the city at 14.7 per cent and 26 per cent respectively.[2] Ambient air concentrations of PM 10 are found to be dangerously high for almost all major urban centers in Pakistan (See Table-1).

Lead: Lead is an extremely hazardous, heavy metal. Discharges from vehicles are the sole biggest source of lead in the biosphere. Medical evidence shows that lead has significant adverse health effects, including the slowing down of the neurological development of children, hypertension and cardiovascular problems in adults. Lead additionally exacerbates the problem by impeding the use of catalytic converters in cars. Though a large total of countries now furnish low leaded or unleaded gasoline, consumers in Pakistan can only buy gasoline with a high concentration of lead (levels between 0.42 to 0.82 g Pb/l).[3] Studies conducted by researchers unveiled the fact that school children in Karachi had blood lead levels more than double the WHO limit.[4] As depicted in Table-1, ambient air concentration lead levels are hazardously high in several urban localities in Pakistan.

Carbon monoxide (CO): Carbon monoxide is a colourless and odorless gas. Absorbed through the lungs it bonds with hemoglobin (Hb) to form carboxyhemoglobin (COHb), which lowers the oxygen level in blood.[5] Intake of the gas also impairs perception and thinking, slows reflexes, and may cause drowsiness, angina, unconsciousness, or death (Romieu 1992). It is theorised that people most at risk to the effects of CO comprise those with extant cardiovascular or chronic respiratory problems, the aged, infant children and fetuses. Motor vehicles are the main contributors to anthropogenic CO emissions. Worldwide anthropogenic CO emissions for 1995 were estimated at 350 million tonnes, 59 per cent of which were contributed by the transport sector.[6] Wijetilleke et. al. (1993), meanwhile, estimate through a survey of twenty-one countries that 69.8 per cent of all CO emissions are attributable to transport. Comparable figures for Pakistan have been calculated to be much

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[1] Wijetilleke L. and Karunaratne R.A., Air Quality Management: Considerations for Developing Countries. 1993. Pg.65.
[2] EGC, Sectoral Study on Environmental Technology and Infrastructure, 1998. Pg.3-25. & Tariq N. and Ali W, NCS Sector Paper on Municipal Discharges. 1985.
[3] Faiz A., Weaver C.S., Air Pollution from Motor Vehicles, 1996.
[4] Naim P., Take a deep breath, 1996.
[5] Onursal B. and Gautam S.P., Vehicular Air Pollution - Experiences from Sevel Latin American Urban Centers. 1997. Pg.26.
[6] ibid. Pg.17.

higher. Two separate studies conducted in Lahore concluded that the contribution of traffic to CO emissions in the city were 92.8 per cent and 96 per cent respectively.[7] It has been assessed that the average vehicle in Pakistan emits 25 times the carbon monoxide emitted by a comparable vehicle in the USA.[8] However, though concentrations have been found to be high in several urban localities in the country they have not reached dangerous levels. Ambient air concentration levels for major cities in the country, and corresponding WHO guidelines are depicted in Table-1.

Nitrogen Oxides (NO_x): NO_x is a collective term used to describe two species of oxides of nitrogen: nitric oxide (NO) and nitrogen dioxide (NO_2), the main nitrogen oxides emitted by vehicles. NO_2 which is formed by the oxidation of NO, is generally regarded as being more important from the point of view of human health. Accordingly, data on health hazards, and standards and specifications are commonly stated in terms of NO_2 rather than NO_x. Exposure to NO_2 is linked with heightened susceptibility to respiratory infection, increased airway resistance in asthmatics, bronchitis, bronchopneumonia, and decreased pulmonary function.[9] Motor vehicles are known to be the main contributors to anthropogenic NO_x emissions. Worldwide anthropogenic NO_x emissions for 1995 were estimated at 93 million tonnes, 43 per cent of which were contributed by the transport sector.[10] Wijetilleke et al. (1993), meanwhile, estimate through a survey of twenty-one countries that 48.9 per cent of all NO_x emissions are attributable to transport. While other urban centers in Pakistan show a controlled level of NO_x emissions, the level in Karachi is found to be dangerously high, much above the ambient air quality standards proposed by the WHO. Table-1 shows concentrations for different urban localities in the country.

Ozone: Ozone is a strong oxidising agent, which makes it highly reactive. Ground level ozone is a major component of smog in urban areas, and vehicles are the leading anthropogenic emission source of its precursors. Adverse health effects caused by ozone include severe damage to lung tissues, optical and nasal irritation, coughing, thoracic pain, increased mucous production, chest tightness, fatigue, and debility. Emission levels in Pakistan are found to be well within WHO guidelines.

Sulfur dioxide: SO_2 is a stable, non-combustible, achromatic gas. The most important source of emissions of SO_2 are fossil fuel combustion,

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[7] EGC, Sectoral Study on Environmental Technology and Infrastructure, 1998. Pg.3-25. & Tariq N. and Ali W., NCS Sector Paper on Municipal Discharges, 1985.
[8] IUCN, The Pakistan National Conservation Strategy. Pg.83.
[9] Onursal B. and Gautam S.P., Vehicular Air Pollution - Experiences from Seven Latin American Urban Centers, 1997. Pg.26.
[10] ibid. Pg.17.

and the smelting of non-ferrous ores. Adverse health effects of the gas include coughing, phlegm, chest discomfort, and bronchitis. Annual global emissions of SO_2 are estimated at 294 million tonnes, from which 160 million tonnes are ascribable to anthropogenic sources.[11] Wijetilleke et al. (1993), estimate that approximately 5.8 per cent of SO_x emissions in the world emanate from the transport sector. Najeeb Murtaza (1991), estimates a similar figure of 4.47 per cent for Pakistan. Annual mean concentrations in most European cities are estimated to be below 100 $\mu g/m^2$.[12] Ambient air level concentrations are found to be higher than those prescribed by the WHO in the cities of Karachi and Lahore (See Table-1).

Table-1: Ambient Air Quality Levels in Pakistan ($\mu g/m^3$)

	PM10	Pb	CO	NO_2	O_3	SO_2
Karachi[13]	191.79	5.00	Na	1035.02	0.00	96.99
Lahore[14]	306.25	2.52[15]	2720.51	50.90	64.85	57.72[16]
Rwp & Ibd[17]	148.78	2.34[18]	Na	105.38	Na	Na
Peshawar[19]	na	3.09[20]	834.00	53.00	30.00	1.00
Faisalabad[21]	361.25	2.03[22]	2520.06	44.46	51.44	12.30
Multan[23]	518.75	1.61[24]	1890.04	38.06	42.51	6.61
Gujranwala[25]	281.25	2.39[26]	3178.71	45.87	58.91	6.81
Hyderabad	na	1.56[27]	na	na	na	na
Quetta	137.5[28]	0.67[29]	na	na	na	na
WHO[30]	70.00	0.50	10000.00	150	100	50

[11] Onursal B. and Gautam S.P., Vehicular Air Pollution - Experiences from Seven Latin American Urban Centers, 1997. Pg.19.
[12] Shah J.J., Nagpal T., and Brandon C., Urban Air Quality Management in Asia - Guidebook, 1997. Pg. 106.
[13] All figures for Karachi from : Brandon C., Valuing Environmental Costs in Pakistan: The Economy-wide Impact of Environmental Degradation, 1995.
[14] All figures for Lahore other than Pb and SO_2 are from: Punjab EPA - Mobile Laboratory Ambient Air Quality Data (Jun-Dec, 1996).
[15] Source: PCSIR, Lahore. Measurements taken 5 feet above ground level, December 1996.
[16] Source: Brandon C., Valuing Environmental Costs in Pakistan: The Economy-wide Impact of Environmental Degradation, 1995.
[17] PM10 and NO_2 figures for Islamabad from: EGC, Sectoral Study on Environmental Technology and Infrastructure:, 1998. Pg. 3-23. PM10 converted from TSP figures at the PM10/TSP ratio of 0.55.
[18] Source: Zaman M.Q. and Martin R.P., Phasing out Lead from Gasoline in Pakistan: A Benefit-Cost Analysis, 1999. Pg.47. The ambient air lead concentrations were estimated by Zaman et.al. by converting available blood lead level figures.
[19] All figures for Peshawar other than Pb are from: Dijk I.A. and Hussein M.H., Environmental Profile of NWFP, 1994. Pg.50.

III. Quantifying Health Cost Estimates for Pakistan

Given the absence of studies that explore how the frequency of specific health outcomes vary with variations in ambient air pollution levels for developing countries, dose-response functions generated from studies in industrialised states are commonly used. Dose response functions in their simplest form take the following state:

$$dH_i = \beta\ POP_i * dA^{31}$$

Where:

dH_i = change in population risk of health effect (i)

β = slope of the dose response function

POP_i = population at risk of health effect (i)

dA = change in level of air pollutant under consideration.

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[20] Source: Zaman M.Q. and Martin R.P., Phasing out Lead from Gasoline in Pakistan: A Benefit-Cost Analysis, 1999. Pg.46. The ambient air lead concentrations were estimated by Zaman et.al. by converting available blood lead level figures.

[21] All figures for Faisalabad other than Pb are from: Punjab EPA - Mobile Laboratory Ambient Air Quality Data (Jun-Dec, 1996).

[22] Source: Zaman M.Q. and Martin R.P., Phasing out Lead from Gasoline in Pakistan: A Benefit-Cost Analysis, 1999. Pg.49. The ambient air lead concentrations were estimated by Zaman et.al. by converting available blood lead level figures.

[23] All figures for Multan other than Pb are from: Punjab EPA - Mobile Laboratory Ambient Air Quality Data (Jun-Dec, 1996).

[24] Source: Zaman M.Q. and Martin R.P., Phasing out Lead from Gasoline in Pakistan: A Benefit-Cost Analysis, 1999. Pg.49. The ambient air lead concentrations were estimated by Zaman et.al. by converting available blood lead level figures.

[25] All figures for Gujranwala other than Pb are from: Punjab EPA - Mobile Laboratory Ambient Air Quality Data (Jun-Dec, 1996).

[26] Source: Zaman M.Q. and Martin R.P., Phasing out Lead from Gasoline in Pakistan: A Benefit-Cost Analysis, 1999. Pg.49. The ambient air lead concentrations were estimated by Zaman et.al. by converting available blood lead level figures.

[27] Ibid. The ambient air lead concentrations were estimated by Zaman et. Al. By utilising comparative Particulate Matter emission figures.

[28] Source: Gils H. and Baig M.S., Environmental Profile of Balochistan, 1992. Pg.26.

[29] Source: Zaman M.Q. and Martin R.P., Phasing out Lead from Gasoline in Pakistan: A Benefit-Cost Analysis, 1999. Pg.49. The ambient air lead concentrations were estimated by Zaman et.al. by converting available blood lead level figures.

[30] Wijetilleke L. and Karunaratne R.A., Air Quality Management: Considerations for Developing Countries, 1993. Pg.63.

[31] Shah J.J., Nagpal T., and Brandon C., Urban Air Quality Management in Asia - Guidebook, 1997.

Shah et. al. (1997), state "in spite of ... caveats ... dose response functions are highly useful in estimating the health impact of pollution in developing countries. Dose response functions being estimated for developing countries, such as in Chile and India, have been shown to correspond well with those from industrialised countries". Table 2 presents an inventory of appropriate dose response functions.

Having established a method to calculate the severity of health impacts, the task arises to determine monetary values per unit of health impact. The impacts as described by the dose response functions can be divided into three broad categories.

i) Mortality
ii) Morbidity
iii) Restricted Activity Days

Mortality: To place a value on premature death we utilise a human capital approach. Such an approach values an individual's life according to the net present value of his/her productivity. The supposition elementary in this approach is that the worth of a person is based on what he produces which, in turn, is mirrored in his earnings. Cropper et al, 1997, estimate an average loss of 10 discounted productive years due to pollution in India. Applying the same figure for Pakistan, and using a GNP/capita value of $ 407.11 and a discount rate of 13.5 per cent we arrive at a value of US $ 2457.98 for premature death from air pollution. In the United States, values of a statistical life, obtained from willingness to pay studies, are typically much higher than those obtained by the human capital approach. In the absence of such studies for Pakistan the WTP estimates of the United States are projected to Pakistani data for obtaining an alternative estimate.

Morbidity: To value morbidity we use a cost-of-illness approach. This approach incorporates the direct costs of medical treatment. The costs of treatment can be obtained from local public and private health systems, or estimates based on the observed costs in other countries. For the purpose of this study both methods have been used, to provide alternative estimates of treatment costs. For local documentation, primary data on treatment costs has been collected from the following medical institutions in Lahore: i) Ganga Ram Hospital, ii) Adil Hospital, iii) Defence Hospital, and iv) Central Military Hospital. For an alternative appraisal, costs have been projected from United States figures by rectifying the costs downward by a factor equal to the ratio of average GNP per capita.

Restricted Activity Days: To arrive at a value for restricted activity days, income per person per day is calculated. For this purpose it is estimated that there are 250 working days annually. The figure obtained of $ 1.63, is the value per restricted activity day. For minor restricted activity days, half the value, i.e. $ 0.81 is utilised.

Table-2: Dose Response Functions

PM10	
Premature Mortality	Change in mortality = 0.096 * change in PM10 * 1/100 * crude mortality rate * exposed population
Respiratory Hospital Admissions	Change in respiratory hospital admissions per 100,000 = 1.20 * change in PM10
Emergency Room Visits	Change in emergency room visits per 100,000 = 23.54 * annual change in PM10
Restricted Activity Days	Change in restricted activity days per person per year = 0.0575 * change in PM10
Lower Respiratory Illness in Children	Change in bronchitis = 0.00169 * change in PM10
Asthma Attacks	Change in asthma attacks = 0.0326 * change in PM10
Respiratory Symptoms	Change in symptom days per person per year = 0.183 * change in annual PM10
Chronic Bronchitis	Change in chronic bronchitis = 0.0000612 * change in annual PM10
SO_2	
Premature Mortality	Percentage change in mortality = 0.048 * change in SO_2
Respiratory Symptoms	Change in probability of cough per 1000 kids per year = 0.0181 * change in SO_2
Chest Discomfort	Change in the probability of chest discomfort per year = 0.010 * change in SO_2

O_3	
Respiratory Hospital Admissions	Change in respiratory hospital admissions per person = 0.0077 * change in daily 1-hour max ozone (ppm)
Minor Restricted Activity Days	Minor restricted activity days per person per year = 34.0 * change in 1-hour max ozone (ppm)
Respiratory Symptoms	Change in symptom days per person per year = 54.75 * change in 1-hour max ozone (ppm)
Eye Irritation	Change in eye irritations per adult per year = change in 1-hour max ozone (ppm)
Asthma Exacerbation	Change in asthma attacks per year = 68.44 * change in 1-hour max ozone (ppm)
Pb	
Non-fatal Heart Attacks	Change in non fatal heart attacks per 1 million of males aged 40-59 = 340 * 1 $\mu g/m^3$ change in Pb.
Hypertension	Cases of hypertension per 1 million of males aged 20-70 = 72,600 * 1 $\mu g/m^3$ change in Pb.
Premature Mortality	Change in mortality per 1 million of males aged 40-59 = 350 * 1 $\mu g/m^3$ change in Pb.
IQ Loss	Loss of IQ points per child = 0.0975 * 1 $\mu g/m^3$ change in Pb.
NO_2	
Respiratory Symptoms	Change in respiratory symptoms per year = 10.22 * change in 1 hour max NO_2 (ppm)
CO	
Quantitative effects uncertain	

Source: *Ostro (1994).*

A significant detail that justifies reiteration is that such valuation endeavours only seize partial benefits. Studies to evaluate health effects of air pollution do not capture life style alterations or physical and psychological distrurbances that are subclinical in character, or other intangible effects.

Table-3: Health Cost Estimates for Pakistan

Measure	US Data[32]	Ratio of[33] GNP/capita	Pakistan Data		Unit
			Local Documentation	US Conversion	
Average Income					
Per year			407.11		US$ per year
Per day			1.63		US$ per day
Value of a statistical Life					
Human Capital Approach			2,457.98[34]		US$ per death
Compensating Wage Approach	3,000,000	0.175176		52,552.80	US$ per death
Respiratory Hospital Admissions	6,306	0.175176	55.56	110.47	US$ per case
Emergency Room Visits	178	0.175176	8.89	3.12	US$ per case
Restricted Activity Days			1.63		US$ per day
Minor Restricted Activity Days			0.81		US$ per day
Respiratory Symptoms	5.35	0.175176	0.89	0.09	US$ per day
Lower Respiratory Illness in Children	5.32	0.175176	0.89	0.09	US$ per case
Asthma Attacks	29.84	0.175176	6.00	0.52	US$ per case
Asthma Exacerbation	29.84	0.175176	6.00	0.52	US$ per case
Chronic Bronchitis	132	0.175176	13.33	2.31	US$ per case
Chest Discomfort	5.97	0.175176	1.67	0.10	US$ per case
Eye Irritation	5.97	0.175176	0.89	0.10	US$ per case
Non-fatal Heart Attacks	28,334	0.175176	333.33	496.34	US$ per case
Hypertension	442	0.175176	20.00	7.74	US$ per case
IQ Loss	1,147	0.175176		20.09	US$ per point

Applying the health cost estimates computed in Table-3, and the dose response functions stated in Table-2, to ambient air concentrations previously tabulated, annual pollutant cost estimates are tallied for the nine major urban cities of Pakistan.

[32] Source for US Data: Shah J.J., Nagpal T., and Brandon C., Urban Air Quality Management in Asia - Guidebook. 1997.Pg.46.

[33] Based on: US GDP/capita = $ 23,240, Pakistan GDP/capita = $ 407.11. Source for US GDP/capita: Shah J.J., Nagpal T., and Brandon C., Urban Air Quality Management in Asia - Guidebook. Source for Pakistan GDP/capita: Pakistan Economic Survey 1998 figure of Rs. 18,320 converted at official exchange rate of 45 Rs./$.

[34] Net Present Value of GDP/capita discounted by interest rate @ 0.135 for a period of 10 years.

The results obtained for annual health cost estimates for the ten most populous cities of Pakistan due to air pollution are summarised in Table-4. Computed figures show more than 4300 premature deaths per year and over 925 million annual illnesses, an economic valuation of which suggests a monetary estimate of between $ 583 million and $ 1,121 million. As seen, Karachi and Lahore make up a massive proportion of the total costs. As populations decrease it is observed that the annual health costs of cities decline swiftly. So much so in fact that the proportion of costs of the last two cities (Peshawar and Quetta) is negligible. In the absence of any pollution emission figures at all for the rest of Pakistan, it is very difficult to estimate health cost values for the rest of the country. It is expected however that since the adverse effects of air pollutant emissions are concentrated in the larger cities of the country, therefore the non-computation of costs for Pakistan's remaining cities will not lead to a consequential discrepancy in the total cost figure for the country. PM10 is seen to be responsible for over seventy five percent of the health impact damages in the country. Almost all premature deaths attributable to air pollution are observed to accrue from PM10. Lead contributes to much of the rest of the damages. Of great concern is the resulting loss in intellectual capacity. Karachi and Lahore are seen to account for an estimated combined loss of 2.5 million points annually.

Table-4: Annual Health Cost

City	Annual Health Costs		Annual Health Costs Due to Vehicles[35]	
	Local Data	US Data	Local Data	US Data
Karachi	399.78	216.76	109.45	69.79
Lahore	314.53	159.93	56.78	33.16
Faisalabad	145.16	72.60	24.31	13.56
Rwp. & Ibd.	52.31	27.63	11.92	7.74
Multan	127.11	62.80	19.63	10.37
Hyderabad	2.43	2.04	2.19	1.84
Gujranwala	63.33	32.12	11.57	6.79
Peshawar	4.11	3.45	3.70	3.11
Quetta	12.52	6.28	2.13	1.19
Total:	1,121.28	583.61	241.68	147.55

[35] Calculated based on the following percentages for vehicular emissions out of total emissions: SO_2 - 4.47% (Murtaza N., 1991), PM10 - 13.9% (Wijetilleke L. et al, 1993), Pb-90% (Walsh M. et al, 1997), NO_x - 48.9% (Wijetilleke L. et al, 1993)

VI. Costs of Reducing Pollutant Emissions

Several pollutant reducing procedures are described in literature, and have been adopted by different countries. For the purpose of this study the most cost effective and practical techniques of these are evaluated for Pakistan's scenario. The costs of reducing the pollutants discussed are borne through three major procedures. First, the phasing out of lead from gasoline requires modifications in refinery specifications and a per liter addition of an octane raising substitute. Second, the reduction in the sulfur content of diesel fuel requires the building of capacity for hydrodesulfurisation of oil products. Third, the application of catalytic converters requires an extra purchasing cost.

i) Phasing out Lead from Gasoline: The costs of this procedure can be traced to two capital orgins. First, the current refinery specifications in the country require modifications which obligate a fixed cost investment. Second, the input of an octane raising substitute induces a per liter increment in cost.

Refinery Construction and Modification Costs: New construction and modifications to existing refinery plants are expected in order to produce the specified unleaded gasoline while retaining existing performance levels. This represents an additional cost which must again be weighed against the potential benefits associated with reductions in the lead content of gasoline in Pakistan. Industry sources suggest the installation of light naphtha isomerisation units, installation of feed preparation light naphtha hydrotreating units, and the reform of existing reformer units for the purpose. Zaman et al (1999), quote the construction and modification costs for Pakistan's three oil refineries, to be approximately 4,171 million rupees, for a reduction in lead levels from an average of 0.63 g/l to 0.15 g/l. Assuming a linear increase in costs for a further reduction in lead, the cost for total phase out is estimated at approximately 5,474 million rupees ($ 121.64 million).

Losses in Consumer Surplus: Switching from the production of highly leaded to unleaded gasoline will push up the price of gasoline, detrimentally affecting consumers. Working with petroleum industry cost estimates, it is estimated that removing the lead content of gasoline while maintaining current octane levels would increase petroleum production costs by 0.2953 rupees per liter.[36] The loss in consumer surplus associated with this cost increase may be estimated with reference to the following demand function for gasoline in Pakistan:

[36] Zaman et al (1999) quote an incremental increase of Rs. 0.225 per liter for a reduction of lead in gasoline from 0.63 g/l to 0.15/l. Assuming a linear increase in costs a value of Rs. 0.2953 is calculated for a total phase out.

$$Q_d = .572310000 - 53173000\ P + 63.33\ V + 324760\ Y$$

t-stats (-0.562) (-1.371) (1.471) (2.150)

$R^2 = 0.89,\ d = 1.6$

Where

Q_d is the quantity of gasoline demanded

P is the real 1987 price of gasoline per liter

V is the number of vehicles in Pakistan

Y is real 1987 per capita income

Keeping the aggregate of vehicles and per capita income consistent at present day levels, the above mentioned modification in price results in a 5,610,924 liter reduction in demand for gasoline and a loss in consumer surplus of 395,924,383 rupees in present terms.[37]

Effectiveness: 90 per cent of all lead emissions in urban areas are estimated to be attributable to traffic.[38] Hence 90 per cent of the adverse health effects occurring from lead emissions have traffic as their primary source. By totally removing lead from gasoline, 90 per cent of adverse health effects, and 100 per cent of adverse health effects due to automobile pollution are expectedly eliminated.

ii) Reduction in the Sulfur Content of Diesel: Supplementary construction and alterations to present refinery plants are anticipated in order to generate the specified reduction in sulfur content while maintaining standing performance guidelines. This presents an auxiliary cost which must once more be weighed against the associated potential benefits. Industry sources recommend the installation of HSD hydro desulfurisation units for the purpose. Refinery quoted costs for the installation of these units amount to a combined total of Rs. 5,882 million ($ 130.71 million) for a reduction in weight percent of sulfur content in diesel from 1.0 per cent to 0.2 per cent.[39]

Effectiveness: Najeeb Murtaza (1991), estimates that approximately 4.47 per cent of SO_2 emissions in Pakistan emanate from the transport sector. By removing 80 per cent of the sulfur content in diesel, it is estimated hence that

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[37] Present day vehicles: 2.083,668. GDP Deflator : 2.7984675. Income: Rs. 18,320. Real Income: Rs. 6546.44.

[38] Walsh M., Shah J.J., Clean Fuels for Asia: Technical Options for Moving Toward Unleaded Gasoline and Low Sulfur Diesel, 1997. Pg.8.

[39] Government of Pakistan, Report on Introduction of Environment Friendly Clean Fuels in the Country, 1996.

3.58 per cent of all adverse health effects occurring due to SO_2, and 80 per cent of adverse health effects occurring due to automobile pollution are eliminated. Additionally sulfur also exhibits particulate forming tendencies. Shah J.J. et al (1997) state that roughly 1.2 pounds of particulate is formed per pound of SO_2. Tariq N. et al (1985) estimate that Lahore has SO_2 emissions of 1,377 tonnes due to motor vehicles, and particulate emissions of 2,014 tonnes due to motor vehicles. Computing from the fact that 80 per cent of sulfur content in diesel will be removed, it is estimated that emissions in Lahore due to motor vehicles will reduce by 1101.6 tonnes. Applying the ratio established by Shah J.J. et al (1997), that leads to a reduction of 1321.9 tonnes (i.e. 65.64 per cent) of particulate emissions, it is estimated that approximately 13.9 per cent of all annual world PM emissions are attributable to the transport sector.[40] Hence it is approximated that 9.12 per cent of all adverse health effects for PM, and 65.64 per cent of adverse effects due to automobile pollution for PM will be reduced by the stated reduction in sulfur content of diesel.

iii) Application of Catalytic Converters: Tail pipe emissions of CO, NO_x and various organic compounds are addressed through the application of catalytic converters. These can lead up to a 90 per cent reduction in emissions.[41] Wijetilleke et al (1993), estimate through a survey of twenty-one countries that 69.8 per cent of all CO emissions and 48.9 per cent of all NO_x emissions are attributable to transport. Hence the utilisation of catalytic converters is expected to lead to corresponding 62.8 per cent and 44 per cent reduction respectively in adverse health effects. Extra purchasing costs of vehicles equipped with such a device are estimated at US $ 200 per unit by Shah J.J. et al (1997). Naim P. (1996) meanwhile describes the development of a low cost catalytic converter by students of the NED University of Engineering and Technology, Karachi. Making this commercially available could be a possibility. Considering however the low level of NO_x pollution in the country, and the unavailability of quantitative effects associated with CO, the application of catalytic converters is not considered for the purpose of the cost-benefit analysis in this study.

V. Results

In this section the results of the study are presented. Consumer benefits from cutbacks in pollutant emissions are determined and exhibited. Then each of the costs and benefits discussed in previous sections are combined to arrive at an overall benefit-cost ratio for proposed policy switches. The section is completed with a sensitivity analysis of the results obtained.

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[40] Wijetilleke L. and Karunaratne R.A., Air Quality Management: Considerations for Developing Countries, 1993. Pg.65.

[41] Shah J.J., Nagpal T., and Brandon C., Urban Air Quality Management in Asia - Guidebook, 1997. Pg.56.

Benefits: The population will gain from reduction in pollutant emissions through the application of the procedures described in the previous section. 90 per cent of all adverse health effects due to lead emissions, 9.12 per cent of those due to PM10 emissions, and 3.58 per cent of those due to SO_2 emissions shall be eliminated. Benefit figures for each city based on these percentages are calculated and presented in Table-5.

Table-5: Annual Benefits Through the Reduction in Pollutant Emissions in Pakistan ($ '000,000)

City	PM10	PM10	SO_2	SO_2	Pb	Pb
	Local Data	US Conversion	Local Data	US Conversion	Local Data	US Conversion
Karachi	28.23	13.75	0.28	0.40	56.39	47.35
Lahore	27.05	13.17	0.02	0.04	17.25	14.49
Rwp. & Ibd.	4.21	2.05	-	-	5.49	4.62
Peshawar	-	-	-	-	3.70	3.11
Faisalabad	12.74	6.21	-	-	4.88	4.10
Multan	11.36	5.53	-	-	2.32	1.95
Gujranwala	5.44	2.65	-	-	3.27	2.75
Hyderabad	-	-	-	-	2.19	1.84
Quetta	1.09	0.53	-	-	0.46	0.38
Total:	90.12	43.89	0.30	0.44	95.95	80.59

Summing health benefits yields total annual benefits from the proposed policies of $ 124.92 million and $ 186.37 million respectively for the two approaches used (local data and US conversion). Assuming a 13.5 per cent discount rate and an infinite time horizon, the present value of these annual benefits is $ 925.3 - $ 1380.52 million.

Costs: The costs of the proposed policies fall into two categories: annual losses in consumers' surplus as a result of higher gasoline prices, and initial refinery construction and modification costs. Annual losses in consumers' surplus were found to equal $ 8,798,320. Assuming, once again, a discount rate of 13.5 per cent, the net present value of the annual loss in consumers' surplus equals $ 65,172,740. One-time refinery construction and modification costs were found to equal 252.35 million dollars. The net present value of total costs thus equals $ 317.5227 million.

Benefit-Cost Analysis: The benefit-cost ratio for the proposal is found by dividing the NPV of total benefits by the NPV of total costs. Doing this we find a B/C ratio of 2.91 for US converted data (benefits outweigh costs by 2.91 to 1), and a ratio of 4.35 for locally documented data (benefits outweigh costs by 4.35 to 1). IRR values are found to be 46.01 per cent and 70.36 per cent respectively. With positive values associated to NPV and the B/C ratio, in addition to an IRR value greater than the cost of capital, the adoption of the proposed pollutant reducing policies is strongly recommended. Calculations are summarised in Table-6.

Table-6: Summary of Policy Analysis

	Using Local Data	**Using US Converted Data**
Net Present Value of Benefits (million dollars)	1380.5190	925.3333
Net Present Value of Costs (million dollars)	(317.5227)	(317.5227)
Cumulative Net Present Value (million dollars)	1062.9960	607.8106
Benefit-Cost Ratio	4.347778	2.914227
IRR	70.36 %	46.01 %

VI. Conclusions and Recommendations

i) Most consequentially (and most clearly) we find that the economic benefits of removing the lead content of gasoline, and reducing the sulfur content of diesel outweigh the associated costs. We thus conclude that the policies, or offshoots of them, should by all means be executed. It is however observed that the benefits accruing are not uniformly distributed.

ii) By far the greatest automobile related pollution, and therefore the greatest damage occurs in Karachi and Lahore, followed by Faisalabad, Gujranwala, and Multan. Automobile pollution damages in Quetta, Peshawar and other smaller cities are essentially nonexistent as automobile traffic and therefore ambient air pollutant levels are relatively low. In these smaller cities, the costs associated with the removal of lead from gasoline will likely exceed the benefits. It is therefore recommended that a flexible programme to restrict the sale of leaded gasoline and high sulfur content diesel in major urban areas such as the cities identified above, be implemented.

iii) It is suggested that the government provide market incentives to producers for the lead phase out and sulfur reduction approaches. Since the petroleum sector is already heavily taxed it may be constructive for example to reduce the level of development surcharge currently levied.

iv) Since this study had certain unavoidable limitations with regard to data, it is suggested as a final recommendation that work be expanded in collecting up-to-date pollution emission data for the cities examined and for those not examined by this study.

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Population Growth - The Social Development and Poverty Dimension

M.S. Jillani*

The debate over the relationship of population and development is now more than 200 years old, starting with the treatise on population by Malthus, in 1798. The increase in population, ever since, has remained a matter of concern for economists and development planners. The most recent high point of the issue was witnessed at Cairo in September, 1994. The conference which was attended by more than 10,000 persons from all over the world ended with an agreement on the issues involved in the growth of population and the economy. The outcome was a Plan of Action for the next twenty years, which would concentrate on Reproductive Health in order to obtain, "a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity in all matters relating to the reproductive system and its functions and process". This can be a turn-around in global efforts for human health and welfare, if properly implemented.

Malthus had made the prediction that the world will meet a disaster due to the geometrical progression of population which would outstrip the increase in food resources. During the two hundred years since Malthus published his famous essay, the world population has increased almost six times, reaching the figure of 5.5 billion in 1994 and 5.8 billion in 1997 - from less than 1 billion in the times of Malthus. But contrary to Malthus's apprehensions, food production per capita during the two centuries has risen rather than declined. Wherever the disasters have struck, they were more due to mal-distribution of resources rather than shortages at the global level. The famines in Africa, parts of China, or elsewhere have taken place in spite of surplus food lying in the industrial and advanced countries. The problem was that famine - stricken countries did not have the economic resources to buy food from hard currency nations. The argument thus can be that the real problem behind world hunger is the lack of economic resources rather than the global food production, just as economic backwardness is responsible for disease, pestilence, squalor, and lack of social and economic security. This inequality is still strongly present among the nations which leads to circumstances creating pockets of poverty.

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* Dr. Jillani has a Ph.D. in Sociology from the University of Chicago. He is a former Secretary to the Government of Pakistan.

The falsehood or near falsehood of the Malthusian hypothesis can have many explanations. The most plausible reason for averting the Malthusian calamity caused by shortage of food versus galloping population growth is the fast progress of technology, rise in the standard of living promoted by industrialization, and most of all, a decline in birth rates in the industrial countries – now being followed by the developing nations. This gave birth to the slogan "development is the best contraceptive". This is however, an over simplification of the process. Development does bring down the population growth rate but it also has led to serious distortions within the society through mal-distribution of incomes and services, both at the national and international level. This has resulted in high population growth rates in low income segments and lower growth in the high income areas. More than 70 per cent of the world population belongs to the former category - the same is true for Pakistan. Since bringing prosperity to low income groups is a slow process, the planners run to the adoption of family planning as a tool to contain population, applying it even through coercion, without paying attention to the socio-economic factors that bring about prosperity which would bring down population growth rates.

While the majority of thinkers and development practitioners would not have any quarrel with the adoption of family planning as a step towards economic development, there is no doubt that population cannot be controlled without social and economic development and the alleviation of poverty. Apart from other considerations, which poor family would like to limit its size, when there is a high probability of infant deaths and when there is a need for children to provide economic support to the family, starting from a young age?

In spite of divergent views, it remains a fact that a fast growing population retards economic and social development in a free economy. High population growth rates are not the result of high birth rates; birth rates have always been higher than what would be considered prudent. The difference has been made by a very fast decline in death rates. Until the nineteenth century, a large number of people, especially children used to die, thus the net increase in population was small. The times changed with the advancement of medical science and greater awareness of health problems which raised the expectancy of life. Modernisation of agriculture and technological break-through in the industrial countries decreased the need for manpower which, alongwith liberal values, brought down birth rates. The developing countries of today will go through the same phenomenon as they progress economically. The East Asian countries have proved that the whole process of transition from under-development to development can be squeezed into a fraction of the time taken by Europe or

North America. However, the problem of poverty remains acute and the incidence may be increasing.

The jargon of sustainable development is new but the idea is not. Had there not been sustainable development in the past centuries, the world would have collapsed long ago. The urgency has emerged due to the widening gap between the aspirations for better life, by larger population, and uneven development and mal-distribution of resources at the local and global level. The most important resource is food and agriculture. Agricultural production has increased fast but the price has been paid in the shape of serious toxicity caused by chemical pesticides and fertilizers, and similar other practices. In turn, the additional use of water has led to widespread salinity and water logging, especially in countries with canal irrigation systems. The green revolution and the magic seeds seem to be reaching their upper limit of production and there are visible signs of a decline in productivity - starting with the highly developed countries. It only means that we are fast reaching the limits of growth, at least in agriculture - though slightly slowly and differently - from that predicted by the Club of Rome.

The situation could improve appreciably, if there were better distribution of food resources. In 1994, about 25 per cent of the population of the world living in developed countries was consuming about 74 per cent of the food resources of the world. During 1980 and 1991, the index of food production per capita increased only by 18 per cent which is lower than the population growth during this period. This serious situation is not an easy one to combat. Disparities within the regions, and in many cases within the nations are glaring. Even within communities, the upper income groups flourish at the expense of the poor - just as in 1995, 20 per cent of the world population living in the richest countries, had 82 times the income of the poorest 20 per cent. In the developing countries, during the period 1984-94, 32.2 per cent of the population lived below the poverty line - naturally their share is eaten up by those at the upper rung of society. Even if the population is drastically reduced, the crunch of food shortages would continue due to mal-distribution, which is an economic and social problem, besides the vagaries of nature like droughts, floods, new pesticide-resistant pests, desertification and changes in the coastal regions.

However, a far more serious threat to food resources is due to the switch-over from food crops to cash crops which is also encouraged by some governments in order to earn foreign exchange and promote industry. It is another matter that the food grains have to be imported to compensate the local shortage at a cost higher than the foreign exchange earned through the export of cash crops. A second threat to agriculture is also economic but with strong social overtones. The benefits of modern inputs generally flow

in the direction of the large farmer who has the means to buy them and can also understand the intricacies of using chemicals without harm. He also has the resources and means to stock his product and dispense it at the right time. This pushes the small farmer to marginal lands. Since the small farmer cannot afford the expensive inputs any longer, he is liable to abandon or cheaply sell his land and change his occupation or move to the city. Most of this land is lost by agriculture as it could end up in the hands of the industrialist or housing hawks – if it is near an urban area exacerbated by low prices of agricultural products and high cost of inputs which leave a low margin of profit, coupled with the social pressure and influence of the big landlords.

The second major source of economic sustenance is industry. A growing number of developing countries receive a greater share of their GDP from the industrial sector. The growth of the industrial sector is invariably accompanied by an expanding services sector. Combined, they erode the importance of agriculture, and the level of exploitation of the rural areas and the rural population increases. The nature of agricultural produce changes in favour of the raw materials needed by industry both nationally and internationally. The out-bidded small farmer and the younger rural population thus migrate to the urban areas where industry and the service sector have the jobs and there exists comparative respectability resulting from anonymity. However, the concentration of industries in the urban areas leads to squalor, disease, congestion and poverty of a different kind - lack of shelter and serious pollution as the city grows in size. There is a tendency for the creation of more urban areas as indicated by the urban population growth rate, particularly in the developing countries which is much higher - 4.3 per cent as compared to 1.2 per cent in the industrial countries. This trend needs to be arrested through the dispersal of industries and better conditions of living in the rural areas. This is not an easy task. As such, simultaneous action is needed to (i) provide facilities in the urban slums to improve the quality of life of those who have already landed in the cities, (ii) take policy steps to disperse industries and discourage their concentration in the cities, and (iii) provide services in the rural areas which would keep the rural population at home as long as some source of employment is there.

While discussing the relationship between population and development, the factor of energy is somehow by-passed. In fact, the supply of energy is a pre-requisite for development and deserves close attention. It is needed for industry, agriculture, transport and simply living - irrespective of the level. The importance of energy in development can be gauged from the amount of commercial energy consumed, which in 1995, was 5118 Kg (oil equivalent) per capita in the high income countries as compared to 198

Kg per capita in the low income and 1139 Kg in middle income countries. The major sources of large scale energy consumption are fossil fuels, hydro electricity, thermal power and nuclear energy. The use of wood is on the decline as the forests are depleted. However, there are serious problems being created by the burning of fossil fuels and thermal electricity production as they cause pollution and environmental degradation. Hydel power capability is limited to proper water resources which are limited. The only clean and inexpensive source is nuclear energy which is denied to the developing countries for political reasons. In the given situation, developing countries will have to resort to every possible means of energy given their potential resources. However, the combination of energy production can be very tricky, economically as well as socially. The potential damage to the environment can reach unmanageable proportions if the pollution factors are not given a serious thought.

The provision of social services is of paramount importance in the context of balanced pollution and economic growth. Social Development as a concept is not new in the international academic and research circles. It was being discussed in various forums even in the 1950's but it has started receiving attention in concrete form only recently when the World Bank, IMF and various agencies of the United Nations realised that the development of social sectors was necessary for social and economic progress. However, this 'discovery' was really not that sudden. In fact, the Developing World could not become an effective market for the industrial countries unless cheap labour of the South were used - and for that it had to be educated, skilled and healthy. Likewise, the consumers had to be reasonably modern to create a demand for new amenities of life. The end of the cold war played its own role in this change of heart as the defence industries started converting themselves into consumer goods products.

The assertion above may look biased but a comparative look at the situation in the developing and the industrial countries will explain the point. Besides the abject poverty in most countries of the developing world, the basic rights and needs of the individual are not being made available to the majority of the population as compared to the industrial countries. To start with, the life expectancy at birth, in the developing countries in 1995 was only 62.2 years as compared to 74.2 years in the industrial countries; it was as low as 51.2 years in the least developed countries. The population of all developing countries was 4.39 billion in 1995 as compared to only 1.23 billion in the industrial countries. It meant that almost four-fifths of the world population had a life expectancy about ten to twelve years shorter than that of one/fifth of the population. Due to this variation in life expectancy, the years of life lost in the developing countries in 1992 stood

at 49 and 92 in the least developed countries as compared to 13 in the industrial countries.

The general indicators of health are equally dismal. In 1993, there were 76 doctors for 100,000 persons in the developing countries compared with 287 in the industrial countries. Since most of the population of the world lives in the developing countries, the doctor-population ratio was 122 for 100,000 people for the entire world. Access to health services in the developing countries in 1995 was 80 per cent while 71 per cent of the population had access to safe water supply and 30 per cent had sanitation facilities. In 1996, 95 per cent children in the developing countries died before the age of five; in the least developed countries this ratio was 171 per thousand live births. The expenditure on health in the developing countries in 1990 was far below that in the developed countries - 2.7 per cent in the low and middle income countries and 6.9 per cent in the high income countries.

These are sombre statistics. They indicate the condition in which the vast majority of the population of the world lives. Every increase in population makes the situation more difficult and adds to the misery and suffering of the poor population. The difference is equally well-marked at the national and regional levels as the access of different groups of population to health facilities varies according to income, occupation and geographical location. However, the most significant dearth of health facilities is found in the rural areas where more than 63 per cent of the population of the developing countries lives (1993 figures). The reluctance of doctors and paramedical staff to serve in the rural areas, non-existence of medical or health centres, equipment and medicines exacerbate the problem further. Absence of communications and other infrastructure makes the situation still more difficult particularly in the remote desert, mountainous or coastal areas. Women suffer more in this situation. Apart from receiving poor attention as compared to men, 488 women have to pay with their lives during child-birth for every 100,000 live births every year; in the least developed countries their number is 1100 while it is only 30 in the industrial countries. The mortality rates are about 9 per thousand population for all developing countries and 16 in the least developed countries; but in some areas it is as high as 22 per thousand population. Other health hazards such as impure drinking water, lack of sanitation, malnutrition exist in addition. The high death rates as such lead to high fertility which is a way to compensate the losses incurred by death. The pre-occupation of health personnel with medical problems does not allow them to even refer to preventive measures including family planning.

The situation of education in the developing countries is equally dismal. In 1992, 900 million adults in the developing countries were illiterate, out of whom 600 million or two thirds were women. In 1994, the adult literacy rate was 69.7 per cent in the developing countries. 80 million children were out of school. The situation of the 86 per cent children enrolled in primary school during the same year was not good either - only 51 per cent of primary school entrants moved over to the secondary stage. In the least developed countries, only 17 per cent primary school students were admitted into secondary schools. The condition of women was worse as only 34 per cent females reached the secondary school stage. For the least developed countries, the figure was 12. A scrutiny of individual countries does not suggest any major change in this scenario during the last seven years.

The situation of education has a direct bearing on social and economic development as well as attitude towards population planning. In 1995, the developing countries spent only 3.8 per cent of GNP on education as compared to 5.2 per cent in the industrial countries; some nations were spending as little as 1 to 2 per cent of their GNP on education. The pupil-teacher ratio, in 1990, in all developing countries was 33 while it was as high as 45 in the least developed countries. Low literacy level, meagre schools enrollment, inadequate number of schools and congestion due to high pupil-teacher ratios make even the existing educational system ineffective and result in low standards of education. Three major areas stand out in the context of education. First, universal adult literacy needs to be achieved so that the entire population could actively and intelligently participate in the process of development. Second, 100 per cent enrollment in the primary schools, particularly the females, should be ensured. The drop-out rate both at the primary and the secondary levels is very high as indicated by the gap between the number of children enrolled in the first grade and those reaching secondary school. This wastage should be plugged by proper legislation and strict inspection and monitoring measures.

There is hardly a need to stress that education, especially female education, is the most important deterrent to large families besides being a powerful instrument for improving levels of living. The developing countries should not grudge allocating more resources to education and human resource development by diverting funds from sectors having short term goals rather than those with nation-building potential.

During the last two decades or so, much rhetoric has been spewed about women development. However, the burden of centuries weighs heavily on development programmes for women. They suffer from

deprivation of the worst kind in respect of literacy, education, nutrition, health, employment and most of all, status in society. The adult literacy rate of females in 1992 in the developing countries was only 58 per cent as compared to 79 per cent among males. Mean years of schooling for females was only 3.0 years as compared to 4.9 years for males. In the least developed countries, females had only 0.9 years of schooling while the males studied for 2.2 years on the average.

Practically, in all the developing countries, women are equal partners in economic activities. In the rural areas of some countries, the percentage of female farmers is even higher than the males. But the vast majority of them are still not counted in the labour force. They are discriminated against for positions in the government, judiciary and in politics. It is encouraging to see that during the last decades, the prime ministers of four countries had been women and steps have been taken to give higher representation to women in various fields. But the problem is much bigger. There is the need to change the attitude towards women and raise their status in society. Even within the family, in the traditional societies, the women occupy a secondary place as compared to males - even the minor male children. Needless to say that female education, economic independence or at least earning power, social security and insurance against crimes against women are the minimum conditions for giving women their proper place in society. One should recongise their role in rearing a healthy family, developing mores to build human relationships and creating norms of conserving and protecting the environment. They should be protected against crime, exploitation and abuse and allowed to stand on their feet.

The demographic structure of high population growth countries contains almost half the population in the younger age groups. It will be quite some time before their proportion starts declining as it is linked with the decline in birth rate. Until such time, children and the youth will need heavy investment in health, education, skill development, recreation and strong measures to keep them away from the scourge of drugs, unbridled sex, truancy and delinquency. The governments and the NGOs with the help of other interested groups should develop programmes to promote healthy habits and life styles for the youth and show them the way to a fruitful future.

The poor segments of the population in the developing countries tend to have large families. As a result, many a young member of the family is employed as child labour. This practice is wide-spread in some trades and occupations. Most countries have laws against the practice but they are not followed. Legislative measures may not be able to eradicate the practice easily as it is entrenched in the social and economic system of traditional

societies. Drastic social and administrative action will be required to stop the employment of children through the boycott of the establishments employing child labour. Many industrial countries have been threatening to ban the use of products in which children are used as labour. But hypocritically, they continue to import and promote the use of such products. This duality has to be stopped as it involves the health and welfare of millions of children around the world.

It is generally not realised that high birth rates and declining death rates ultimately result in a large older population. As the life expectancy rises, more people survive and reach a ripe age. These senior citizens in the coming years will be a major burden on national resources. This is the time that steps should be taken to look after this growing segment of the population and provide them sustenance, a useful occupation, recreation, and medical care. The developing societies have still not drifted too far from traditions so they may succeed in encouraging young families to look after their older members.

As an important vehicle of change, the communication system should be expanded to cover more members of society so that new ideas can be spread effectively and widely. The modern world owes much of its success to efficient communications. It will continue to be so in the future.

Sensible decisions about the size of the family and the style of family management are closely related to the development of the social sectors. The emergence of a better informed society will carry the nation to prosperity more easily than a semi-literate population suffering only from illusions and delusions of greatness without doing much about it.

In the final analysis, the ultimate reason for high population growth is poverty. The denial of all economic and social opportunities, poor standing in society, lack of education and health facilities, poor housing, electricity, safe drinking water, sanitation, low status of women, and most important, employment lead to conditions that encourage large families. The birth rates remain high as they off-set high infant mortality. Large families also provide child labour. Illiteracy and the low status of women make it virtually impossible to make a decision regarding the size of a family and how to go about it, which encourages unchecked fertility. Disease, unattended morbidity, unhealthy living conditions lead to a life where the pressure of a large family is not even felt as the senses are dulled by perpetual struggle for existence, and a large family becomes just another fact of life.

The reason why this author considers poverty as the root-cause of population problems is that poor standards of living are the sum total of all the forces in society which deprive the common man of his rights and the basic needs of life. Without philosophising further, one has only to pick up the thread by which poverty is woven and how the class suffering from it can improve its situation - the adoption of the small norm is one of the measures towards that end.

First, let one reaffirm the assertion that population growth and poverty are the basic link in the chain of population and development relationships. In all developing countries of the world, 31 per cent of the population lives in absolute poverty - 37 per cent in the rural areas and 28 per cent in the cities. In the least developed countries, 64 per cent of the people live under the poverty line - 71 per cent in the rural areas and 31 per cent in the urban areas. The crude birth rates (CBR) in these groups are 30 per 1000 for all the developing countries and 44 for the least developed countries. The total children born to a woman (Total Fertility Rate or TFR), in 1992 was 3.8 for all developing countries and 6.1 for the least developed countries. These figures clearly establish the relationship between poverty and high population growth. A study of individual countries establishes this thesis further. The only question that remains to be resolved is whether it is the high population growth which leads to poverty or is it the poverty which encourages or at least licenses high population growth. This is a debate which is not easy to resolve. The safest statement can be that both should be attacked simultaneously. However, the alleviation of poverty argument has an edge, as its adoption would provide at least the beginnings of a decent living for the poor which would automatically lead to low birth rates.

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Link between Higher Education and the Community – a Model

Rukhsana Zia*

Abstract

Higher Education (HE) in Pakistan presents a case of the "inverted pyramid". The need of the country is to eradicate illiteracy and yet on the eve of the new millenium it stands at a humble 45 per cent. Poverty in the country is on the rise. Given the constraint of the financial resources the downward spiral is evident and yet the masses at the grassroots level could greatly benefit from increased literacy skills. Equipping them with functional literacy skills would clearly improve their quality of life. Given the two opposing trends whereby the country needs to provide massive literacy skills to its populace and the infrastructure of education heavily biased in favour of HE, an innovative approach within the education system and its mode of delivery is needed. This paper focuses on one such possibility and proposes a model to develop a link between the two to place the benefits of HE at the doorstep of the populace where it is desperately needed.

Introduction

The idea is not original. Land-Grant higher education (HE) institutions, colleges and universities were established in the USA in 1862, basically to provide education to the members of the working class. It was meant to make HE accessible to the common man with the added benefit of an education that was relevant to their everyday life and to date these HE institutions continue to fulfill their democratic mandate for openness, accessibility, and service to the people (NASULGC 1995 p 4). But these HE institutions had to modify their *modus operandi* with the changing times and changing needs. In the early twentieth century, it was found that the land-grant colleges and universities established for the common man / woman, were finding it increasingly difficult to meet their legislative mandate to disseminate research-based HE information to the general populace / rural residents (O'Neill and Wood 1989 p 38). A better way was sought to bring information to the people who needed it (Waller 1958). When placed in an historical perspective it is easy to see that the USA then was predominantly rural in character. With vast open spaces and scattered population, it was difficult to educate the masses. The arrangement of local programmes from

* The author has a Ph.D. in Education from the University of Wales and is an Associate Professor at the College of Home Economics, Lahore.

distant universities and colleges was a drain on the resources and logistically difficult to manage. In 1914, the Smith-Lever Act was passed in the USA and soon after, the Congress established the Cooperative Extension Service. It was essentially cooperation between the Departments of Agriculture and Home Economics- the two departments of HE institutions- found to be relevant to the needs of the majority of the populace. It was an innovative form of education, one in essence designed to reach the field / the grassroots level. Though the population was largely literate it was still impossible to reach a large number of people through written / printed materials. It was decided then that extension workers of the Cooperation Extension Service be sent to the community to interact with the masses in the field. The fundamental idea was to offer an opportunity for education, related to the practical realities of life, to a larger number of the population. Educational programmes were developed according to the needs that existed at the community level and with time, these evolved with the changes in technology. More importantly, Extension Services acted as a change-agent to prepare people to the latest possible changes and expected challenges. With such a dynamic existence it is only to be expected that the future of agents / workers who coordinate HE and the community will be full of challenges. And as the communication processes and technology become increasingly advanced their challenges will become more daunting and imaginative.

In relating the above to the scenario in most developing countries such as Pakistan, several parallels are immediately evident. On another level though, the discrepancies are also highlighted. Pakistan is a predominantly rural community (66 per cent) with a considerable urban slum. A large segment of the population is illiterate and exists in conditions of extreme depravity. The Human Development Indicators (HDI) are even more pathetic, i.e. 0.383 (UNDP 1996 p 139). The HDI factors in rural areas are lower still, and within these the rural woman is the worst hit and exists in a state of utter neglect (Zia 1998 p 23). When placed in an holistic perspective, it is clear that the need of the time is to provide education and skills to the rural woman whereby she can improve her quality of life and be empowered to take on economic responsibilities. The extension / outreach programme, as it is known in the USA, is poised to offer a variety of information at unconventional hours to unconventional clients in unconventional packages (O'Neill and Wood 1981 p 40). And this is exactly what such a programme has the potential to offer in a country such as Pakistan. It is for this reason that it has been propounded as a model ideally suited to developing nations, i.e. those with limited resources so that they can be propelled to a greater state of self-sufficiency (Belck 1985 p 46).

The Proposed Model

In November 1998, the Department of Social Welfare, Women Development and Bait-ul-Mal Punjab, organised a provincial workshop on "Strategy Planning and National Plan of Action for Women Development". One of the working sub-groups on Education, of which I was also a member, made a recommendation of linking HE institutions to the rural community. At the time it was established Pakistan projected a case of "Inverted pyramid" with a narrow primary education base and a wide HE top (Zia 1994 p 10), when it should have been the other way round. It was also recommended that the expertise of HE institutions, as a structure that was already in place, be utilised for the benefit of the populace. It was proposed that HE be linked to the rural areas (since HE as a service is non-existent in the rural areas)/ community wherever applicable. It was also proposed that the government make this mandatory, as this would ensure that the massive HE infrastructure was not left for the benefit of the privileged few. Another vibrant theme of this workshop was the proposal to establish links between various sectors/departments/ organisations of the country. As a direct result of the above suggestions one such model is proposed for a link between HE and the under-privileged community. This model has the added advantage of emphasising partnership/networking between governmental and non-governmental organisations, in this case, Government College of Home Economics (CHE) Lahore and BUNYAD Literacy Community Council (BLCC), a non-governmental organisation (NGO). A link will be established between these two for the benefit and welfare of the under privileged female (directly) and the community (indirectly), be it in a rural area or an urban slum. Pakistan is an agriculture-based economy. Like other developing / under developed economies of the world, it exhibits traits of high illiteracy, high population growth, malnutrition, migration from rural to urban areas resulting in urban slums, high unemployment rates and so on (UNDP 1996). Constraints of the financial resources demand that these be utilised to the maximum with the minimum of wastage. The national development programmes should focus on the real and personal needs of the urban and rural poor (the majority of the country's population). These translate to need for improved housing, better nutrition, improved food / dietary practices to maximise the usage of available food, and appropriate skills to maximise the potential of agricultural land, and so on. Learning everyday life / practical skills is an essential need for the populace in developing themselves.

Home Economics in Pakistan is a purely female discipline (in other countries of the world the discipline attracts a strong male clientele as well. In most countries of the world the discipline is now named as "Family and

Consumer Sciences". The purpose is to advance the well being of the families focusing on their roles as consumers of goods and services, providers of services and producers of goods. CFCS 1998 p 1-2). The five main subject areas of the discipline in CHE are Food and Nutrition; Clothing and Textiles; Human Development; Housing and Home Management and Related Arts. Apart from the above core areas there are supporting subjects such as physical sciences, languages, economics, statistics, religious studies and computer studies. It is evident that Home Economics is a distinct professional field and basically focuses on imparting knowledge, skills and attitudes that are crucial to improving the quality of life of the individual and the family. It is also worth noting that the success of the market economy is attributable in large part to the existence of a strong non-market institutions such as the family, which has been the primary agent of socialisation and, in conjunction with religion, the primary source of values (Fuchs 1983 pp. 240-241). The author is commenting on the American way of life, but it is applicable to Pakistan as well. Placed in the above perspective, it is clear that the discipline provides human resources and information that are crucial in addressing the social and economic problems of the country. Strategically speaking, linking quality of life and family is a sound and effective social technique and these strategies can help frame quality of life issues in ways that are consistent with many of society's accepted values (CFCS 1998 p 4). Hence, the case for taking Home Economics to the underprivileged community makes sense in light of the fact that what it offers is relevant to the needs of the masses that have limited resources (and within that the most deprived, the female).

BLCC is very active in the province of Punjab. It has the largest number of Literacy Centres. Since its inception in 1992 to date, it has made a tremendous impact in promoting literacy in the rural communities of the Punjab. It has at present over 700 centres in 11 districts. The centres are organised with the help of the community, who contribute in kind by offering space / room / building and utility bills for the centre. The teacher is selected from the community with the minimum qualification of matriculation / or ten years of schooling, and then groomed with continuous in-service training and education. The mode of delivery of education is by the non-formal system. The learners are provided education according to the government curriculum for primary grades and recommended textbooks of the Punjab Textbook Board are used as instruction material.

The operational details regarding the model are outlined in the following paragraphs. The CHE intends to initiate a Community Development Unit (CDU) with the explicit aim of reaching out to the community for an improved quality of life. The access to the community

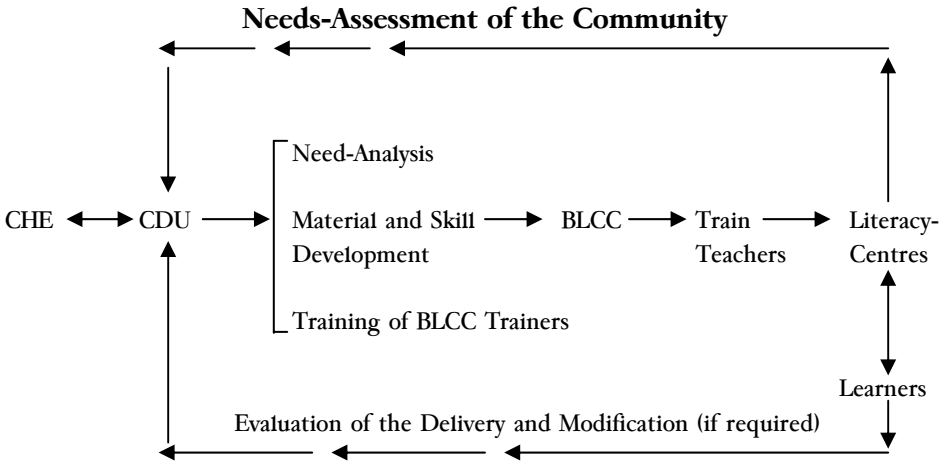
will be managed through the existing infrastructure of BLCC. The following procedures will be initiated to process the model:

- A community will be identified for the project–consideration will be given to the community that has a BLCC literacy centre;
- CHE will formulate effective procedures / research tools for need-assessment of the community;
- Need-assessment will be carried out by the master-trainers / teachers of BLCC literacy centres, who will be trained by the CDU staff to use these tools;
- The results of the survey will be sent to the CDU where it will be collated and analysed by the CDU staff;
- On the basis of the assessed and prioritised needs (of the community), instructional materials and / or skills will be designed and developed;
- The master trainers of BLCC will be trained by the CDU staff to deliver the prepared instructional materials / skills to the teachers of the literacy centres;
- The teachers will deliver the prepared materials and / or developed skills to the learners;
- The programme will be periodically evaluated to monitor and improve its efficacy, impact and effectiveness.

CHE will thus reach out to underprivileged females and families with accurate, research-based information according to the specified needs of the community. This will equip them with knowledge / awareness of possible options open to them. By linking the expertise of CHE with the rural / underprivileged community via BLCC (the vehicle for outreach programme implementation), the establishment of a new infrastructure will be avoided. BLCC with its amazing success story and credibility in the rural / underprivileged areas will be instrumental in fostering strong and beneficial links wherever required and necessary.

The figure below, very simplistically states the networking of the CHE and BLCC to provide appropriate services to the community as per the objectives of the CDU.

Figure-1: Diagrammatic Representation of the Model



This model will be extremely beneficial, and some impact possibilities are stated below:

1. Improved Quality of Life and Poverty Alleviation

The ultimate aim will be to develop a sustainable connection between CHE and the community, an outreach link to anticipate opportunities that will contribute to an improved quality of life and a better future for the deprived communities. Effective strategies will be devised to impart knowledge and skills to the community, so that even within the same resources there will be a tangible improvement in the quality of life of the rural woman and the family. This could be in terms of better health and nutrition; improved hygiene; better childcare; cleaner environment, to name a few. Improvement in skills would lead to increased employment, small-scale enterprise and income generating opportunities for the community. All this will alleviate the poverty and suffering of such families and make the community a better place to live and work.

2. Better Education

It will help develop outreach educational activities between the CHE and poorer communities in the Punjab. Through appropriate mechanisms, educational expertise and resources of the CHE will be transferred to the targeted rural / underprivileged communities. This will provide knowledge, skills and opportunities to the poor to participate in educational programmes in keeping with their identified needs. It is anticipated that educational outreach activities will have many benefits. For example, this will help community groups recognise their assets, identify their opportunities and be better able to devise strategies for their future.

3. Strengthening of the Participating HE Institution and the NGO

The establishment of CDU will strengthen the existing infrastructure of CHE. A sustainable process of faculty development will have to be maintained to keep the CDU operational according to its specified objectives. Research possibilities in the area of community intervention will be endless with a strong focus on its dissemination. The projects undertaken and the ensuing research will be live and real, with immense possibilities for generalisability to similar communities. In addition, CHE and its associated faculties will benefit as an institution through the development of collaborative research, curriculum development, new courses and teaching materials which will be more clearly focused to the needs of Pakistan as a whole. The institution will benefit from management development systems established as part of the new CDU. This will simultaneously strengthen the NGO itself. The teachers will benefit with the training provided, the literacy programme will be more related to the needs of the learners, and programme delivery will be more appropriate and effective.

4. Partnerships between Different Organisations

This model represents a unique and innovative collaboration between the CHE Lahore (an HE institution) and a national NGO working in the Punjab BUNYAD, a case of effective networking between the governmental and non-governmental institutions. At the operational level, CHE will link with BLCC and its partners (other Community Based Organisations) to develop outreach programmes for the implementation of educational activities and materials. This unique relationship will bring together a range of experience and expertise, which will have an impact on the quality of higher education in Pakistan, simultaneously strengthen NGO programme delivery and ultimately improve the lives of women and communities at the field level.

Conclusion

The above stated model offers a highly innovative management approach. It is cognisant with the needs of the developing economy and more importantly, exploits the existing HE structures for the optimal benefit of the country as a whole. It is proposed that this model be seriously considered by all HE institutions as one possibility in response to the structural and procedural changes so urgently demanded by the contextual features of our country.

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Major Determinants of Female Child Labour in Urban Multan (Punjab-Pakistan)

Karamat Ali and Abdul Hamid*

Abstract

In recent years, the sensitive issue of child labour has received world-wide attention and has become the focus of serious discussion in developing as well as developed countries. Any exact information on child labour is usually hard to come by as most of the children work in the unorganised informal sector, which is neither regulated by labour laws nor is monitored by any organisation. These working children are usually illiterate and start working at a very early age, are inexperienced and vulnerable, they usually work long hours in deplorable conditions, have no medical cover, go without sufficient and proper food and clothing, and get little rest and recreation. In this paper, an attempt has been made to analyse the major causes of female child labour in the city of Multan and certain measures and policies have been suggested which could help in bringing an end to this inhumane practice. Legislation against child labour is not an ideal solution in a country such as Pakistan. The child labour phenomena is not as simple as it appears and needs consideration in the context of the microeconomics of the family and population growth and macroeconomics of the social security structure of a country, unemployment, underemployment, opportunity cost and productivity of formal education. There are very few studies on child labour in Pakistan and on female child labour, hardly any study can be found. Data has been collected for 60 female child labourers, employed as maidservants, baby sitters and other household activities etc. Most of these female children work in the houses of educated and well off people who are usually against child labour. This exploitation of child labour cannot be stopped by child labour laws only. In this regard, other measures such as more facilities for education and vocational training are indispensable. A group of social volunteers comprising workers, employers, government officers, media experts, members of non-government organisations and educationists should make earnest and sincere efforts to achieve the objective of minimising child labour and improve their living conditions as much as possible.

* The authors are Professor and Lecturer in the Department of Economics, Bahauddin Zakariya University, Multan, respectively.

I. Introduction

Child labour is one of the serious issues which has been widely discussed recently and is still being discussed in developing as well as in developed countries. Child labour may be defined as full time employment of a person under the age of 16 at a wage rate lower than the existing wage rate in the labour market. Innocent little children, who should be at schools or at play grounds, are on the path of earning their own and their families' livings. Taking advantage of their economic compulsions, the employers hire children, pay them less than what they pay adult workers doing the same job, and they are thus exploited. Most of the children who work are usually employed in the informal sector which is not regulated by labour laws or any organisation. These working children are usually illiterate and start working at a very early age. Lacking education, these children have to work for long hours and they are deprived of even the basic needs such as food, clothing, health facilities and rest or recreation. The majority of them suffer from various respiratory diseases, tuberculosis, anemia, sight blindness, cancer and malnutrition, etc.

Child labour exists all over the world. To collect reliable data about it is very difficult as most of the children work in the unorganised informal sector. According to an International Labour Organisation (ILO) report (1994) about 150 million children between 6 and 14 years work all over the world[1]. According to another ILO report (1993) on the average 18 per cent of the total number of children in the world are engaged in child labour. Their region wise break up is 7 per cent working in Latin America, 18 per cent in Asia and 25 per cent in Africa[2]. A report entitled "The State of Working America 1992-93" stated that nearly 5.5 million children work in the U.S. Some 676,000 children work in the underground economy over which the government has little or no control. In 1990 job related deaths and casualties among these children numbered 139 and 71,660 respectively[3].

The child labour problem is more serious in developing countries and especially in Pakistan. According to the 1981 Census, the child population (5-14) in Pakistan is about 30 per cent of the total population, of which 40 per cent consists of child labour[4]. The ILO report (1990) mentioned some very disturbing facts relating to the carpet weaving child

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[1] "Why do children work?" Young World, The Daily *Dawn* Karachi, June 30, 1994.
[2] The Daily *Dawn* Karachi, April 22, 1993.
[3] "Child Labour in America": The Daily *Dawn* Karachi, September 19, 1992.
[4] *Statistical Pocket Book of Pakistan*, 1991: Statistics Divisions, Government of Pakistan, March, 1991.

labour of Pakistan. According to the report, half of the 50,000 bonded children in the carpet industries died before reaching the age of 12[5].

Legislation against child labour is not an ideal solution in a country such as Pakistan. The child labour phenomena is not as simple as it appears and needs consideration in the context of the microeconomics of family and population growth and macroeconomics of the social security structure of a country, unemployment, underemployment, opportunity cost and productivity of formal education.

In this paper an attempt has been made to analyse the major causes of female child labour in the city of Multan and certain measures and policies have been suggested to hamper this inhumane practice. The layout of the study is as follows: literature of child labour has been reviewed in section II, section III consists of methodology, data description and hypothesis. Results and findings based on the survey[6] conducted in Multan city have been discussed in section IV and finally, policy implications and conclusions are presented in section V.

II. Review of Literature

Child labour has been a problem in both developing and developed countries. According to an ILO report (1993), child labour is 18 per cent of all the children in the world[2]. The problem is more serious in developing countries which suffer from over population, unemployment, illiteracy and wide spread poverty. These are the major causes of child labour. According to BBC television, over 55 million children work in India[7].

M. Weiner and Omar Noman (1994) analysed child labour and education policies in India and Pakistan. According to their analysis, India and Pakistan have fallen behind the rest of Asian countries due to their wrong policies and not because of their poverty. There is widespread illiteracy and child labour in these countries. Education, especially in Pakistan, has secondary importance. It remains near the bottom among the countries of the world in respect of social indicators of development. Amongst 150 nations, Pakistan ranks 130th as regards the proportion of children attending school to the children of school going age, 120 in literacy rate, and 118 in per capita expenditure on health. In other words, there is a wide gulf between Pakistan's economic growth and social development performance. Half of Pakistan's children between ages 5 and

[5] For further detail see the Daily *Dawn* Karachi "Without Child Labour", June, 1990.
[6] Survey conducted by Dr. Karamat Ali, et.al. for the female child labour in Multan city, for the year 1993.
[7] BBC, World Business News, Telecast on April 1, 1994 at 13.25 hours GMT.

9 do not attend school. In rural areas only 17 per cent of girls and 43 per cent of boys complete five years of education. The overall primary and secondary enrollment rate is only 29 per cent. According to the 1981 Census, instead of attending schools, most of the children join the labour force and work in fields and in thousands of small workshops producing all types of goods including garments, carpets, sporting goods, leather goods, footwear, etc.

Pakistan's labour participation rate for male children is higher than many other developing countries which are at the same level of development. According to the 1981 Census, 35 per cent of male children in the 10 to 14 years age group worked. This implies that the total volume of male child labour in Pakistan is over 10 million. This figure is four times the size of Singapore's total population, twice that of Norway's and equal to the entire Greek population. As far as female child labour is concerned, most of them are confined to domestic help and in household enterprises. So accurate data about female child labour is hardly available. However, according to a 1981 Census estimation, the female child labour participation rate is about 5 per cent.

According to M. Weiner, and Omar Noman (1994), about 82 million children in India did not attend schools. That many of these children were engaged in labour, was difficult to find out because a large number of them were doing unpaid work in fields or in cottage industries, beside their parents and were not reported in the Census. A large number of children work in cottage industries, producing carpets, matches, firecrackers, brasswear, hand loomed clothes, baskets, bangles and other traditional handicrafts. Given the uncertainties, it is no wonder that estimates of child labour vary so greatly in India. According to the 1981 Census of India, 13.6 million children were at work, of which 8.1 million were male and 5.5 million female. Of these, 11.6 million were in agricultural work. Other studies showed the number of child workers higher. According to the Official National Sample Survey of 1983, child labourers were 17.4 million.

Weiner suggested four themes in his study to solve the child labour problem. According to his study, the adoption of a compulsory primary education policy was often an established practice in all the developed nations before they began rapid economic growth. Second, the establishment of compulsory education was essential for the elimination of child labour. In the absence of universal and compulsory schooling, children enter the labour force at the behest of their parents. It is easier to force parents to send their children to schools than to force employers not to hire children. Thirdly, people should be made aware of the importance of

education and skills. An educated worker should be given more incentives and wages. People should know that child labour is not simply the result of poverty, it is also one of its principal causes. The fourth theme is that in all economically developed and rapidly growing countries, education is not regarded merely as a right, but as an obligation. No matter how poor the children may be, governments believe that employers should not employ children and parents should see to it that their children do not leave school before completing their studies. So governments should provide adequate facilities for schooling even in remote areas.

Akmal Hussain (1988), conducted a survey on child labour in Lahore and estimated that about 14 million children between 5 to 15 years of age work in Pakistan.

A report on the "Situation of Child Labour in Pakistan" (1998)[8] suggested that 23 per cent of the rural children work, while in cities only 10 per cent children are at work. The report found that these child labourers work for long hours without any rest and proper food. Their wages are very low and they are badly exploited, especially child labour in the carpet industry who are more vulnerable and miserable.

Akmal Hussain (1988) analysed the relationship between poverty and child labour. According to the study, about 40,000 children die everyday due to malnutrition in poor developing countries. He found out that children work for longer hours, than is the usual practice for other labour, i.e. 54 to 72 hours in a week for a pittance of US $ 5 per month. According to his findings poverty is the major cause of malnutrition and child labour in developing countries.

Raja Chand (1983) studied 50 children in various auto workshops and found that 72 per cent of the children who left schools did so either due to poverty, or lack of interest or teacher's harsh attitude. Most of them work for 9 to 10 hours a day and belong to illiterate families.

A UNICEF report (1990) on child labour in the carpet weaving industry in Punjab found that more than 80 per cent of carpet weavers in Punjab were children below the age of 15. The majority of them have to work about 10 to 12 hours a day at a wage of Rs. 200/- to 500/- per month. Most of them suffer from fatal diseases as working conditions and the atmosphere are very poor. Half of them never went to school and the rest have dropped out due to their disinterest in studies.

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[8] Convention on the Rights of the Child, Islamabad, UNICEF Publication, Printed at Pictorial Printers, Islamabad, (1990).

Shaheen Khan (1982) conducted a survey of 100 children working in different trades in Lahore, Gujranwala and Sialkot and found that the major causes of child labour were poverty, family tradition, fight for survival, disillusionment with schooling and lack of any other choice. She found that the average age of these working children was 11 years and they had to provide for their families' day-to-day needs.

Another study done by Sabeeha Hafeez (1988) for Karachi and villages near Karachi found two main causes of child labour–first, poverty and second, parental authority. These children usually belong to very poor and illiterate families. The life expectancy is very low for the adult members of these families and they consider children a major source of their income. They compel their children to work. Referring to the problem of child labour in villages, she says that children are not only exploited by parents but parents have full control over the destiny of their children. Referring to education as an alternative to work, she says that for this parents have to be convinced that education can deliver good opportunities for them and for their children.

Sabeeha Hafeez (1979) made an analysis of child labour in a village of Sindh and found that most of the children who had to share their father's work did not go to school due to work, poverty in their families, and lack of educational facilities. As regards girls, 53.7 per cent of those above the age of 5 when not attending school were found engaged in household chores. The girls are confined by the restraints and demands of the role their society expects them to play. They cannot exceed the prescribed limits outlined by their society. A girl who willingly takes upon herself the burden of household chores and tries her best to unburden her mother is considered to be a loving and virtuous daughter. The regular increase in the number of children in a family entails additional work for elder children, especially for the girls.

M. Anwar and M. Naeem (1986) analysed the child labour situation in rural Punjab and found that working conditions were inimical for children. Most of them do not go to school and suffer malnutrition, poor health and fatal diseases. The children have to perform inadequate services to meet their and their families' basic needs.

From the literature review it is clear that there are very few studies on child labour in Pakistan and on female child labour, scarcely any study can be found. We have attempted to carry out a study of the major determinants of female child labour in Multan city and to propose such measures and policies which in our view could prove effective, relevant and fruitful throughout the country.

III. Hypothesis, Methodology and Data Description

There has been a rapid increase in male as well female child labour. An analysis of major causes of female child labour in Multan city is undertaken. The following may be the major determinants of female child labour.

- Poverty: Most of the child labourers belong to poor families.
- Parents' Education: Parents of female child labour are usually illiterate and unskilled.
- Family Tradition: Father works as blue-collar worker while mother as labourer in others peoples' houses.
- Family Size: Family size of female child labour is large.
- Increased Educational Expenditure and limited schooling facilities.
- Low Wage Rates of female child labour.

Another hypothesis is that educated and rich businessmen who usually profess to be against child labour are the major employers of children (very profitable owing to nominal wages paid to children and their long working hours).

In the specification form, the above causes may be written as:

$$CL = f[P, PE, FT, FS, EE, W] + ei$$

Where CL = supply of female child labour.

P = Poverty (measured by family's income)

PE = Parents' Education.

FT = Family Tradition.

FS = Family Size.

EE = Educational Expenditure.

W = Wages of adult labour.

Ei = Error term.

Data has been collected for a random sample of 60 for female children in Multan city doing household chores i.e. cleaning, washing ironing, cooking, child care, etc. as paid maid servants in other people's houses of middle class families. The survey includes details about their daily routines, monthly income, family income, parents' education, working conditions, family size, number of working hours for the year 1993. A discussion of survey results is presented in Section-IV.

IV. Discussion of Results and Findings

Poverty breeds scarcity and misery. One of the important determinants of female child labour is family's poor economic conditions. Children, whether they are male or female, have to work to fulfill their families' day-to-day needs. The hypothesis that poverty and low family income is a major cause of female child labour is supported by survey results given in Tables-1 and 2. Table-1 gives the data on the income of the father.

Table-1: Distribution of Female Child Labour According to the Monthly Income of Father

No.	Monthly Income (Rs.)	Frequency	Percentage
1.	100-400	05	08.34
2.	500-1000	28	46.67
3.	1100-1500	04	06.67
4.	1600-2000	06	10.00
5.	2100-2500	--	--
6.	2600-3000	02	03.34
7.	6000	01	01.67
8.	4 mon wheat	01	01.67
9.	Casual labour	01	01.67
10.	Nothing	12	20.00
Total	----	60	100.00

A large proportion (55.01 per cent) of the fathers of female child workers earn Rs. 1000/- or less per month. The income of the fathers of 20 per cent of the surveyed female child labour is nil.

Table-2: Distribution of Female Child Labour According to the Monthly Income of Mother

No.	Monthly Income (Rs.)	Frequency	Percentage
1.	100-200	08	13.34
2.	300-400	07	11.67
3.	500-600	08	13.34
4.	700-800	05	08.34
5.	900-1000	03	05.00
6.	Monthly Ration	01	01.67
7.	Nothing	27	45.00
8.	Death	01	01.67
Total	----	60	100.00

Table-2 provides information about female child labourers' mothers' monthly income. This distribution follows the same pattern given in Table-1. Forty five percent of the total female child labourers' mothers' monthly income is zero. About 95 per cent female child labour is such whose mothers have monthly income of Rs. 1,000/- or less. That is the very reason why children in such families are compelled to work with their parents to provide food, clothing, housing and other basic needs to their large sized families. Children are considered a major source of income and are kept away from schooling (especially female children).

Uneducated or poorly educated parents are another cause of female child labour. There is an inverse relationship between parents' education and the supply of female child labour. Educated parents are aware of the worth of educating their children. Illiterate parents consider that sending their children to school is very costly and just a wastage of money and time as they take into account the running cost and opportunity cost of educating their children, and especially female children. Fear of unemployment also discourages them from sending their children to school or keeping them there to complete their education. The fact that a large number of educated young people fail to find any employment, reinforces this fear of unemployment. Survey data shows that parents of most of female child labourers were illiterate or very poorly educated. Tables-3 and 4 provide information about parents' education level.

Table-3: Distribution of Female Child Labour According to Education of Father

No.	Father's Education	Frequency	Percentage
1.	Illiterate	51	85.00
2.	Primary	08	13.33
3.	Matric	01	01.67
Total	----	60	100.00

Table-4: Distribution of Female Child Labour According to Educational Level of Mother

No.	Mother's Education	Frequency	Percentage
1.	Illiterate	56	93.33
2.	Quran Majeed	04	06.67
Total	----	60	100.00

From the information given in Tables-3 and 4, it is clear that most of the parents of female child labour are illiterate. From among 60 fathers of the female child workers, 51 fathers are illiterate, which is 85 per cent of the total. Eight of the fathers of female child workers cleared primary school. The father of only one female child worker had done his matriculation. As far as mother's education is concerned, 94 per cent of the total surveyed females' mothers were illiterate and the remaining were those who could just recite the Holy Quran. Parents' education determine the child's education. Most of the surveyed female children were found to be either completely illiterate or nominally educated. These children started working at an early age and could not find an opportunity to attend school. Information about the ages of the female child worker at the time of their first employment and about their education is presented in Tables-5 and 6.

Table-5: Distribution of Female Child Labour According to Starting Age of Work.

No.	Starting work age (years)	Frequency	Percentage
1.	04	03	05.00
2.	05	12	20.00
3.	06	12	20.00
4.	07	08	13.34
5.	08	10	16.67
6.	09	05	08.34
7.	10	06	10.00
8.	11	02	03.34
9.	12	02	03.34
Total	----	60	100.00

Table-6: Distribution of Female Child Labour According to Their Educational level

No.	Educational level	Frequency	Percentage
1.	Illiterate	32	53.34
2.	Reciting Quran	11	18.34
3.	Completed Quran	02	03.34
4.	Primary	08	13.34
5.	Quran + Primary	07	11.67
Total	----	60	100.00

Most of the surveyed female child labour started working at a very early age. About 75 per cent of the total surveyed female children started working between four to eight years. Due to the work load at this early age, they were unable to attend school or learn any skill. The majority of them were found illiterate. Table-6 shows that female child labourers who were illiterate were 32 out of 60, which was 53.34 per cent of the total. Those who could just recite the Quran were about 22 per cent. Their being illiterate and unskilled makes them vulnerable and turns them into helpless beings very easy to be targeted and preyed upon throughout their lives. After them their children must suffer the same fate and thus a vicious circle of child labour persists. That is why family tradition is another major determinant of female child labour. The fathers of most of the surveyed female children were working in blue-collar jobs, their mothers had either worked as child labour or were still doing such work. Information about the mother's job is given in Table-7.

Table-7: Distribution of Female Child Labour According to the Job of the Mother

No.	Mother's Job	Frequency	Percentage
1.	Cleaning + washing	22	36.67
2.	House wife	28	46.67
3.	Farming	05	08.34
4.	Seasonal worker	02	03.34
5.	Weaving carpets	02	03.34
6.	Mid wife	01	01.67
Total	----	60	100.00

Large family size is considered another major cause of child labour. Most poor families have 5 to 6 children on average. The incomes of these families are too low to fulfill even such basic needs as food and clothing. As a consequence, elder children have to share the burden of living. Innocent little hands serve others or weave carpets instead of studying or playing. Surveyed data about the number of sisters and brothers is given in Tables-8 and 9.

Table-8: Distribution of Female Child Labour According to the Number of Sisters

No.	No. of sisters	Frequency	Percentage
1.	One sister	08	13.34
2.	Two sisters	09	15.00
3.	Three sisters	10	16.67
4.	Four sisters	07	11.67
5.	Five sisters	06	10.00
6.	Six sisters	06	10.00
7.	Seven sisters	03	05.00
8.	Eight sisters	04	06.67
9.	Nine sisters	--	--
10.	Ten sisters	03	05.00
11.	Eleven sisters	01	01.67
12.	No sisters	03	05.00
Total	----	60	100.00

From Tables-8 and 9, it is clear that most of female child labourers belong to large size families. About 65 per cent female child labourers have sisters of ages ranging from 2 to 6 years (Table-8) and about 75 per cent have two to five brothers.

Table-9: Distribution of Female Child Labour According to the Number of Brothers

No.	No. of Brothers	Frequency	Percentage
1.	One brother	12	20.00
2.	Two brothers	20	33.34
3.	Three brothers	15	25.00
4.	Four brothers	05	08.34
5.	Five brothers	05	08.34
6.	No brothers	03	05.00
Total	----	60	100.00

Most of the surveyed female child labourers were those who either do not have any or have only one working brother. Table-10 gives the information about the number of brothers of surveyed female child labour, who work.

Table-10: Distribution of Female Child Labour According to the Number of Working Brothers

No.	No. of working brothers	Frequency	Percentage
1.	One brother	13	21.67
2.	Two brothers	08	13.34
3.	Three brothers	05	08.34
4.	Four brothers	02	03.34
5.	No brother	32	53.34
Total	----	60	100.00

It is clear that about 75 per cent of the surveyed female child labourers either do not have any or only one working brother.

With the increase in the number of brothers who work, the number of female working children decreases. One of the major causes of female child labour, as of the male child labour, is the rapid increase in wage rates

of adults and comparatively very normal wages paid to children for the same work. Generally, the daily wages of a child range from Rs. 10/- to Rs. 60/-. The weekly income ranges from Rs. 50/- to Rs. 130/-. The monthly income of a child ranges from Rs. 100/- to Rs. 800/- (Sabeeha; 1979). Findings about the monthly income of female child labour are presented in Table-11. The majority of the working female children were paid upto Rs. 300/- per month for 6 to 12 hours work per day. Twenty three per cent children work long hours doing all types of odd jobs with the promise that they will be paid at the time of marriage in the form of a dowry. This is actually a very shrewd and callous tactic to avoid payment. Employing female child labour on the promise of paying them in the form of a dowry, the scheming employers try their best to delay marriage for as long as possible even for those girls who wish to get married. The health of these working children were found unsatisfactory as they had only one or two holidays per month, worked long hours in unhygienic conditions and suffered from malnutrition. Another hypothesis tested in the study is that educated and rich people who publicly raise slogans against child labour, are the major

Table-11: Distribution of Female Child Labour According to Monthly Payments

No.	Education	Rs. Per month Frequency	Percentage
1.	100	05	08.34
2.	150	02	03.34
3.	200	16	26.67
4.	250	02	03.34
5.	300	10	16.67
6.	350	01	01.67
7.	400	03	05.00
8.	500	04	06.67
9.	Dowry	14	23.34
10.	Rs. 200 for dowry	03	05.00
Total	----	60	100.00

employers of female as well as of male child labour. They habitually exploit child labour, paying the children very low wages. Information about this is presented in Table-12. Most employers of these surveyed female working children are educated and well off people. Although these employers themselves include highly paid salaried people, successful businessmen, traders etc. they pay the children very low wages. The survey shows that

about 32 per cent of the employers are arts or science graduates, about 34 per cent hold master's degrees or some equivalent professional degree. About 70 per cent of the female child labour were employed by businessmen and landlords and the remaining were employed by doctors, engineers, professors, etc.

Table-12: Distribution of Female Child Labour According to Education of Head of the Family where she is working

No.	Education	Frequency	Percentage
1.	Matric	08	13.33
2.	F.A., F.Sc.	13	21.67
3.	B.A., B.Sc.	19	31.67
4.	M.A., M.Sc.	07	11.67
5.	M.B.A.	01	01.67
6.	B.Sc. Engineering	01	01.67
7.	M.B.B.S.	09	15.00
8.	D.H.M.S.	02	03.34
Total	----	60	100.00

Table-13: Distribution of Female Child Labour According to Education of Head of the Household where she is working

No.	Occupation	Frequency	Percentage
1.	Landlord	19	31.67
2.	Businessmen	22	36.67
3.	Doctor	09	15.00
4.	Engineer	02	03.34
5.	Bank Officer	01	01.67
6.	Govt. Service	02	03.34
7.	Professor	03	05.00
8.	Homeo Doctor	02	03.34
Total	----	60	100.00

V. Conclusion and Policy Implications

As has already been stated, child labour has become a serious problem. There is a great hue and cry in developed countries against child labour in developing countries. Children are not allowed by law to work. But despite this, widespread child labour is a fact of life in the developed and developing countries. The reason for increasing child labour is that it is not as simple a phenomenon as it appears to be and requires a comprehensive consideration of family as well as of socio-economic conditions in developing countries, which are the causes behind ever increasing child labour. The analysis made in this paper suggests and discusses the major causes of female as well as male child labour. It is the unbearable economic pressure exerted on the parents that makes them push their children to work. The children have no choice except to submit to their parents' authority. They are compelled to share the economic burden of their large families.

Education is the best antidote against child labour. But both parents and children must be convinced that education can solve their problems and is to their advantage. Firstly, governments and international institutions such as the ILO should take effective measures to provide free education and training to these working children. Free and easy access to education may have an effective impact in reducing child labour. There is a very strong bias against female children becoming educated in vocational training as it is regarded as some unheard of abomination. Such attitudes must be tackled head on and eliminated. With the addition of another child at regular intervals, the elder children are burdened with added workload and new responsibilities.

The child labour problem needs to be considered as a part of manpower planning. There should be compromises concerning the application of the child labour prohibition law. Child labour must be prohibited in certain industries where the atmosphere and conditions are inimical to children and should be amended and made adequately flexible to allow the children to work in certain fields in a poverty-ridden society such as Pakistan. The exploitation of child labour should be curbed. For an equitable and adequate implementation of labour laws in poor developing countries such as Pakistan, a group of social volunteers comprising workers, employers, government officers, media experts, members of non-government organisations and educationists, etc., should make earnest and sincere efforts to achieve the objective of minimising the miseries of child labour in order to improve the children's quality of life as much as possible.

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Female Under-representation in Educational Management

Saeeda Shah*

The obvious fact of female under-representation in educational management across cultures and nations is mentioned in every relevant study. Interestingly this phenomenon transcends the dichotomies such as developed/under-developed, Eastern/Western, Muslim/non-Muslim, First/ Third World countries. Variations are more often due to situational differences. For example, the percentage of female representation in higher education management for the U.S., Britain and China as given by Lyn Davies is respectively 24, 13, and 26 per cent (1992-6; Also see Coleman: 1996), 20-30 per cent in Pakistan (Ibid:4). These statistics could be misleading for generalisation purposes if it is assumed that a higher percentage means more educated women or less gender discrimination. We know that a comparatively higher percentage of women managers in Pakistan is because of 'women only' institutions. In the contexts where management jobs are open to men and women, women are in extremely low numbers, and the situation is not very different in other countries.

This paper examines the socio-cultural barriers to female participation in management - in positions of power and authority. There is no denying the existence of structural and professional deterrents for aspiring and ambitious women, but the argument is that no laws can enforce equality and social justice unless equality is socially acknowledged and practised. The significance of how gender is conceived, perceived and culturally represented cannot be ignored in perpetuating structures in spite of all efforts towards resistance (Skeggs:1991).

An Overview

Over time and across cultures

In diverse societies and cultures such as the U.S. (Ozga: 1994), India (Nayyer: 1985), New Zealand (Strachen: 1993), Britain (Wilson: 1995; Wilson: 1997), and many Third World countries (Davies: 1992), different social, organisational, structural, economic and political factors act at different levels as barriers to female participation in management. But common to all societies seems to be an implicit belief that male/female differences compulsively imply female inferiority. It is the socio-historical

* Dr. Saeeda Shah has a Ph.D. in education from the UK. She is currently the Dean, College of Home-Economics, Mirpur, Azad Kashmir.

development of the sex-roles and image of women, and its dissemination through different channels throughout human history that lies behind today's marginalised, less motivated, less ambitious, low aspirant woman (Balkin: 1987; Dealmont: 1980).

Interestingly, religions (Islam, Christianity, as well as Hinduism and many others) have also been manipulated to perpetuate female marginalisation and suppression. Delving into that debate is beyond the scope of this brief paper, but one point worth making is that Islam does not perceive one sex superior to the other any more than one person or one race or one tribe from the other, except for their *taqwa*. The Quran clearly states:

> "O mankind, we have created you male and female, and have made you races and tribes, that you may know one another" (49:13).

And the stance adopted by the Muslim women scholars (Ahmed: 1992; Al-Hibri: 1982; Al-Saadawi: 1982; Hussain: 1984; Mernissi: 1991; 1993), and as often supported by non-Muslim women writers (Schimmel: 1978, 1982; Waddy: 1980; Stowasser: 1994), is that Islam and the Quran do not establish any inherent spiritual, intellectual, or physical inferiority of women. Even scholars such as Maulana Maududi who have certain reservations and argue that the female "sphere of activity is the home" (1979:152), recognise women's physical and mental equality and acquisition of knowledge (1979:113-122; also 1995).

However, 'his/story' has presented woman as weak, fallible and inferior, responsible for the fall of Adam from day one. In theology, the first woman is presented as a weak counterpart, who succumbed to Satan's persuasions and caused Adam's expulsion from Eden. This ignores explicit Quranic statements such as "Satan made them both slip from the Garden and so deprived them of their previous felicity" (the Quran:2:36-37, also see Badawi: 1994). And pragmatically, Adam's rushing into a faulty and hasty judgment reflects rather negatively on male decision making -a vital function in management.

Historically, women have been socialised into secondary positions and subordination. The technologies (Foucault: 1977) have at times been social norms, cultural patterns, code of behaviour or even law. In the Greek city states, the first upholders of democracy and human rights, women had no right to vote, which was a negation of their existence as individuals and citizens. Romans, with all their ground set of laws, treated women as merely decorative, bestowing all power to the male head of the family (Massey:

1988). Aristotle claimed that 'women are physically, mentally and socially inferior to men'. Certain Arab tribes of the early 7th century (pre-Islam) buried their daughters alive at birth. In today's India, Pakistan and Bangladesh, in families of particular socio-economic backgrounds, sympathies are offered at the birth of a female child to the 'unhappy family'. The miserable mother is blamed for bringing the unwanted child into the world and if the number of female offspring increases with no male child to brighten the house, the unlucky mother can be divorced. If economic constraints force a choice, the female child will be the one chosen to not receive an education (Shah: 1986). These attitudes marginalise female children from a very early and impressionistic age.

This socio-historical specification of sex-roles is further emphasised through folk-lore, literature, curricula and the media. Women in Greek literature are there to please, to obey, and to serve. Women in Homer's Odysseus are exchanged, given as prizes, stolen, sold as slaves (Paradotto and Sullivan: 1984). In the later literature, European or Oriental, the favourite female type is the gentle, caring, undemanding woman, quick to serve, willing to obey, and ready to sacrifice. Ibsen's woman becomes controversial by trying to manage the situation herself (The Doll's House). She invites criticism and opposition, becomes an out-cast, and 'the doll's house' crumbles. Perhaps many women suppress their job ambitions or restrict their professional participation to save their 'dolls houses' and this applies to diverse societies.

Barriers or 'Technologies' of Marginalisation

Acknowledging barriers to the female struggle for equal participation can help the move from the margins to the centre. Gathered from an in-depth review of international literature, there emerge three major sets of assumptions leading to female under-representation in educational management and leadership positions:

- Sex-roles: including career mapping, attitude to promotion, female sex-roles, role discrimination, etc.

- Organisational constraints: sexual division of labour inside the institutions, discrimination in promotion, concepts of leadership, etc.

- Power relations within society: networking, role models, etc.

Women and men are different but this difference does not imply a superior/inferior relationship. Strategies need to be developed to take women out of this socio-psychological suppression. Within the sexes

individuals can outperform in certain areas if they are rightly motivated and developed. The wide spread undervaluation of women's work on the part of governments, planners, academics and others (Brydon and Chant: 1989), their invisibility from planning and decision making (Davies: 1992), a general scarcity of role models/mentors, and hindrances in networking are some major obstacles in changing women's attitude towards opting for management responsibilities.

The sex-roles, stereotyping and career-mapping of women emerge as strong barriers to female entry into positions which have traditionally been associated with men, particularly in management positions (Davies:1987; Evetts: 1994; Ozga: 1994; Kelleyand Elliot: 1982; Sakeshaft: 1991; 1993). Role-socialisation of women (Shakeshaft: 1991; Hall: 1993), reinforced by male cultural domination and the tendency of putting more value on male tasks (Shakeshaft: 1991:94) subjects women to a pre-determined devaluation of their contribution to work. Many women scholars have critiqued these attitudes. Al-Khalifa mentions theories of overt and covert discrimination (1992:101; Also Adler et. al. 1993:25; and Ozga: 1994:38) as barriers to management positions. She notes that the association of masculinity, male authority and school leadership is pervasive in the life of the school and argues that educational management is seen as demanding male skills. What Hall calls the 'traditionally gendered organisational roles' (1994:3), and Evetts defines as 'the gendering of careers' (1994:7), is a phenomenon acknowledged by any study of leadership which includes gender. Al-Khalifa discerns an association between theories of organisational leadership and masculinity which deter women from identifying with the role of manager. She emphasises that alternative models of career need to be accompanied by a reconceptualisation of management to include women's experiences and interpretation (1992; also Hall: 1993:30,35). Shakeshaft considers the theories of organisational constraints leading to a lack of role models and networks for women, stereotyping, and male dominated selection committees (1991:67). Marianne Coleman adds to the debate through theories of inequality, referring also to male domination of research methods and management theory as another explanation of female under-representation in educational management (1994:187-8).

Davies (1992) maintains that many factors considered as barriers in developed societies are not barriers in the Third World, which indicates a variety of contexts. In certain contexts, women's career mapping appears to be effected by motherhood issues and responsibilities of looking after a family. Men in management have helpful partners to look after the family,while women by entering into management posts add to their responsibilities and work-load. Many women leave work during child-rearing

or because of other family responsibilities (Ozga: 1994; Riches: 1990; Shakeshaft; 1991; 1993), and a later re-entry into a job may decrease motivation and the opportunity to progress. Marshall comments on the stress to manage their multiple roles and hints meaningfully that "the real problems started after maternity leave" (1984:188). However, women in Pakistan, India, Bangladesh, Sri Lanka and may be in many other Third World countries, which have joint family systems or different social structures, and where severe climatic conditions restrict work-hours, women may not have to leave work to rear children. But there is certainly a greater increase in work-load for the women who are, for reasons, unable to get help from inside the family, or cannot hire domestic help, leading to complaints about accommodating/combining home duties and job responsibilities (Raj: 1982). Although child rearing and family duties do not emerge as a very strong barrier in the Third World context as compared to its significance in developed societies, the issue of work-load in the case of demanding jobs such as institutional headship cannot be ignored as a serious barrier.

Another explanation of female under-representation in management is perceived to be female role-socialisation on the 'domestic' site. In the family, the female child is socialised into stereotypical femininity : to be timid, obedient, silent and soft. Interestingly, none of these qualities is associated with attributes of managers or leaders in the main stream definitions evolving from male experience. Davies (1992) explains over-representation of men in management as resulting from the male assumption of administrative/management tasks and their 'over-competitive' attitude. She finds that females need to be persuaded to take management responsibilities and constantly examine their leadership abilities. Women emerge as competent as men in many research studies (Shakeshaft: 1991; Davies: 1992), and their opting to stay out of management jobs to some extent is explained by maintaining that they wrongly presume 'the universality of male experience' (Shakeshaft: 1991).

In a situation such as Pakistan where there is a separate area of female management at the college level, women still avoid taking up higher management jobs in mixed-sex settings. Brydon and Chant (1989) offer another argument that "the cultural norms are so strong that women effectively opt out of visibility by going into stricter *purdah*". This *purdah* is not necessarily a veil, but a symbolic attitude opting for invisibility and avoiding the 'gaze' (Foucault: 1977). Such behavioural norms can be one explanation of what Nayyar (1985) refers to as 'disabilities of their sex roles'. Although Davies (1992:19) refuses to accept sex role as disabling, but the analysis by her seems to accept sex roles as a restricting imposition.

Davies (1992) argues that women "underplay" themselves and this is supported by other studies. Different managers in Shakeshaft (1991) describe women as tentative, better listeners, avoid questions, less assertive, convey signals of courtesy, and more inclusive rather than exclusive (See also Shah: 1998). They are generally regarded as less ambitious, lacking in confidence, over emotional, too family-centred or under-achieving (Davies: 1987), which again points to the cultural norms against which women are judged and are also expected to perform.

Another barrier is that in our male-dominated societies, men find it hard to accept women in positions of authority even in a professional context, which suggests home-to-job transferring of role relationships. Male dominance in the domestic setting is replayed in the 'public'. Al-Khalifa quotes a male teacher saying: "It grates me to have a woman in a position of authority over me" arguing that "rejection of women's leadership .... [is] ... a standpoint shared by many men" (1992:101). Aspiring women do not have to fight only against structural barriers but also social patterns and cultural norms.

In a sex-segregated education system, women managers are accepted as a necessity, but the feeling of rejection persists. The practices are accommodated by shifting and patterning organisations within the discourse of the 'family' where women manage like mothers in the family setting, but with little control over policy or resources. This suits patriarchal traditions. Unless the role relationships in the family change or the role relationships in the organisations are conceived as different from those within the family, the rejection of women's leadership by men will continue, particularly in religious societies structured on patriarchal/feudal patterns.

The odds against which a woman performs and the courage, strength and tolerance that she brings to her work needs to be recognised and appreciated, and this emphasises the importance of net-working. Davies considers networking as an important factor towards promotions and considers it one of the reasons of males' over-representation in educational management. Similarly, role-models/mentors serve as positive incentives. She recommends women-only training courses which "provide space for women to articulate, to experiment, to feel unthreatened and not to have to play power games" (1992:109; also Al-Khalifa: 1992). Nevertheless, she does not exclude mixed sex courses, as these represent the reality of the work situation.

Epilogue

Davies (1992) claims that men 'assume managerial tasks' because they are 'confident', but she does not go into those cultural norms and socio-psychological suppressions of women which socialise men to be 'confident' and women to submit to secondary positions. When and where these cultural norms do not function very strongly, and socio-psychological suppression is countered by strong and encouraging role models/mentors and networking, women compete with confidence for highly responsible management positions; and in Islam we have many examples of such women from its very early history (Shah: 1998). This should motivate and inspire Muslim women to aim and strive for equality in all situations.

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What use is the Neo-Classical Theory of International Trade?

Sikander Rahim

International economic policy is now more under the sway of orthodox economics than it has ever been. The main international economic institutions, the IMF, the World Bank, the WTO, and the major developed economies are unremitting advocates of free trade and impose their views on the developing countries. And the developing countries, whose attempts at economic development through protection have mostly failed, are on the whole inclined to accept these views. Over the last twenty years economic policy in these countries has more and more come to be formulated by orthodox neo-classical economists, often described in the press as "reformers", who advocate more reliance on markets and less protection against imports.

Yet economic performance around the world has not been better over the last twenty years than it was in the earlier period of the 1950s, -60s and –70s. On the contrary, it has mostly been worse, the main exceptions being a few East Asian economies, including China, that have not on the whole been notable for the freedom of their markets or external trade, and, over the last ten years, the US. Economic growth rates of the world as a whole in the later period have been well below the rates of the earlier period. Income inequalities within countries have increased almost everywhere, except in the East Asian economies mentioned and possibly a few West European economies with large social protection systems. In Latin America, where liberalisation has been pursued with the most earnest, the bulk of the population appears to be worse off than it was twenty years ago. Unemployment rates seem to have increased in most countries, except the successful East Asian economies and the US, and has become a major concern in the West European countries that have done best in containing income inequalities. International financial crises, if not more frequent than before, are severer and especially damaging to the developing countries. They include the debt crisis of the 1980s, the "peso" crisis of 1994-95, the East Asia crisis that began in 1997 and the present problems of Brazil and several other Latin American countries.

The notable exception in recent years to this deterioration has been the US, which has grown continuously over the last ten years and reduced its unemployment to the rates of the 1960s. Its success, though, is no evidence of the advantages of freer trade. The view popularised by some economists and the media, that it somehow indicates productivity growth caused by the freer markets and restructuring of firms, has no independent

empirical support. If it were correct, productivity in the US would have been rising exceptionally fast, and would, therefore, be exceptionally high now. Yet detailed comparisons with other developed countries do not show productivity in the US to be especially high.[1] In contrast, the countries that are supposedly the greatest laggards in restructuring their firms, Germany and Japan, are consistently successful exporters and run large trade surpluses. Which means that production in the US has risen, not by some unusual acceleration of productivity, but in the usual way, through investment. Since the saving rate of the US has always been low by the standards of the developed countries and is now zero, it means that the investment has been financed by the rest of the world. This is apparent from the US balance of payments, which shows that the net inflow of capital to the US each year since the mid-1980s has, on average, been several times greater than the total gross inflow to the developing countries.[2] Moreover, many developing countries are net exporters of capital to the US. To this must be added the great gains to the US from terms of trade movements in recent years, which have been mostly at the expense of the developing countries. For these developing countries, in particular, the economic performance of the US is not evidence that they will benefit from free trade.

A detached non-economist, observing that economic performance has been deteriorating around most of the world, might ask whether the theories by which economic policies are made might not be at fault. If the theories of international trade were expounded to him he would also be astonished by how little they explain and by how often they conflict with reality. And he would wonder how the main conclusions of the theories, that free trade is in some sense optimal, can be so confidently asserted when the empirical evidence is so much against the theories themselves. In a natural science a theory is not accepted until it has been tested empirically and, when the wellbeing of people can be seriously affected, notably in medicine, procedures and products are tested to ensure their efficacy and to ascertain their side-effects before they can be used. Economics is different: the optimality of free trade asserted by neo-classical trade theory is inherently untestable, being a comparison between the welfare of people in two alternative states; theories of international trade either conflict with reality or take forms that are too general to be tested, and side effects are rarely acknowledged. Nevertheless, the economist can give, even impose, advice on the basis of these theories, though it affects whole countries.

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[1] A typical case: none of the US car manufacturers can equal Japanese productivity, though Ford is said to be catching up. See, 'Ford Narrows Productivity Gap" in the *New York Times*, June 18, 1999. p.C6.

[2] The annual average net inflow from 1984 to 1996 was $115 billion. In 1997 it was $150 billion and in 1998 it was $230 billion.

The purpose of this article is to show that the non-economist's doubts are justified. It is in two parts. The first describes some of the failures of orthodox neo-classical theories of international trade to predict or describe the patterns of trade around the world and the consequences of applying policies that derive from them, and it shows that these failures are the consequences of unsound reasoning and incoherence in the theories. The second part, to appear in a later issue of this Journal, is intended to show that a simpler and more realistic approach to constructing a theory accommodates and explains the phenomena that neo-classical theory can not.

The Heckscher-Ohlin Theory

I. The Formal Theory

The H-O theory asserts that a country's trade is primarily determined by its endowments of factors. In formal terms, it assumes a given set of goods and a given set of factors and that the output of each good is determined by a production function whose arguments are the quantities of factors needed. The theory commonly assumes that returns to scale are constant and that production functions are the same in all countries, assumptions that can be taken literally, though their purpose is to see how much can be explained or predicted by factor endowments alone. At any time, each country is endowed with specific quantities of each factor and equilibrium occurs in free trade when consumers maximise their welfare, given the prices of goods and their incomes from factor earnings, while competition ensures that the distribution of production between countries and the allocation of factors within them are such as to minimise cost. With suitable assumptions about the forms of consumer preferences and production functions, the theory, stated in such formal terms, leads to the conclusion that equilibrium is Pareto optimal.

This raises two problems. The first is a problem of method. To be useful, the theory must be tested empirically but, stated in such formal terms, it is too general to yield any specific explanation or prediction about the pattern of trade or the prices of factors. It is also too complicated to use empirically to calculate or predict these things; just the trade of a few major economies, involving large numbers of goods, is enough for the compilation of data on factor endowments and estimations of production functions to be practically impossible, even assuming away the complications of consumer preferences and the relations between consumer incomes and factor prices. Consequently, the theory has never been applied empirically in its general form to explaining world trade, or even the trade of a few countries, and in that form, it remains an abstraction.

The second problem is that the basic assertion of the H-O theory is normally held to be, "a country exports the goods that use relatively intensively the factors with which it is relatively abundantly endowed", and, to be meaningful, the assertion needs two assumptions. One is that there is a consistent definition of relative abundance and relative intensity, i.e. rankings of factor endowments and intensities. For instance, the relative abundance of two factors in two countries is measured by comparing the proportion in one country of the endowment of one factor relative to the endowment of the other with the proportion in the other country. Then relative abundance is unambiguous; if one country is relatively abundant in one factor, the same procedure shows that the other country is relatively abundant in the other. But, if the factors are more than two, one country may be relatively abundantly endowed with one factor if it is taken as a proportion to a second factor, but the other country may be relatively abundant with the first factor if the proportion is taken relative to a third. The second assumption for the basic assertion to be meaningful is that there are no factor reversals, i.e. any ranking of factor intensities does not change with the prices of goods.

The basic assertion, as given above, cannot be dismissed as a sign of a lack of rigour, a popular simplification, a didactic device or any other departure from the correct theory. It is important because it implies, in practice, that the factors with which a country is relatively well endowed are easily determined and, therefore, that its trade and the effects of the trade on factor prices are predica table, in broad terms at least. Both Heckscher and Ohlin, the original formulators of the theory, regarded it in this way, as is obvious from their use of examples. Similarly, when Leontief tried to measure the relative capital and labour intensities of US exports and import competing industries, it was thought obvious that the US had larger amounts of capital per head than Europe. Developing countries are commonly taken to be labour abundant, unless a large part of their income comes from some mineral resource, such as oil. The appeal of the H-O theory, as compared to other neo-classical theories that lead to the conclusion that free trade is Pareto optimal, lies in this ease of interpretation.

A ranking of factor endowments and intensities can be assured in two ways. The more common is to assume two factors and no factor reversals. This is standard fare in textbooks and in theoretical and empirical work on international trade. Some of the most important conclusions of trade theory depend on it. For example, the Stolper-Samuelson theorem, according to which the price of the relatively scarce factor in a country is lower relative to the prices of all goods in free trade than it is in autarky,

holds for two factors but not for more.[3] Alternatively, a ranking of factor endowments can be assured by comparison with a scale common to all countries, the only obvious one being the total of the endowments of all countries of each factor. Vanek shows that, ranking each country's factors according to their shares in the total of all countries, the exports of any country will, in the aggregate, use more of the factors with which the country is relatively well endowed than do its imports, provided all countries have the same factor prices. Since the conclusion is confined to aggregate exports, a country may export some goods that use relatively intensively factors with which the country in not well endowed.

Because relative factor abundance is always defined in it, the case of two factors is not simply a didactic simplification of the general case. So the economist must choose between taking it literally as the basis of the theory or, if he wants to avoid the loss of generality, reverting to more factors. The former is the more common choice, but its conclusions conflict with reality and have, consequently, given rise to much discussion and empirical work, some of which is the subject of this article. These conflicts do not necessarily arise with the alternative choice of more than two factors, but then, either the inability to make any general statement about trade must be accepted or factor prices must be assumed equal in all countries to allow the use of Vanek's result, on the assumption that factor endowments in all countries and production functions for all goods can be estimated.

II. Two Factors

The Leontief Paradox

The theory failed its first and most obvious test. The US had more capital per head than any other country in the early years after World War II, but its import competing goods were discovered to be made using more capital than its exports, the Leontief Paradox. Many objections were raised regarding the method and data, but improvements have not yielded results that support the theory. Some economists do not accept the validity these calculations and others, such as Krugman and Obstfeld[4], believe that the H-O theory must be abandoned to allow for differences in productivity between countries.[5] But many economists accept Leontief's results and try to account for them with modifications of the theory. Two modifications have been proposed that keep the number of factors at two.

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[3] Chipman. Section 3.6.

[4] This paper refers often to the textbook by Krugman and Obstfeld because it is one of the most widely used textbooks on international economics and representative of neo-classical theory.

[5] Krugman and Obstfeld.

The first was proposed by Leontief himself, who argued that labour should not be measured in terms of man-hours and that qualitative differences should be allowed for. A US worker had to be considered the equivalent of more than one foreign worker and, if he were considered the equivalent of three, the US was, contrary to appearances, labour abundant. Although many economists thought the idea had merit, they balked at the number three, a superiority of 25-30 per cent seemed reasonable, but not 200 per cent. Besides, it might make the theory less plausible to other countries. Leontief's argument also had the drawback of putting in question all measurements of factors; if labour could not be measured simply, why should it not be the same for capital or land? His modification would have rendered the theory excessively elastic and has not become orthodox.

The second modification was to assume factor reversal. It was widely accepted for a while, but empirical evidence for it has been hard to find. Besides it, too, threatens to make the theory useless; if factor reversals are common enough to yield the Leontief Paradox for the biggest trade account of the world, the basic assertion of the theory cannot even be made as a probability.

Factor Price Equalisation

A second test is afforded by the theory's predictions of the effects of trade on factor prices. According to the theory, trade will, in each country, raise the prices of the abundant factors relative to the prices of goods. For developing countries this means a rise in the earnings of labour. Samuelson, however, showed that, with two factors, the prices would be the same in all countries that did not specialise in one good. What had seemed to be an encouraging prediction for the developing countries had turned into a problem for the theory.

The obvious way to avoid factor price equalisation is to see, if factor prices are not equalised, whether the countries do not specialise, which is to say to check if the conditions for equalisation hold. Although developing countries may be regarded as specialising in a few goods each, it fails for the European countries in the 1950s and 1960s and Japan in the 1960s and 1970s, which did not seem to specialise to the extent required and yet had lower wage rates than the US.

A second way is to assume factor reversals, which remove the one-to-one correspondence between the prices of factors and goods that leads to factor price equalisation. Then countries can trade goods at the same prices and yet have different factor prices. But the same objection holds as before,

is one to assume that factor reversals are so common as to cover most trade between Europe, Japan and the US?

A third way, put forward by Krugman and Obstfeld[6], among others, is to assume that production functions are not the same in all countries. It is a modification that some economists avoid because it eliminates the H-O theory itself, since the argument leading to the basic assertion relating exports to factor endowments requires that production functions be the same.

A fourth way, also put forward by Krugman and Obstfeld, Ohlin and others[7], is to attribute differences in factor prices between countries, at least partly, to trade restrictions and transport costs. To be plausible it must explain how the relatively small differences in prices attributable to trade barriers and transport costs can cause such big differences in income as, for instance, between Brazil and the US. It must also establish that the price differences that do exist can be ascribed to these causes, and then explain why developing countries should inflict this on themselves since it is they who have the most trade barriers, points to be discussed later.

A fifth way, analogous to Leontief's attempt to explain his Paradox, is to argue that appearances are misleading and that factor prices are equalised, but most of what is taken to be wage is actually earnings on capital invested in the workers, human capital. This interpretation of wages was devised by Gary Becker. Since workers with similar skills earn differently in different countries, Becker takes the interpretation further to the worker's birth, saying:

> 'The term x represents the earnings of a person that are unrelated to human capital invested in him, and are presumably, therefore, largely independent of his current choices. Particularly in developed economies but perhaps in most, there is sufficient investment in education, training, informal learning, health and just plain child rearing that the earnings unrelated to investment in human capital are a small part of the total. Indeed, in the developmental approaches to child rearing, all the earnings of a person are ultimately attributed to different kinds of investment made in him. Consequently, there is a considerable justification for the assumption that x is small and can be neglected, an assumption we make in this paper.'

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[6] Krugman and Obstfeld. Op. cit. p.76

[7] Krugman and Obstfeld. Op. cit. p.76-7. Ohlin. Op. cit.

The superiority, in this sense, of the worker of the developed country is not genetic, but it starts from birth, or perhaps conception, and is passed on to the offspring.

III. More Than Three Factors

Both the Leontief Paradox and factor price equalisation can be avoided by assuming that the number of factors is greater than two, at the cost of not having a verifiable theory. This is done in several ways, e.g. by assuming that the factors are labour, capital and land. Then the argument goes, the US is abundant in land and exports land intensive goods, i.e. agricultural products. Alternatively, the US exports technology intensive goods and technology should be considered a factor. Or skills are a form of capital and US exports have a higher average of labour skills, measured in terms of years of education, per unit of output than its import competing industries. These various factors do not need to be examined individually, because they still fail to explain US trade.

If factor prices are not equalised around the world, the US cannot, according to the theory, at the same time export capital intensive, labour intensive, land intensive and skill or technology intensive goods, although that is what it does. Alternatively, assuming that factor prices are equalised gives the possibility that the US exports various goods that use different factors relatively intensively as long as its exports in the aggregate use the relatively abundant factor relatively intensively. The justification could be that factor prices are approximately equal in Europe, Japan and the US, the economies that account for most of the world's trade, and, hence, that Vanek's result is likely to be roughly true. But if the abundant factor in the US is capital the Leontief Paradox remains, since its calculations of factor use were done for aggregate exports and import competing industries. And if some other factor is more abundant in the US the H-O theory can say nothing about the pattern of trade until the amounts of each factor in all the countries have been measured and added, an unlikely exercise given the complications of quantifying technology, education, different types of land and so on.

Finally, factor price equalisation can be escaped by assuming that the number of factors is greater than the number of goods. If the number is smaller factor prices can be assumed to equalise and if factors outnumber goods, the chances of factor price equalisation are zero. The disadvantage is that, if the number of goods is large, so is the number of factors. Then making comparisons of relative factor endowments and estimating production functions may become overwhelming. For example, if the number of factors is only 10, the number of relative factor intensities

becomes 9!, i.e. 362,880. Even if only a fraction of them need to be calculated, they must be calculated for all countries.

IV. What is a Factor?

The naïve non-economist to whom the H-O theory has been explained might want to see the list of factors that determine trade and would find it odd that there is no official list. He would also find it odd that the reason is not that different schools of thought put forward competing lists, but that economists do not think it necessary to specify the factors exhaustively. The non-economist would think that the theory can only be held to explain trade if the goods or groups of goods and the factors have been specified, but economists prefer to leave the choice of factors open. Books and papers in international trade often assume two factors, variously labelled land and labour or capital and labour, but they also add factors, like human capital or technology, or subdivide factors into different types of land, capital or labour. He would find it still odder that no economists have decided whether the number of factors is greater or less than the number of goods, although that determines what the range of relative prices of goods can be and whether factor prices will be equalised or not. Instead, economists prefer to treat this as a matter of choice.

One answer to the non-economist might be that definitive specification of factors is unnecessary, that the goods and factors should be specified according to the problem at hand. This seems to have been the view of Ohlin, whose book discusses the questions of defining and identifying factors at length. No economist since then seems to have devoted that much effort to these questions. Ohlin talked of factors and sub-factors. According to him, labour can be divided into three sub-factors "in most cases"[8], though if a "few engineers have a special knowledge of a particular technical process" they might be considered a separate sub-factor.[9] But he adds that it may be necessary to reckon with a much greater number of factors "because of soil, climate, wind, humidity, or surface..."[10], to which can be added that a sub-factor like mineral deposits must be further sub-divided according to the mineral, e.g. copper, iron, bauxite, oil and so on.

But this answer prevents any ranking of factor endowments. If the factors can be sub-divided arbitrarily, what is being compared with what? If the numerators are changed, so are the denominators. Because of this Ohlin repeatedly lapses into explaining trade by the abundance, not the relative

[8] Ohlin. Op. cit. p.51.
[9] Ohlin. Op. cit. p.64.
[10] Ohlin. Op. cit. p.55.

abundance, of factors. His argument for the basic assertion of the H-O theory consists entirely of examples and nearly all of them concern various types of land: Swedish forests, Swedish iron ore, American wheat-lands, British coal in the nineteenth century and so on. Compared to what these factors are relatively abundant is not specified. Even when Ohlin ventures to examples in industry, such as the number of chemists in Germany in the late nineteenth century or of jewellers in Pforzheim in the sixteenth, he states them in terms of absolute numbers or implicit comparisons with numbers in other countries or regions, not in terms of comparisons with the amounts of other factors.

The conclusion to be drawn is that the H-O theory is practically impossible to verify. Examples, such as those given by Ohlin, are not evidence. That the area under forest in Sweden, the area under wheat in America and the number of jewellers in Pforzheim are large and therefore likely to be large relative to the amounts of other factors is not enough. It is no different to the reasoning of the economist who asserts that the H-O theory is valuable, despite its shortcomings, because it explains why Kuwait exports oil.[11] The evidence needed is twofold: firstly, amounts of factors that are not necessarily large compared to the amounts in other countries but are large relative to the amounts of other factors in the same country; secondly, calculations of the factor intensities of goods, including direct and indirect inputs. Such evidence is difficult to find; the calculation of the intensities of capital and labour use in exports and import competing industries in the US that revealed the Leontief Paradox required an input-output table for the US economy. But it was made easier because there was no need to compare capital per head in the US with the ratio in other countries; the consensus was that the US was capital abundant in the sense of the theory. As soon as the theory moves away from the basic two or three factors, neither the international comparisons of relative factor abundance nor the calculations of factors are likely to be feasible.

Haberler's Representation of International Trade

I. More General, Less Specific

A general representation of international trade, devised by Haberler, assumes production possibility sets of countries to be convex and uses opportunity costs, or marginal rates of substitution between goods along the boundaries, or frontiers or transformation curves.[12] It is

[11] Mannur, H. G. International Economics Vikas Publishing House, New Delhi. 1995.
[12] Haberler. p.175.

general in the sense that it includes not only the H-O theory and any other theory with a neo-classical representation of production, but also the classical theory of Ricardo. In particular, it allows for factor endowments with production functions that differ from country to country. By the same token, it avoids specifics, it presupposes no particular explanation of the opportunity cost. Nevertheless, it leads to the desired conclusion that free trade is optimal. As Meade puts it in his book, "Trade and Welfare", 'As a formal proof of the case for free trade there is really nothing to be added ...'.[13]

The generality and lack of specifics account for its appeal for the neo-classical theory of trade. In leaving open what determines opportunity costs or marginal rates of substitution, Haberler's representation avoids the comparisons with reality that bedevil specific theories. How the H-O theory fares in such comparisons has just been discussed. Ricardo's theory, though taught as a normal part of international economic theory, is not accepted by most economists because it rests on the assumption that costs and outputs are determined solely by labour inputs. Haberler's representation lets proponents of neo-classical trade theory both draw general conclusions about the benefits of free trade and escape the frustrations of not being able to answer questions, such as what the pattern of trade and the costs of factors will be. For someone who wants to explain the pattern of trade this is of no use, which seems to be why Ohlin said of it, "such a reasoning explains very little, unless connected with a mutual interdependence price system and is as different from the doctrine of comparative cost as anything can be."[14]

Despite Ohlin's strictures, Haberler's representation is used often and, consequently, further discussion here of neo-classical trade theory must refer to it. For instance, Meade used it as the basis for his book precisely because he wished to avoid specifics about what goods countries in reality import and export or how their factor prices might be affected. He enters into specifics only when he needs to discuss income distribution, in Chapter XVIII, and factor movements later on. Krugman and Obstfeld escape to the Haberler representation from the Heckscher-Ohlin theory, which they abandon because of the Leontief Paradox. They term it a Ricardian approach because differences in productivity between countries are taken as given. The following discussion of neo-classical trade theory switches between the Haberler representation and the H-O theory as the need arises.

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[13] Meade. Op. cit. p.142.
[14] Ohlin. Op. cit. p.8 footnote.

II. Trade Barriers

Income Distribution

General though Haberler's representation may appear to be and however widely used, its conclusion about the optimality of free trade is not borne out in practice; trade is not and rarely has been free. Dani Rodrik, a neo-classical economist who distinguishes himself by confronting the problem squarely and not fudging the answers, says, 'Perhaps no other area of economics displays such a gap between what policy-makers practice and what economists preach as does international trade. The superiority of free trade is one of the profession's most cherished beliefs, yet international trade is rarely free.'[15]

At bottom, the problem is that the only things trade barriers do of which neo-classical trade theory admits are change the distribution of income and change the terms of trade. The latter is assumed to be rarely possible; it is ignored by Rodrik and will be ignored here. But trade barriers are a bad way of changing the distribution of income. Consequently, as Rodrik concludes, the models devised to explain them are 'highly specific'[16], meaning that each uses assumptions suited only to specific countries, products or circumstances. Since interference with free trade is 'essentially a universal phenomenon'[17], they do not make for a satisfactory explanation. He also points out that the models show no plausible reason, other than the revenue yielded by import duties, why it should result in barriers against imports rather than in export promotion.[18] Yet tariffs persist in countries that do not need the revenue. Rodrik could have added that developed countries have shifted more to the use of quotas and voluntary export restraints, which bring in no revenue and can raise the prices of imports; they want the protection even when the cost to them rises.

What Does History Say?

If, however, the distribution of income is not the only motive for not letting trade be free, no convincing explanation compatible with neo-classical trade theory may be possible. Some grounds for believing that this is so are given by Rodrik's survey of the models devised to provide explanations of why trade is not free. Though succinct, it seems to leave nothing of consequence to be added and yet he has to conclude that protection is still a puzzle.

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[15] Rodrik, Dani. p.i of Non-Technical Summary.
[16] Rodrik. Op. cit.
[17] Rodrik. Op. cit.
[18] Rodrik. Op. cit.

It is less of a puzzle when the problem is recognised to be broader than Rodrik's statement quoted above seems to imply, for the statement refers neither to history nor to the motives, other than redistributing income, that have been given for protection. History does not support the belief that protection has much to do with income distribution. Only two economies have developed on free trade, Britain and Hong Kong; the former happened to be the first country to industrialise and became a zealous proponent of free trade, while the latter's circumstances were too peculiar to be a guide to others. Textbooks usually mention that particular countries have had protection in their pasts, for instance Krugman and Obstfeld, referring to Germany, Japan and the US, say, 'it is a historic fact that the world's three largest market economies had begun their industrialization behind trade barriers.'[19] But their candour does not go so far as to mention that the list of countries that industrialised without trade barriers has only two entries.

The contrast between Portugal and Prussia in the nineteenth century illustrates the point. When the Portuguese authorities attempted to protect the local textile industry against British imports and to interfere with the British businesses in the country, they received from Palmerston, the British Foreign Secretary and a doctrinaire free trader, a series of stern lectures on comparative advantages and the benefits of free trade. Eventually British gunboats ensured that British interests and free trade were respected. Palmerston was equally stern in admonishing Prussia to abide by free trade when it resorted to protection, but Prussia was militarily stronger than Portugal and he was too astute to use gunboats there. Prussia, and under its leadership, Germany had, by the start of the First World War, become the largest and most advanced economy on the continent of Europe and rival to Britain. Portugal remained economically backward until the European Union recently began to subsidise its development.

Even the present relative freedom of trade among the developed countries is evidence that the purpose of trade barriers is more than the redistribution of income. Trade among the countries of West Europe and North America only became moderately free after West Europe had recovered from World War II. The Kennedy Round of trade negotiations took place in the 1960s and the Tokyo Round in the 1970s. By then all these countries were prosperous as never before and Japan had become an industrial power. Trade within West Europe was liberalised in parallel, starting with the Treaty of Rome and going through several stages: the Common Market of seven countries, the European Free Trade Area of six countries, the European Community and now the Union, with smaller steps

[19] Krugman and Obstfeld. Op. cit. p.257.

within each stage. The long time it took is hard to explain in terms of income redistribution. West Europe and North America were committed to free trade, as evident from the way they had set up the G.A.T.T., whose rules ensured that change could only be towards that end, and from their repeated negotiations with the stated intention to reduce, and prevent increases in, trade barriers. Hence, the advocates of free trade must have been in the ascendant, so why was progress so slow?

The Stated Motive for Trade Barriers: Unemployment

The motives that those who make or carry out policy put forward for trade barriers must also be considered, and they are not often the redistribution of income. Apparently unambiguous cases like the English Corn Laws, which Ricardo criticised for protecting the incomes of landlords at the expense of industrialists, are not common. Parts of the European Common Agricultural Policy, of Japanese controls over rice imports and of US farm support some years ago have been, explicitly or not, means of protecting the incomes of agricultural populations, but they have also had other motives, such as preventing unemployment or keeping the countryside populated. The Corn Laws, moreover, are only made to appear straightforward nowadays by overlooking the rural unemployment caused by their repeal, though in Ricardo's day few people deemed unemployment to be a consideration.

Most often the motives given are the prevention of unemployment and some version of the infant industry argument, neither of which can be accommodated by neo-classical trade theory since both are departures from the assumption of efficiency. A proponent of the theory might maintain the unemployment caused by trade is simply one form of the income redistribution that trade causes. If imports of some products grow rapidly and cause unemployment by displacing domestic production, the creation of new jobs removing the unemployment is a move along the production frontier of the economy. He acknowledges that the unemployment might cause suffering (so did the G.A.T.T. with its provisions regarding market disruption and the US by imposing voluntary export restraints on Japan) but he claims it is transitory and believes that the succession, from 1960 to the present, of "arrangements" restricting the textile exports of developing countries to developed countries is not to be considered the norm.

Though common, this interpretation of unemployment conflicts with the changes that actually occur in such a situation. If imports of textiles or motor cars grow rapidly and domestic textile mills or Chrysler are closed, their workers lose their jobs. As far as neo-classical theory can describe it, these workers find new jobs as the economy's endowment of

capital is reallocated. In reality, the capital equipment of the textile mills or Chrysler falls idle and new equipment has to be created to remove the unemployment. Old capital stock is destroyed, new stock is created and the latter presupposes investment and saving.

Several alternatives are then possible. One is that the new jobs are created quickly and the investment per head is the same as before. Then the value of the country's capital stock might remain unchanged and may give the appearance of the reallocation of an initial endowment. A second is that the new jobs are created with more investment per head, perhaps because the country moves from a labour intensive activity to a more capital intensive one. Then the value added per worker and GNP rise because the capital stock has risen.

A third possibility is that investment does not suffice to absorb the unemployment; old capital stock lies idle while not enough new capital stock is created. Unemployment can not as a rule be assumed away; it obviously exists, can persist and may be too great to be ignored, as shown by the present rates in Europe and the rates in the US for most of the time from 1960 to 1990. It cannot be supposed different and, hence, transitory merely because it has been caused by the rapid growth of imports. In particular, the aftermath of trade liberalisation in developing countries is usually the closure of firms, a rise in unemployment and a lasting fall in investment. Whether or not the closed firms were so inefficient as to have reduced real income by their operations, for which no *a priori* assumption can be made either way, their capital stock cannot be said to have been reallocated to more efficient use unless the equipment is actually put to use. Usually it lies idle.

In the foregoing the change in trade was taken to be the growth of imports, but taking it to be a change in prices instead, makes no difference. A change in prices is the more common presentation in textbooks because it is easier to depict in neo-classical trade theory, which mostly consists of comparative statics, and is not designed to deal with processes through time. The effect of a change in prices is depicted by a change in the tangent to the production frontier of the country. Less is produced of the good that becomes cheaper, more of that which becomes dearer and the previous remarks apply here too.

The Stated Motives for Protection: Infant Industries

The other main reason given for protection is the infant industry argument, taken in a broad sense to say that the competitiveness of an industry or a firm depends positively on past production in that and related

industries and firms. Like unemployment, it does not fit into the representation of production of the neo-classical theory of international trade. All the infant industry argument is intended to assert is that firms cannot become competitive without having been in operation for some time, that they need experience, their own and that of related activities, to improve. It does not mean that they necessarily become internationally competitive in time (they might, as often pointed out, simply remain inefficient) but they cannot become competitive otherwise. The condition is necessary, but not sufficient. The formulation can, no doubt, be improved, but some vagueness and generality are unavoidable since they reflect the present lack of understanding of how firms in developing countries function and what determines whether or not they become competitive.

In purely formal terms, the infant industry argument is generally accepted, but it is almost as generally opposed on supposedly practical grounds. The arguments against it are primarily that protection allows inefficient firms to be started as well as potentially competitive ones, that protection then becomes difficult to reduce, that the cost of misallocation of resources is high and so on. Their truth is borne out by experience; in few developing countries have industries established under protection become internationally competitive, reduction of protection has almost always been opposed by the owners and employees of the protected firms. When it happens it is the result of external pressures like a round of negotiations under the G.A.T.T. or conditions imposed by the World Bank or IMF, and, if protected firms take long to become efficient, the costs to the economy may be excessive.

But none of this leads to the conclusion that economists and institutions like the WTO, the World Bank and the IMF wish to reach, namely that the evidence demonstrates the superiority of free trade over protection as a way to industrialise. On the contrary, it still demonstrates the opposite. The conclusion they want would follow only if they could show that no country had industrialised with protection and that countries do industrialise with free trade. As pointed out earlier, neither is true. When economists, the World Bank and the IMF expatiate on the failures they do not dwell on the countries that have industrialised on free trade, since they are only eighteenth century Britain and modern Hong Kong, and protection that has been successful they present as having been modest, as against the conclusions of standard works, like those of Amsden and Wade, which describe at length how closely trade was controlled by the authorities and how misleading tariffs figures can be as indicators of protection and government activity.

Part of the reason for the opposition to the infant industry argument is that the neo-classical theory of trade cannot analyse it. Neo-classical trade theory represents a country's economy by a production frontier and trade by a point on a tangent to it, and what cannot be accommodated in this representation is precluded. The crucial element of the infant industry argument is that the efficiency or competitiveness of a firm depends on past output. Such a dependence, the so-called learning curve, has long been accepted in economics and is routinely used by long established firms to plan the production of complex products, the best known example being aircraft. Part of the infant industry argument is that newly established firms have analogous learning curves for simple products. Its inconvenience is that present costs are not just functions of present inputs and prices and, consequently, cannot be included in the neo-classical framework for analysing trade.

Another illustration of how something can be precluded by neo-classical theory is given by Krugman and Obstfeld, who raise the question, 'why not encourage both import substitution and exports?'[20] Their answer is that either course draws resources from the other, both are moves along the production frontier, but in opposite directions. Given the assumption that the economy is at a point on a production frontier and can only move along it, they are right. But the practice has been used repeatedly and successfully on a large scale in Japan and Korea, among others. For example, firms were able to establish themselves in export markets by cross-subsidising their exports from profits from domestic sales. A well established fact, one, moreover, widely acknowledged and associated with success, is precluded by *a priori* reasoning.

A further aspect of the opposition to the infant industry argument is that it imposes difficult obligations on economists. What the many failures show is how hard it is to succeed. At the same time, the failures of free trade show that protection is essential. Hence, the advice developing countries need is how to create conditions for protection to foster infant industries that become competitive. Little advice of this sort is transmitted by development economists or international organisations, although the institutions and policies that led to the successes of Japan, Korea and Taiwan have been much studied. Perhaps this is partly ideological, a preference for propagating free markets. But the study of policies and institutions in the concrete, as opposed to the abstraction of economic theory, is hard and often inglorious work. The formulation of advice adapted to the needs of a specific country and the effort and patience needed to apply it and, almost always, to improve it in the light of experience are even

[20] Krugman and Obstfeld. Op. cit. p.259.

harder and earn still less glory. Naturally economists and some international organisations prefer simple prescriptions, such as the removal of trade barriers, come what may.

Lacking the framework for discussing infant industries, neo-classical trade theory is an obstacle to understanding what makes for successful industrialisation. Thus Krugman and Obstfeld argue that private investors in developed countries do not need government help even for investments whose returns 'lie far in the future'. So, if markets are allowed to function properly there is no reason why the same should not be true for developing countries. Yet market liberalisation in developing countries is almost always followed by a lasting fall in investment.[21] The question that should be asked is why do entrepreneurs in developing countries hesitate to invest when markets are free? Again, through *a priori* reasoning economists make one of the most important problems of developing countries vanish.

The point is illustrated by the example they give, 'The US biotechnology industry, which attracted hundreds of millions of dollars of capital years before it made even a single commercial sale'.[22] What concerns an entrepreneur setting up a manufacturing firm in a developing country is that he will have to compete with imports that will have been coming in before he starts and that he may need time for his firm to be able to compete with them. Obviously the biotechnology firms of the example did not have this concern.

Capital Goods and Prices

I. Production Frontiers and the Means of Production

What prevents neo-classical trade theory from discussing unemployment, infant industries and investment is that the production frontiers these economists postulate do not distinguish between short and long term rates of substitution. Taking the simplest general formulation, the prices of goods are proportional to the marginal rates of substitution along the production frontier. In practice, that the price of a car is 30 times that of a buffalo does not mean that 30 buffaloes can be transformed into a car overnight. If it means anything related to movements along production frontiers, it means that reallocating resources to produce 30 fewer buffaloes, allows the production of one car more. This is a long run rate of substitution. Since cars are produced with capital goods and the economy is assumed to be at its production frontier, more capital goods have to be

[21] Serven and Solimano.
[22] Krugman and Obstfeld. Op. cit. p.258.

acquired. (In the meantime the means of production of buffaloes are consumed or languish.) Being manufacturers, they must either be made locally or be imported, a decision that depends on the relative prices of the locally made and imported varieties. If production of these capital goods also uses manufactured capital goods, the prices of the former depend on the prices of the latter and so on. The upshot is that the production frontier is determined by the prices of goods.

Consequently, most of the reasoning of neo-classical trade theory fails. Short run marginal rates of substitution are not proportional to prices and the long run production frontier shifts with prices. The consequence can be escaped in three ways, none of which meets the needs of international economic theory. One is the escape used for the closed economy when confronted with the problems of measuring capital, of which this is an example, namely to resort to inter-temporal general equilibrium. Then, production frontiers have to be interpreted as inter-temporal and movements along them are comparisons of different inter-temporal equilibria, not movements from one to another. General equilibrium models of this kind with several countries appear not to exist, though, if any do or some were to be devised, their relevance to explaining observed patterns of trade and income and to policy recommendations for developing countries would need to be demonstrated. A second escape is the small country assumption. World prices for all goods are assumed to be given and then so is the production frontier. But the purpose of the theories of Ricardo and of Heckscher and Ohlin, to explain trade, is abandoned. The third escape is to assume that capital can be treated as a malleable substance i.e. to deny the problem. In this case the neo-classical theory of international trade can be preserved unchanged as an economic phantasy.

In the H-O theory the dependence of the production frontier on prices takes a special form, the dependence of the endowment of the factor, capital, on prices. The reasoning is the same as used for the production frontier. Capital goods are produced, hence their prices depend on the prices of factors, and they are factors, themselves. Hence the endowment of the factor, capital, depends on prices. Various attempts to find a way of measuring the stock of capital independently of prices have been tried without success and it is now accepted that it cannot be done.

II. The Balance of Payments

The distinction between short and long run production frontiers requires that comparisons be regarded as changes over time. In contrast, most of neo-classical trade theory consists of comparative statics. But change includes changes in capital stock, at least its composition, if capital is not

assumed to be a malleable substance, and hence investment. Investment entails saving and, together, the two lead to the discussion of growth. Standard neo-classical trade theory has no place for these concepts. Krugman and Obstfeld, whose textbook is typical in this regard, have no reference to saving, investment or growth in the part of their book dealing with the theory of trade; all such references occur in the part dealing with the balance of payments. The book by Helpman and Krugman does not discuss the balance of payments, since its purpose is to explain how neo-classical theory with product differentiation and increasing returns can account for some of the phenomena that ordinary neo-classical theory cannot, and, therefore, has no references to these quantities either.

The non-economist might think it odd that precisely the part of international economics dealing with production should have no place for investment and saving, and that it cannot, therefore, be used to discuss the balance of payments, one component of which, the trade balance, is equal to the balance of saving and investment. The result is a dichotomy in international economic theory evident in every textbook on the subject; trade and the balance of payments are discussed separately with different concepts and assumptions and no part of the book provides a synthesis or even an indication of how the two can be united on a common set of concepts and assumptions.

One consequence of the dichotomy is that orthodox prescriptions for trade policy and for improving the balance of payments lead to stagnation rather than growth. Developing countries are more affected than the developed countries since they are more likely to pursue adjustment and stabilisation programmes prescribed by the World Bank and the IMF. Adjustment programmes commonly require countries to reduce trade barriers, if they have not done so already. Stabilisation programmes are intended to improve the balance of payments by reducing the trade deficit. The former are purportedly justified by the standard neo-classical trade theory; the latter by improvements that follow from reducing domestic absorption. The normal outcome is that some of the country's industries succumb to foreign competition, their capital stocks fall idle and are eventually lost. At the same time consumption and investment are restrained so the replacement of the lost jobs is deferred until investment recovers. Investment may recover slowly, if at all. For neo-classical trade theory the problem does not exist, as already pointed out; either "resources" are allocated more efficiently by a movement along the production frontier or investment is certain to take place, provided the markets are free and competitive. In reality, the increased competition from foreign producers may deter domestic investment, and in several developing countries investment has declined following trade liberalisation and never recovered.

Then the wealthy of the countries often prefer to take their money out, if they can, and, incidentally, finance the US trade deficit.

III. Prices and Comparative Advantages

Prices in Domestic and Export Markets

One element of the notion of comparative advantages is that any set of relative prices of goods, at least over a broad range, can be reached by appropriate factor prices with competitive markets and all factors fully employed. (If the number of factors is smaller than the number of goods, the degrees of freedom of the prices of goods will normally be the number of factors. Moreover, not all countries produce all goods.) From this element follows the essential notion of comparative advantages, namely that equilibrium in free trade is reached through adjustment of factor prices until the relative prices of goods are the same in all countries, with all markets competitive and all factors fully employed.

This prerequisite, that relative prices of goods, transport costs and trade barriers aside, be the same in all countries, is contradicted by the evidence. For a long time this "law of one price between countries" seemed too obvious to need verification; it seemed obvious that, if markets are competitive, profit maximisation and arbitrage will prevent price disparities. Taking the same reasoning further leads to the stronger conclusion of "purchasing power parity for tradables in its absolute form", namely that prices of tradable goods in different countries, compared at the going exchange rates, will be the same. But doubts began to arise when tests showed that purchasing power parity was not valid; comparisons of movements of price indices and exchange rates of different countries showed disparities that were too great to be explained by the characteristics of the indices, notably their inclusion of untradables and differences between countries in their composition.

Direct comparison of prices in several countries of certain goods by Isard in 1977 gave direct evidence against the "law of one price". Isard compared the prices of five commodity groups, ceramic tiles, soap, steel bars, tyres and wallpaper, in Canada, Germany, Japan and the US. He found that unit values fluctuated erratically, but regressions of the ratios of unit values of US imports and exports showed significant dependence on exchange rates for Germany and Japan, though not for Canada. Since then a

number of studies have given similar results and have confirmed that similar price disparities are common among manufactures.[23]

The first question in assessing the consequences of the divergence of the actual behaviour of prices of goods from the "law of one price" as given earlier is, is it so great as to make the "law" untenable and, hence, to negate comparative advantages even as an approximation to reality? Since no obvious, extraneously given magnitude seems available as a criterion for deciding the question, a criterion can be devised from comparisons of the prices of different goods. For, if the prices of certain goods are fairly uniform from country to country, large price discrepancies are not inherent to international trade and should not, presumably, occur for other goods. So, if they do occur, the possibility exists that some other mechanism is at work.

Such uniformity is the case for many primary products and for products, like plywood, that are only slightly processed, but not for manufactures.[24] The daily quotation in business newspapers of prices of certain raw materials and the news on their movements usually presuppose that these prices are much the same around the world, even if the prices in long term contracts differ from spot prices. In contrast, the prices of most manufactures vary and are the reason for the differences in the movements of different countries' price indices in the first place. Hence, if the theory of comparative advantages is to be preserved, some special reason must be found why prices of manufactures vary from country to country without invalidating the "law of one price".

In the opinion of a number of economists such a special reason is to be found in product and brand differentiation, though, again, the evidence is against it. According to this opinion, the effect of differentiation is that similar goods are not perfect substitutes. Isard, for instance, says, 'With widespread product diversification, most manufactured goods face finite elasticities of demand and are priced under conditions of imperfect competition'.[25] The argument, then, is that price differences between countries merely reflect product differentiation or differences of brand, and that the prices of two products that are similar but differentiated in some way may vary relative to each other.

In such broad terms the argument is insufficient. The assumption that elasticities are finite is not enough to reach a conclusion since it puts

[23] Dornbusch, Krugman, Krugman (2), Marston, Yang.
[24] Yang.
[25] Isard (2). p.60.

no limit to what elasticities can be. For example, if the price elasticities of substitution between two goods is greater than one, their prices will be equal in equilibrium. The argument is, moreover, irrelevant if the same brands and models of goods are priced differently in different countries. This is the phenomenon that prompted Krugman's original paper[26], which seeks an explanation as to why the prices in the US of BMW and Mercedes motor cars remained stable in dollar terms when the dollar rose to a peak of DM3.48 in early 1985 and then fell to MD1.50 in 1990. Krugman[27] also shows that the phenomenon was general in the sense that the US price index of imported manufactures moved almost exactly like the general US index of prices of manufactures, which can not be plausibly explained by the finiteness of price elasticities. Moreover, Marston's conclusion, that Japanese exporters tried to keep their dollar prices stable in the US, is consistent with Krugman's observations but not reconcilable with the elasticities argument.

The reason why the "law of one price between countries" fails for manufactures but holds for primary products appears to be that brand names are important in selling the former but not so for the latter. One of the two mechanisms that were believed to ensure that the "law" held under competition is profit maximisation, according to which a firm sells in whichever market offers the highest price. It assumes that the firm is indifferent to other considerations, notably market share. But that is not how firms with brand names behave. They regard market share as costly and difficult to acquire and not to be surrendered lightly. A firm that can not immediately increase its output is unlikely to shift a large part of its output from domestic to foreign sales since regaining the lost market share later will be costly and may be impossible.[28] It would, for the same reason, refrain from big price increases, which would equally be a surrender of market share.

The second mechanism, arbitrage, fails as well. It presupposes that the buyer is indifferent from whom he buys and the producer is indifferent as to who sells his goods. Consequently arbitrage with brand name products, though it does occur, is negligible. Producers are not indifferent as to who sells their products, because they have reputations to protect and guarantees and service agreements to fulfil. Buyers have corresponding motives for buying direct from the producer or from authorised dealers and retailers. Brand name goods sold at low prices outside the usual channels are often

[26] Krugman
[27] Krugman (2).
[28] Krugman (2).

suspected of being counterfeit, having sub-standard components or of not being backed by guarantees and service.

Summary

The argument of this article can be stated as follows. At present policies regarding international trade, in particular the advocacy of reduction of trade barriers, are formulated on the basis of neo-classical theories that have no empirical support. The theories are either in conflict with reality or do not yield conclusions that can be tested. The H-O theory with two factors is refuted by the Leontief Paradox and by the conclusion that factor prices must be equalised. It is also incapable of explaining why trade is so rarely free. Increasing the number of factors and allowing production functions to differ between countries enables neo-classical theory to escape this problem, but renders it incapable of making specific statements about the pattern of trade and the prices of factors. At its most general, following Haberler in representing economies as convex production sets, even factors are removed.

These problems are merely symptoms that the theories are fallacious. The main fallacy is to ignore that capital goods are produced and, hence, that a country's endowment of capital and its production frontier depend on their prices. The marginal relations on which the theories depend to determine prices and trade themselves depend on prices. But the theories are also fallacious in describing a world that does not exist. Prices of goods are not equal in different countries, even allowing for trade barriers and transport costs, though the markets in these countries may be competitive. It seems that markets do not behave in the way the theory supposes. The question arises, how much confidence do people put in these theories? No serious effort has been made to compile the list of factors that should figure in the H-O theory, or even to state whether they outnumber goods or not, although the answers are supposed to have important consequences. These are not indications of conviction, despite the zeal with which the policy consequences are preached.

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Note:

Analysis of Key Determinants of Tax Policy and Administration

Ahmad Khan*

Introduction

Similar to most countries, the objectives of the taxation system in Pakistan are not well-defined. Historically, the primary objective has been resource generation for the government. The taxation system has simultaneously addressed the secondary objectives of promoting area/sector-specific economic activities, discouraging undesired imports/production, encouraging savings and investment. These objectives were met through a variety of tax concessions and exemptions, rebates and credits, differentiated tax rates and tariffs. The revenue shortfalls/leakages resulting from preferential tax treatment of the desired activities were offset through appropriate changes in various fiscal instruments, e.g. high tax rates and tariffs, regulatory duties, extended withholding and presumptive taxes, excise duties on services, and many more. These measures, in turn, complicated the taxation system and adversely affected the equity, neutrality and progressivity thereof.

Consequent to the pursuit of conflicting objectives, Pakistan's taxation system is characterised by a number of structural problems. These include:-

(i) The low overall level of fiscal effort and the Tax-to-GDP ratio remains more or less stagnant at between 12 to 13 per cent.

(ii) There is over dependence on indirect taxes notwithstanding that the share of direct taxes has increased from 16 per cent in 1990-91 to over 35 per cent during 1997-98. This has increased the regressivity of the taxation system and imposed a higher excess burden of taxation.

(iii) Amongst indirect taxes, the dominant share continues from taxes on international trade (both customs duties and sales tax) which has promoted inefficiency, distorted resource allocation and encouraged illicit trade.

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* The author is former Member, Tax Policy, CBR and is presently posted as Member, Monopoly Control Authority, Ministry of Finance, Islamabad.

(iv) Effective tax bases of most taxes is narrow due to wide ranging exemptions/concessions and rampant tax evasion.

(v) The tax administration is characterised by conventional and inefficient work distribution, out-moded procedures, lack of appropriate skills, dependence on manual rather than automated functioning, considerable arbitrariness and discretion. The common perception about the taxation system is of corruption, inefficiency and arbitrariness.

With the background of the above structural problems and growing institutional decline and erosion of fiscal, financial and administrative discipline, low economic growth and high fiscal deficits, governments at various times have attempted serious structural reforms. Several task forces, committees and commissions on tax reforms were constituted to examine the reform issues and to recommend appropriate steps to improve the tax effort. The latest of such efforts was undertaken by the present government immediately after it assumed office in February 1997. The fiscal component of the Economic Reforms Package of March 1997 and the subsequent policy announcements through the 1997 and 1998 Budgets are part of a series of steps in this direction. Notwithstanding these major policy initiatives, adequate expansion of effective tax bases and increase in revenues as a percentage of GDP still remains a dream unfulfilled.

It is, therefore, imperative that the issues in tax policy and administration are examined in a candid and forthright manner, the underlying complexities and dynamics understood, and rational decisions based thereon implemented with full political support. A consensus on macro and micro details of the taxation system amongst the special interest groups i.e. government and the tax paying community, is a prerequisite for its successful implementation.

The present paper accordingly, examines within the overall macro-economic setting, the salient features and structural problems of the taxation system, assessment of previous tax reforms, and key issues in tax policy and administration. Specific recommendations to improve resource mobilisation, both in the short and long term, have been made. Policy and administrative aspects are discussed separately.

Macro-economic setting

While Pakistan has generally witnessed a satisfactory level of economic progress in terms of growth in GDP and structural changes in composition of output, and the performance in key sectors up to the 1980's was reasonable, the problems of structural imbalance in public finances have been noticeable

since the mid 1970's. The over all fiscal deficit remained in excess of 6 per cent of GDP until 1992-93 which was subsequently brought down to less than 6 per cent. The rapidly growing interest payments on high levels of borrowing in the early years, however, exerted a strong upward pressure on current expenditure which, overtime, has increased from 13.6 per cent of GDP in 1980-81 to 18 per cent of GDP in 1997-98. Increase in debt servicing and defence expenditure has kept public expenditure at a high level, i.e. 69.65 per cent of total expenditure in 1997-98 as against 42.7 per cent in 1979-80. As a percentage of federal revenues, such expenditure has increased from 64.56 per cent in 1979-80 to 78.48 per cent in 1997-98. This has led to the scaling down of public sector development expenditure from 0.3 per cent in 1980-81 to 3.1 per cent in 1997-98.

Improvements in resource mobilisation were observed until the year 1991-92. After that, it is a story of continual decline i.e. total revenues as a percentage of GDP went down from 19.1 per cent in 1991-92 to 16.1 per cent in 1997-98. The tax-to-GDP ratio declined from 14.3 per cent in 1988-89 to 12.7 per cent in 1997-98 (which is expected to further decline in 1998-99). While the Direct Taxes-to-GDP ratio, during this period increased from 2.2 per cent to 4.1 per cent, the Indirect Taxes-to-GDP ratio declined from 10 per cent to 7.5 per cent - the major decline being in customs duties. The ratio of non-tax revenues to GDP has, however, been moving up. In absolute terms, the increase in tax and non-tax receipts in relation to GDP was almost equal. The minimum target for the Tax-to-GDP ratio is to increase it by about one percentage point every year until it reaches 17 per cent of the GDP. Given the revenue performance during the July, 1998 - April 1999 period, no improvements are expected.

As to the level of total fiscal effort, wide divergence is observed between the federal and provincial governments. The federal Tax-to-GDP ratio has remained between 13 per cent to 14 per cent declining to below 13 per cent for 1997-98. The provincial Tax-to-GDP ratio, however, declined from 0.9 per cent in 1980-81 to 0.6 per cent in 1997-98. Several explanations have been offered for the poor performance, such as limited fiscal space and narrow and inelastic tax base. The gap between provincial expenditure and revenues has now become so wide that a radical rearrangement of taxation powers between the federation and the provinces is required.

In terms of international comparisons, the level of tax revenues in Pakistan is lower than developing countries with similar circumstances. Against the average Tax-to-GDP ratio of around 18.5 per cent in the case of several developing countries, Pakistan's Tax-to-GDP ratio is less than 13 per cent . Further, the share of direct taxes to the overall tax revenues in Pakistan has historically remained between 2.68 per cent to 3.8 per cent of GDP as

against an average of 7.2 per cent for other developing countries. On the contrary, for the same period, Tax-to-GDP ratio in respect of indirect taxes was around 9 per cent in Pakistan as against 5.2 per cent in the case of other developing countries. The ratio of direct and indirect taxes in total tax revenues has, however, improved from 18 % : 82 % in 1990-91 to 35 % : 65 % in 1997-98. The overall cost of revenue collection has generally remained around 1 per cent for Pakistan which is modest in comparison with other developing countries.

The extraordinary performance in direct taxes is largely due to the extension of the withholding tax regime during the 1990's. Payments accompanying corporate tax returns have also continued to grow despite some fall in tax rates. Major additions in revenue were observed in 1997-98 consequent to the change in the basis of computation of quarterly advance income tax payments under Section-53 of the Income Tax Ordinance, 1979 through the 1997 Budget. Tax receipts under this head improved by around 104 per cent during 1997-98. On the contrary, reforms i.e. indirect taxes by way of reduction in the maximum tariffs and the resort to capacity taxation and fixed sales taxation have led to a loss in revenues. The broadening of the tax base of excise duties by its extension to telephone and banking services has only partially compensated for these losses.

The tax base for most of the taxes in Pakistan has been growing faster than the GDP, particularly in respect of direct taxes and sales tax. However, these tax bases have not been captured fully and the effective tax bases remain narrow and skewed. Thus, even though the buoyancy of the tax system has increased over time, the tax revenues have not grown adequately (partly due to distortions in tax policy and partly due to the failure of tax administration) As a consequence, the low elasticity coefficient remains depressed.

In looking at the reasons for low elasticity of taxes, it is observed that high tax rates, pursuit of secondary economic and social objectives (through a variety of tax concessions), non-taxation of agricultural incomes and an inefficient tax administration contributed towards the low elasticity in direct taxes. The story has been repeated in the case of indirect taxes, especially import duties. The introduction of fixed sales tax in some industries tended to reduce the elasticity of GST. On the contrary, the levy of *ad-valorem* taxes of capital incomes (which are growing relatively rapidly in the economy), the extension of *ad-valorem* excise duties to services such as telecommunication and the switch-over from specific to *ad-valorem* duties are some of the factors responsible for the enhancement in the elasticity of the taxation system. It is of interest to note that tax expenditure due to exemptions from direct taxes and custom duties for the year 1990-91 has been estimated at around 116 per cent and 55 per cent of the total

revenues respectively. Tax expenditures related to excise duties are relatively limited, although the study carried out by the Resource Mobilisation and Tax Reforms Commission shows that the tax expenditure on cottage industries amounted to over Rs. 3.2 billion in 1991-92.

The taxation reforms still do not focus adequately on efficiency. While the fixed taxes on agriculture and on capacity in industry, reduction in maximum tariffs and introduction of a VAT type of sales tax, particularly its extension to the retail stage, is likely to improve efficiency in industries and contribute to a better allocation of resources, the process of reforms still being in the implementation phase, it is not possible to assess its contribution to greater efficiency.

Concerning the 'progressivity of the taxation system', the increase in the share of direct taxes in federal tax revenues from 18 per cent in 1991-92 to over 35 per cent in 1997-98 has, to some degree, contributed to greater progressivity of the tax system. It is, however, important to note that the switch-over from several withholding to fixed taxes in the form of presumptive taxes has imparted the features of indirect taxes to the major component of direct tax. The fact that almost 40 per cent of income tax receipts are collected via presumptive taxes and are passed on to the consumers as cost, substantially dilutes the progressivity element. The progressivity of the tax burden may have further deteriorated with the levy of minimum tax under section 80 D of the Income Tax Ordinance, 1979 and the enhanced probability of selection for the tax audit of small taxpayers in the self assessment scheme. Relatively low revenue increases out of the tax audit of corporate and personal income returns, coupled with reduction in income tax rates, has benefitted the upper income groups. The introduction of the scheduler basis of income taxation in respect of most investment ('passive') incomes and several business incomes, has rendered the taxation system less neutral.

While examining the sectoral incidence of taxes, the studies conducted by the Resource Mobilisation and Tax Reforms Commission for 1990-91 indicate the highest effective tax rates on cigarettes and tobacco (86 per cent), perfumery and cosmetics (48 per cent), beverages (46 per cent), soaps and detergents (42 per cent), electrical machinery (38 per cent), tea blending (35 per cent) paints and varnishes (34 per cent), cement (33 per cent), silk and synthetic textiles (27 per cent) and gas (27 per cent). Most of these sectors were subject to excise duties. The sectors which were found to be relatively under-taxed relate primarily to agricultural and services activities, catering to the upper income group. This discrepancy reflects lack of horizontal equity.

In terms of incidence of taxation by household income, the studies reveal that in 1990-91 the overall burden of federal taxes was regressive upto a household monthly income level of Rs. 4,600/-. It became somewhat progressive on higher incomes because of income tax payments by upper income households. On the contrary, import taxes and excise duties were found to be markedly regressive. The incidence of sales tax, by and large, has been neutral with respect to the level of household income. Overall, the indirect taxes are significantly regressive and the tax burden was found to be around 13 per cent on the lowest income groups which fell to less than 9 per cent for the upper income group. Given the continuation of the same pattern of taxation more or less, there are reasons to believe that the equity aspect of taxation, as observed for 1990-91, has undergone no significant changes.

While the tax bases have improved overtime, the effective tax bases continue to be narrow and skewed. Tax compliance remains low in almost all taxes. Major revenue leakages have been observed both in direct and indirect taxes. Smuggling of goods on a massive scale continues unhindered from the established sea and land routes. Quantitative mis-declaration of imports are also very common. Evasion of sales tax, particularly at the manufacturing and whole-sale stage, is rampant. The compliance level for direct taxes is extremely low. For the assessment year 1998-99, only 9,781 corporate tax returns were filed out of around 40,000 companies registered with the Corporate Law Authority. Similarly, around 600,000 income tax returns were filed by around 2.5 million persons engaged in business, professions and vocations. 300,000 wealth tax returns filed for the assessment year 1998-99 represent no more than 20-25 per cent of the persons otherwise liable to wealth tax. A large number of transactions subject to withholding taxes and capital value tax escape such taxation for reasons of misdeclaration and/or inadequate monitoring. This explains the existence of a vast underground economy which was estimated at Rs. 1,115 billion in 1996. Sarfraz and Zafar have estimated the total tax evasion for 1996 at Rs. 152 billion. It has also, however, been observed that incomes from underground activities in the foreign trade tax sector have been higher than the domestic tax sector and non-tax sector and that the evidence suggests that the rate of growth in the black economy has been higher than the rate of growth of the formal economy.

Salient features and structural problems of the taxation system

Under the Constitution of Pakistan, 1973 the federal government is empowered to levy and collect

i) Taxes on income other than agricultural income, workers' welfare fund.

ii) Taxes on capital i.e. wealth tax, capital value tax, capital assets tax.

iii) Customs duties on international trade.

iv) Excise duties on goods and services (excluding duties on alcoholic liquors, opium or other narcotics)

v) Sales tax on imports, production and sale of goods.

Provincial governments are empowered to levy and collect taxes in respect of items other than those reserved for the federal government. These taxes include water tax, tax on trade and profession, stamp duty, duty on excises not included in the federal excise duty, electricity duty, entertainment duty, taxes on motor vehicles, tolls on roads and bridges, urban immovable property tax, betterment tax, capital gains tax, taxes on cinemas and hotels, and arms licence fees, court fees, cotton fees and various cesses. The provincial governments are not authorised to assess and collect entertainment tax and urban immovable property tax in cantonment areas within the provinces.

Local bodies such as municipalities, district and local councils may levy and collect taxes falling in the jurisdiction of the provincial government subject to the prior approval by the provincial government. The list of taxes, rates and fees leviable by the local bodes is given in the Local Government Act which includes the urban immovable property tax, taxes on value of land, animals, toll taxes and octroi duties.

The most noticeable dimension of the taxation powers under the Constitution is that the provincial taxation powers relate to low tax bases. Even where the provinces have the powers to tax certain products, the federal government has at times encroached upon their jurisdiction. The obvious examples included capital value tax and excise duties on services instead of sales tax which was part of the divisble pool.

As part of its macro-economic reforms in recent years, the GOP has focused its attention on improving the tax efforts, thereby reducing the resource gap. The key element of the tax reform programme includes broadening of tax bases, phasing out tax exemptions, conversion of specific rates of excise duty to *ad-valorem* rates and their extension in the service sector, reduction in tax rates and tariffs, conversion of sales tax to a broad based value added tax and its extension up to the retail stage, and improvements in tax administration. While implementing these tax reform programmes, the GOP undertook several measures to increase tax revenues in an anticipated environment of a liberal and unregulated market economy in Pakistan.

The policy developments, particularly those which have created the structural distortions in the taxation system, are discussed in some details in the following paragraphs. Administrative constraints are also discussed. Key reform issues will be identified in the process.

Income Tax, Wealth Tax, Capital Value Tax

The income tax law has historically followed the global basis of taxation of income at flat rates for corporate income and progressive rates for personal income. The first major distortion in the income tax law and policy was introduced in 1990 through fixed taxation for smaller tax payers. The tax payers, however, did not respond favourably, notwithstanding its simplicity and low tax rates. Hence, this concept was discarded. The next major conceptual distortion in the taxation system arose in 1991 with the introduction of the scheduler basis of taxation and conversion of some of the withholding taxes to presumptive taxes. The net of withholding and presumptive taxes expanded overtime with the result that presently more than two dozen economic activities are subject to these taxes as against 11 in FY 1990-91. Altogether, presumptive taxes constitute around 40 per cent of the total income tax receipts. The third distortion was introduced through the 1997 Budget by changing the basis of computation of tax prepayments u/s 53 of the Income Tax Ordinance, 1979, which added an equivalent amount of tax under this head to the tax receipts for 1997-98. The sum total of these distortions was that during 1997-98 over 86 per cent of the income tax receipts were generated via with-holding/presumptive taxes and advance tax payments, 4 per cent from payments accompanying corporate tax returns, and 2.5 per cent from payments along with non-corporate tax returns. The policy emphasis on prepayments as a major component of income tax receipts during the 1990s adversely impacted the tax audit functions, with the result that no more than 7.5 per cent of tax receipts were generated consequent to tax audit. Audit of non-corporate tax returns contributed around 0.2 per cent to the total income tax receipts. The reduction in tax rates, particularly the non-corporate tax rates, has not improved tax-compliance. Exclusion of agricultural income from the federal income tax base has not only diluted the effective income tax bases, but also served as an instrument of tax-evasion and avoidance. Continuation of liberal tax exemptions has also contributed to the regressivity of income tax.

Generally, wealth tax has not been considered as a major source of revenues. Until 1994, wealth tax was levied only on non-agricultural assets. Self-occupied residential houses (in lieu of Rs. 1 million basic exemption) and assets created through foreign remittances were/are exempt from wealth tax. Wealth tax was extended to agricultural assets through the 1994 budget. The legislation provided for separately taxing agricultural and non-agricultural assets

with a Rupees one million exemption limit for each. Buildings appurtenant to agricultural land and motor vehicles were excluded from the taxable base. Produce Index Unit was adopted as a basis of valuation for agricultural land. Separation of agricultural from non-agricultural assets for wealth tax purposes has not only compromised progressivity and equity of the taxation system, but also contributed no more than Rs. 6.7 million to the revenues. Valuation basis of taxable assets is questionable, particularly for the immovable properties as it is based on values adopted for the purpose of stamp duty rather than the market value. Minimum wealth tax on plots, buildings and motor vehicles introduced through the 1997 budget on a notional basis, is debatable. The methodology for collection of pre-payments via advance taxes is inefficient as it leaves much to the voluntary compliance of tax payers.

Capital value tax, in its present form, has very limited scope as it applies only to the transfer of immovable properties, air tickets and imported/old motor vehicles. Tax collections are a direct function of the valuation basis and monitoring arrangements. Since July, 1997, CVT is adjustable against wealth tax payments which further reduces its efficacy as a revenue generating instrument. Notwithstanding that CVT collections increased by over 110 per cent during 1996-97 and remained at the same level inspite of across-the-board 50 per cent reduction in CVT rates in 1997-98, it can not qualify as a major source of federal revenue.

The present organisation of the income tax and wealth tax department, in its relatively well-defined form, has successfully performed over the years. In an environment of shifting emphasis on withholding taxes and other pre-payments as a major means of revenue collection, the advantage of a traditional administrative organisation under which a tax unit encompasses all tax-related functions, has become a disadvantage in the handling of diverse functions. The specialised character of trade and industry no longer permits the handling of tax audit by generalists, as it requires trade and industry specialisation. Similarly, the system and procedures for the filing of tax returns, assessment and payment of taxes, record keeping, monitoring of withholding taxes and other pre-payments, booking of tax-defaulters, and access to market information are inefficient and time consuming. The use of automation is limited to the data-entry of tax-payment *challans* and simple tax computation of salary and business tax returns. A management information system for better tax audit and the expansion of effective tax bases is not in place inspite of around Rupees one billion investment in the computerisation of the CBR.

The practice of the same tax unit having jurisdiction over income tax and wealth tax returns has led to a lopsided emphasis on the former at the expense of wealth tax returns, which can be a major source of additional revenues. Similarly, the allocation of personnel dealing with corporate and non-

corporate income tax payers has historically been disproportionate to their revenue generating capacity. The selection basis for tax-audit continues to be random balloting rather than an objective parameteric approach based on some kind of discriminant functions. Coupled with inadequate tax audit skills, such a selection basis has rendered the tax audit function marginally effective.

There is no well defined monitoring arrangement for the capital value tax. CVT collections, being no more than 1.5 per cent of the overall direct tax revenues, the assessing officers are not expected to make much contribution in this regard unless major functional re-arrangement is made.

In brief, the department lacks the requisite professional specialisation otherwise available to most of the tax administrations in developed countries. This situation is definitely not expected to enable the department to capture the increased tax bases.

Central Excise Duty

Central Excise duties are charged on selected commodities and services. Commodities are charged advalorem duties on value, specific rates based on weights/volumes, and as a percentage of the retail price. Services are charged to advalorem duties, and/or on charge basis. The concept of capacity taxation is very limited as of now. More than 70 items are subject to excise duty but a handful of these items; i.e. cigarettes, cement, sugar, natural gas and petroleum products, telephone services, and beverages are the major duty spinners contributing around 70 per cent of tax revenues. There are immense leakages of excise duties both with respect to supervised and non-supervised clearance of goods and services. The latter are particularly prone to tax evasion. Revenue leakages are primarily due to malpractices and the collusion of central excise officials with taxpayers, their complacent attitudes and lower-than-optimal tax audits, particularly in respect of services, lack of integrated data base on the manufacture of taxable commodities/services and over-reliance on the major duty spinners.

The Central Excise Department continues to have a narrow focus only on major excise duty spinners. A large number of small excise duty contributors and services remain inadequately attended notwithstanding that their large tax bases can be converted into effective tax bases. The composite Customs and Central Excise Collectorates have the in-built disadvantage of attending more to customs functions rather than excise duties. The staff assignment at units other than major excise duty spinners' as well as those monitoring the services sector, are considered less preferrable and the staff spend most of their energies on their transfer to greener pastures.

Customs Duties

The existing structure of levies on imports is fairly complex. The basic duty structure is supplemented with a host of SROs allowing general/specific exemptions. The overall effect is neither visible to the economy nor do they serve as indicators for correction to policy makers. Cumulatively, tariff and paratariffs create substantial distortions in the structure of tariff schedules. The duty concessions/exemptions lead to substantial reductions in the tax base and provide opportunities for mis-characterisation of dutiable goods in the tax-exempt/low duty regimes. Tariff reforms initiated in recent years have not led to a surge in dutiable imports. On the contrary, it has resulted in a reduction in revenue collection. The major areas of tax leakages are ineffective anti-smuggling efforts, mis-declaration of quantities and value of imported goods, mis-characterisation of goods to benefit from lower duties under PCT and, of course, collusion of customs officials with importers.

Major administrative problems orbit around the anti-smuggling efforts, valuation of imported goods, quantitative misdeclaration of imports, management of ware houses, classification of goods for the assessment of custom duties and the collusion of custom officials with the importers. The job specialisation recently initiated in the Customs Department is capable of producing positive results. The general perception is that customs duty collections are a function of value-quantities of imports and the effective duty rate is disputed, particularly because the factors mentioned above also strongly influence revenue collection.

Sales Tax

The sales tax regime in its present form is restrictive in so for as it applies to the retailers. The narrow base leads to frequent breaks in the production - distribution - consumption chain. A wide range of exemptions, including the linkage with annual turnover in case of retailers, provide adequate room for tax evasion. In the presence of such exemptions, zero-rating of exports is not possible. Similarly, verification of the precision of transaction values is also difficult. Inadequate institutional capability and absence of full political support which leads to the government succumbing to the pressure of trade associations, has handicaped implementation of the GST. The recruitment of audit personnel has been inordinately delayed and shortages of required funds frequently observed. Taxpayers' education/ assistance programmes are inadequate.

In the years to come, GST is expected to be converted into a consumption type VAT encompassing purchase/sales transactions at all levels and all commodities and services (Constitution permitting). The scope of

work is, therefore, going to be immensely increased, particularly with respect to activities other than the collection of sales tax at the import stage. The present level of political and administrative support is grossly insufficient to muster the full advantages of GST, both in terms of tax collection as well as help in creating the necessary data base to improve direct tax efforts.

Key Issues in Tax Reforms

The key issues in tax reforms which emerge from the foregoing analysis concern both tax policy and tax administration. While equity and progressivity of the taxation system are important considerations, resource mobilisation appears as the most important item on the government agenda. As part of ESAF/EFF arrangements with the IMF, the government is committed "to achieve a significant enhancement of the revenue effort while promoting a more equitable distribution of the tax burden and greater documentation of the economy. To this end, the tax base will be broadened by including un-taxed income and under-taxed sectors, and the tax administration improved in order to provide scope for a lowering of statutory tax rates. Further, administration of the GST in the textile sector will be improved and the GST extended to services, petroleum products, electricity and agricultural inputs. The government will fully implement agricultural income taxation and ensure the achievement of the 1998-99 budget revenue target of Rs. 2.5 billion. An action plan will be developed to strengthen the system of agricultural income taxation which will broaden the base as well as increase the rates. Revenues from agricultural income taxation are targeted atleast at 0.3 per cent of GDP over the medium term. Reform of the tax administration will aim at improving taxpayer compliance, reducing compliance costs and broadening the tax base in order to achieve a sustained growth of tax revenue. The CBR will be converted into an independent and autonomous Pakistan Revenue Service (PRS) and a comprehensive institution building programme for the PRS will be implemented with the assistance of the World Bank. The introduction of a unique tax identifier number which will replace all previous numbering systems in use in the tax and customs administration will be completed by May, 1999 and will form the basis for the harmonisation of the operations of the major tax departments. The number of registered taxpayers will be increased to 1.6 million by December 31, 1998 and to 1.8 million by May 31, 1999. The number of GST non-filers will be reduced to 10 per cent by June 1998. To strengthen the audit function within the CBR, the separate audit department established in the CBR will develop a joint audit programme for all tax liabilities which will cover 10-15 per cent of taxpayers by September 1999 and 20-25 per cent by December 1999."

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Book Review

Ishrat Hussain, *Pakistan - The Economy of An Elitist State,* Oxford University Press, Karachi. 1999 pp 451, Price: Rs. 550/-

Ishrat Hussain, a former Pakistani civil servant and currently a World Bank official, has been writing on Pakistan's economy for the national print media. Much like the professional economist that he is, his views reflect an objective approach to a vast range of economic issues. It was now time for him to correlate his analysis of individual problems and sectors to a macroeconomic framework and make some sense out of Pakistan's baffling styles of economic management. How could a compact economy with a rich resource endowment be reduced to the position of a basket case?

Hussain's hypothesis: a small group of elites managed to "hijack the state" and "rig the market" for its own exclusive benefit. The "Elitist State" now controls both the private and public sector. No matter which way the economy turns ___ market mechanism or state control ___, the goodies will inevitably land, and are actually landing, in the hands of the controlling elites.

It is no surprise thus that the regimes, whether relying on state or market, are characterised by a similar lack of integrity and the same type of management lapses.

Hussain adopts a somewhat unorthodox arrangement of his material in support of this hypothesis. The study looks first at the 'Production Base' (commodity sectors), followed by 'Macroeconomic Foundation' (Fiscal and monetary issues), 'Investing in People' (social sectors), 'Physical Capital' (infrastructure), and Foreign Trade, External Debt and Resource Flows.

The author then takes the readers, in chapter 7, to an appraisal of the overall economic performance. This arrangement facilitates a better understanding of the paradoxes, which marked "the economic and social outcomes in Pakistan over the last 50 years". It reminds one of Alfred Hitchcock films, guiding the viewer frame-by-frame and scene-by-scene through different stages of the story, building up suspense, unraveling the mystery only in the last scene. In this book the climax comes in chapter 7. Ishrat Hussain's analysis and conclusions are intellectually stimulating.

The pattern of growth, the author says, is as important as the speed of growth. Greater equality in wealth, human capital and political power is likely to promote broad and deep markets, and technological change. He looks at Pakistan's performance in the light of domestic variables (which also

include policy and institutional factors) and also external shocks and resource flows, which, he says, have played a more favorable role in the case of Pakistan. He mentions foreign aid in the 1960's, remittances in the 1970's (and the 1980's), and the Afghan war in the 1980's. (Why, the reader is tempted to ask did we land in fiscal deficits, the financing of which domestic debt increased by almost five times, besides a 50 per cent increase in foreign debt during 1980-88, sending Pakistan into the debt trap?

Ishrat Hussain also raises the question of the roles of the state and the market. Ideally, any failures in the market mechanism should be corrected by cautious and judicious interventions by the state. Thus there should be a complementary relationship between the two, and not an adversarial one.

But in Pakistan rent earning classes in the form of tax-exempt big landowners and subsidies - rich large-scale industrial owners were given all the opportunities to multiply their gains. Landlords received the benefits of Green Revolution technologies and liberal input subsidies. Industrialists were protected by import substitution policies. While Bhutto hurt private sector interests by nationalising key sectors (with disastrous results), Zia tried to appease them by offering liberal loans, and his own political cronies, by way of patronage. Income distribution remained a matter of little importance. Small farmers and small businessmen were ignored by the financial sector and the government. In a non-competitive market, a pattern of maldistribution was set and supervised by the arbitrary exercise of political power. The Elitist State had arrived.

Social sectors? Poverty alleviation? Well! Elitist states tend to flourish under conditions of low literacy, inequalities, monopolies and paternalistic politics. That such situations also create social tensions, suspicions, lack of trust between classes and regions is a matter of little concern for the elites. Foresight is not a defining feature of the thoughts of the elites.

The last two chapters, An Economic and Social Agenda for the 21st century and 'The Epilogue', to this reviewer, appear to represent an anti-climax. With the current socio-economic situation dominated by the crushing burden of national debt and economic sanctions, the outlook is hazy; any perceptions, therefore, of the future course of events is as difficult as, say, playing cricket under foggy conditions.

The 21st century agenda is long, drawn as it is from the failure of the last 50 years. But the author selects three key areas for the revival of institutions: the judiciary, education and the financial sector.

Two more points merit attention. Hussain refers to "excessive dependence of the people of Pakistan on the government", which is a legacy of the colonial heritage. He cites the example of the Edhi Trust which "illustrates the enormous potential of private initiative in social and other services". Not so simple. The colonial era is dead. But the colonial practices have been remodeled to serve the elitist state. One wishes the author had checked with Edhi or read his excellent biography by Tehmina Durrani to gain some insight into the stresses and strains suffered by him and the risks he has had to face. At the time of writing, I understand, Edhi was in London.

Hakim Said built the largest network of non-profit social service institutions in this country purely on "private initiative". Where is Hakim Said now? The corrupt establishment, whatever its composition at any given point of time, cannot let the private initiative survive unless their dues are paid.

Hussain's optimism about privatisation also seems to be misplaced. What dynamism could privatisation of banks and DFIs introduce in the economy? Already 96 units including three banks, DFIs, a power unit, and industrial and commercial concerns, mostly during 1991-93, have been privatised. What dynamism has the new management generated in these five years? What exceptional financing has been generated in the form of their sale proceeds to ease the debt situation or the fiscal deficit?

Written in a flowing, easy style, this book is bound to provoke much discussion and should open new vistas of thought. The fresh approach that Hussain brings to the study of the economy of Pakistan should enable us to know ourselves better. Also, this is not a book for economists alone. It is meant for a much wider readership.

OUP, the publishers, need to be complimented for their ability to find authors of high quality for very challenging themes. Like their earlier publications, this book also is well edited and aesthetically presented.

Lahore School of Economics
Lahore

Viqar Ahmed

Book Review

Anirudh Krishna, Norman Uphoff and Milton J. Esman (Eds). *Reasons for Hope: Instructive Experiences in Rural Development*. Sage Publications. New Delhi. 1998. vii + 322pp. Indian rupees 250 (Pb).

The development of rural areas is now becoming one of the major objectives of government policy in less developed countries. It has become part of policy simply because governments in developing countries are beginning to realise that to tackle poverty effectively, and to reduce the pressure on urban centres, income levels, as well as the quality of life in rural areas has to be made significantly attractive to prevent people from migrating to the relatively higher income urban areas. Rapid urbanisation in many developing countries has resulted in increased social stress which is reflected in high crime rates, and a substantial decline in social services such as education and health, water supply and sanitation, electricity and housing, etc. The developing countries in Africa, Asia and Latin America are afflicted with both problems - rural poverty/environmental degradation and a rapidly urbanising sector that is estimated to double every twelve to fifteen years.

Western perspectives on the third world, that is the developing countries, can be categorised into two broad schools of thought - one optimistic that they can achieve a developed status through economic liberalisation and export promotion. The other being pessimistic that if this is not achievable the developing world would collapse under the adverse impact of growing populations, environmental degradation, ultimately leading to civil disorder. These are two extreme views which the editors of this volume say do not reflect reality, as they are simplistic. They support their view point by citing eighteen case studies on rural development. These eighteen case studies reflect the world's most successful rural development success stories. Region-wise there are seven case studies from South Asia, three from South East Asia and four each from Africa and Latin America. The case studies have different emphases, some deal with multisectoral development; others are limited to agriculture based development; a number deal with health, nutrition, family planning and water supply criteria whereas the fourth category discusses issues in agroforestry, watershed and wildlife management. To sum up, therefore, all these examples deal with different aspects of life in the rural areas. Of particular interest to South Asian students of development studies are the detailed presentations about the Grameen Bank in Bangladesh, the Orangi Pilot Project in Karachi, Pakistan, the Bangladesh Rural Advancement Committee (BRAC) and the Savings and Credit Cooperative Movement (SANASA) in Sri Lanka.

Having perused these case studies, one concludes that there is a reasonable chance that the developing countries would be able to overcome their many problems. The thrusts for development are very evident and with the right amount of enlightened political will, combined with consistent and supportive economic policy, developing countries can forge ahead. However, a word of caution is necessary. This volume deals with only eighteen case studies - may be these are the better known ones. One does not know how many unsuccessful instances there have been - supposedly that would fill several volumes. Again, successful case studies are only that - case studies. For wider adoption other issues come into play and case studies that are successful in one part of a country may not be suitable in another part. It is important, therefore, to identify the factors that make for successful development projects. Blind replication of case studies, no matter how successful, can give rise to problems if local, regional and national conditions are ignored by being not properly factored in.

To conclude, this volume has been well edited and is a pleasure to read. It is easily accessible to the general reader and that is what all good academic work should address. The information presented in this volume can serve as benchmarks for future research in similar and related fields.

Pakistan Institute of Development Economics, Islamabad

Mir Annice Mahmood

Book Review

Parvez Hasan, *Pakistan's Economy at the Crossroads: Past Policies and Present Imperatives;* Oxford University Press, Karachi, 1998, pps. 376, price not mentioned.

This is a highly readable book on the Pakistan economy. The bulk of the book spans the entire gamut of Pakistan's economic phases, setting out with the initial years (1947 - 1958), followed sequentially by the Ayub Khan, Bhutto and Zia eras, then leading up to the Benazir and Nawaz Shariff periods. It concludes on prognostications for the future, which is really in my opinion, the most valuable part of the entire book.

In essence, the author highlights the fairly long years of 'impressive growth' with the vulnerability of present circumstances. The emphasis is throughout on economic policy issues, with useful explanations sprinkled here and there on the whys and wherefores of successes and failures. The author both lauds and castigates Pakistan's growth record, amply substantiating his argument in either case. What is sorely lacking in the country's growth scenario is sustainability and equitable distribution of benefits. He probes the question as to why this remarkable growth has been so skewed. In discussing the country's abysmal savings rate, he says in categorical terms that it was not owing to capital flight as is commonly assumed, rather negative real returns on bank deposits, inadequate development of capital markets amongst other factors are the real reasons for this relatively massive capital flight. What has added salt to the wound is the political indifference of those at the helm of affairs in this regard, according to the author.

There is no aspect of the economy which the author misses out on. Providing in depth accounts of defence spending, budget deficits, taxation effort, foreign trade developments, agriculture and large scale manufacturing from a historical and analytical perspective to boot, the author is extremely thorough and meticulous in his analysis. He attributes the persistence of widespread poverty to mediocre economic policies, and had these been of a higher standard and of better quality, the author feels that not only would growth have been higher, but more equitable.

The author warns of the hazards for the future of the economy resulting from the poor quality of education at all levels. Ringing the tocsins of alarm, he states future growth is now under threat and the past pattern of development will simply not suffice.

The author is clearly, and quite justifiably, an advocate of Indo-Pakistan détente, for no other reason than more can then be devoted by the powers-that-be to development rather than defence. Yet another pearl of wisdom he gives is, to quote:

'Unfortunately, for Pakistan the emotive appeal of non-economic factors has at critical junctures often outweighed the cold economic calculus'. This in reference specifically to the non-devaluation decision of September 1949.

What is heartening is that in discussing controversial periods such as the Bhutto or Zia years, the author refrains from rhetoric as impossible as it may seem, though of course there is no such thing I firmly believe as pure objectivity, but merely *quasi* objectivity. There appears to be very little bias and the criticisms are on the whole fair and balanced. But, then again, perhaps that is because of the subject matter of the book-minus the frills of a political standpoint. Perhaps for that matter the book could have done with a little colour, since one score on which it can be criticised is that it is somewhat arid and sterile. It needs an infusion of debatable points to make it a little less tedious, One presumes, however that if you happen to be from the economics profession, it could grab your attention throughout.

All told, it is a happy blend of the historical and analytical. The contents are both insightful and perceptive. Having diagnosed the economy threadbare to date, the author proceeds to offer several viable alternatives at the conclusion of the book.

Lahore School of Economics **Nina Gera**
Lahore

Book Review

Saeed Shafqat (ed.), *Contemporary Issues in Pakistan Studies,* Azad Enterprises, Lahore, 1998. Pages: 270. Price: Rs. 300 (HB); Rs. 100 (PB).

This is the second edition of Dr. Saeed Shafqat's popular and well received book, the first edition of which came out in 1995. Pakistan studies has been an integral part of the country's educational syllabi and competitive examinations for many years now. Unfortunately the syllabi for our school, college and university students reflect a narrow definition of the subject. Not much attention has been paid to historical authenticity and accuracy of facts. The approach in general is simplistic and one is sorry to note, jingoistic. No wonder this discipline, whose importance cannot be overemphasised, fails to capture the minds and imagination of the young students and the level of perceptions manifested by its study are abysmally low. There is need to raise the tone and level of debate and to move beyond the Pakistan Movement to which this subject has largely been confined. Even here the treatment is by and large narrow and simplistic.

Dr. Saeed Shafqat, a distinguished scholar and presently Chief Instructor at the Civil Services Academy, has presented his own version of how Pakistan studies, as a discipline, should be designed. For him, the subject should reflect dimensions such as culture, value systems, physical configuration and contiguity, social groups and their interaction with each other, and strategic considerations.

The book under review, a collection of research papers by a number of scholars and researchers, is an attempt to promote this vision of the subject. It has turned out to be a model, which has received much acceptance in the relevant quarters. The educational establishment, like all establishments, is slow to come to terms with new ideas, concepts and realities. It will thus take some time before our universities adopt this particular model of Pakistan studies. But it seems that Dr. Saeed Shafqat's efforts in raising the intellectual level of the treatment of the subject and broaden its scope has not gone waste.

The second edition adds five more articles to the original twelve of the first edition. For a live subject such as Pakistan Studies, such frequent adjustments are necessary. This book is an invaluable source of knowledge for students who look for scholarly and critical analysis of contemporary issues.

Lahore School of Economics **Viqar Ahmed**
Lahore.

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