Journal of Social and Economic Development

INSTITUTE FOR SOCIAL AND ECONOMIC CHANGE
BANGALORE

Aims and Scope

The Journal provides a forum for in-depth analysis of the problems of social, economic, political, institutional, cultural and environmental transformation taking place in the world today, particularly in developing countries. It welcomes articles with rigorous reasoning, supported by proper documentation. Articles, including field-based ones, are expected to have a theoretical and/or historical perspective. The Journal encourages inter-disciplinary articles that are accessible to a wider group of social scientists and policy makers, in addition to articles specific to particular social sciences. The Journal also gives scope to Research Notes, Comments, Book Reviews and Review Articles.

All correspondence to be addressed to:

Journal of
Social and Economic
Development

Articles

Book Reviews

Books at a Glance 320-322

Child Labour in Developing Countries: The Role of Education, Poverty and Birth Order

Rasheda Khanam and Mohammad Mafizur Rahman*

Abstract

This paper examines the role of education, poverty and birth order with regard to child labour in developing countries. The higher the cost of education is, compared to benefit, the higher is the likelihood of a child being sent to work. Poor school facilities and poor quality of education ensure higher incidence of child labour. However, easy access to credit market, income transfer programmes to households and law of compulsory schooling affect child labour negatively. The link between poverty and child labour is inconclusive, though a positive relationship between these two variables is prevalent. The evidence also notes that older children are more likely to be sent to work than their younger siblings, though a few exceptions also exist in the literature. Girls' work participation is higher than the boys' work participation, and girls are more likely to participate in housework, while boys are more likely to participate in market work.

Introduction

The issue of child labour has attracted much global attention in recent years, though it is not a new phenomenon. It has been prevalent in the late eighteenth and early nineteenth centuries in Europe, especially in Britain during the Industrial Revolution, and from the mid-nineteenth century in America. Basu (1999) reports that according to the Census of England and Wales in 1861, 36.9 per cent of boys and 20.5 per cent of girls in the 10 to 14 years age group were working. Since then, there have been serious efforts to root out child labour from society. These initiatives are reflected in the 'Robert Peel's Factory Act' of 1802 (Basu and Tzannatos 2003) and in a series of other legislative acts including a compulsory Education Act. Enormous economic growth and prosperity in the nineteenth and early twentieth century have also led to a sharp decline in the incidence of child labour in

---
* Rasheda Khanam is with Australian Centre for Economic Research on Health (ACERH UQ), the University of Queensland, QLD 4006, Australia. Email: r.khanam@uq.edu.au; Mohammad Mafizur Rahman is with School of Accounting, Economics and Finance, the University of Southern Queensland, Toowoomba, ALD 4350, Australia. Email: rahman@usq.edu.au.

industrialised countries[1]. Although child labour has been abolished from industrialised countries, it has spread its roots in developing economies, where multi-class social structures exist and complex traditional and pre-capitalist production relations are operative.

The United Nations (UN) Convention on the 'Right of the Child' has underscored the need to protect children from economic exploitation and from any kind of work that is likely to be hazardous. Nevertheless, 126 million children have been reported to be working under hazardous conditions as of 2004 (ILO 2006a). The UN Convention on the 'Right of the Child (CRC)', increased globalisation, and systematic statistics of working children released by the International Labour Office (ILO) and the World Bank, however, have increased awareness about the issue and its effect on child development around the globe.

Despite the growing concern over the use of child labour in many export-oriented industries in developing countries, the use of child labour is more common in the rural informal sector, particularly in the agricultural and domestic service sectors. So it is important to identify the factors that play a role in causing child labour. Surveying the existing literature, we will explore the role of education, poverty and birth order in this paper.

The rest of the paper is organised as follows: Section 2 provides a brief picture of child labour worldwide. Section 3 discusses the factors responsible for child labour; the role of education, poverty and birth order is critically examined in this section. Finally, Section 4 summarises and concludes the paper.

A Picture of Child Labour

1. Definitions

It is difficult to define child labour, particularly because of societal and cultural differences across countries and different concepts of the 'child'. In the western world, a child is defined by his or her age, whereas in developing countries, a child is defined by his or her social responsibility (Rogers and Standing 1981). The age of a child and the nature of work, however, are to be considered as the main criteria for defining child labour.

A series of international conventions, particularly two major conventions, the UN Convention on the Right of the Child (1989) and the ILO Convention No. 138, have been used as benchmarks to define child labour. The ILO Convention 138

---

[1] Fallon and Tzannatos (1997) reported that child labour declines quickly as low-income countries grow, but among middle-income countries it stabilises more or less until a certain level of higher income is achieved. Technological change also played a great role in reducing child labour in western economies at the end of the nineteenth century (Moehling 1999 and Brown and Peter 1992).

provides the definition of a child and the minimum age of employment, while the CRC deals with the nature of work. The Convention No. 138 specifies 15 years as the age above which, in a normal situation, a person can participate in economic activities. The Convention specifies some special cases: for example, for 'light work', this age limit is 13 years, and for 'hazardous work', it is 18 years.

There is also a clear distinction between child work and child labour. Child work refers to those kinds of economic activities in which there is no economic compulsion forcing the child into employment. These activities include housekeeping, child-minding, helping and assisting adults for no pay on the family farm, in small enterprises and shops, domestic service, selling articles on the streets, running errands, etc.

These types of activities are regarded as training, helping and the socialisation process (Davin 1982). However, Andvig's (2001) view in this regard is somewhat different. He defines:

> *Child work* constitutes those activities performed by a child that contribute positively either to the output of a family or a farm or to the family's public goods and that the child considers as involving some scarifies. Output means not only output in the national accounting sense, but also the necessary input to the family's consumption and maintenance of its infrastructure. Hence, water collection for both humans and animals is defined as work, though the first does not contribute to national output in the traditional national accounting sense.

On the other hand, an economic activity can be classified as child labour if it affects a child's leisure, play, health and educational activities (Lavalette 1994). As Schlemmer (2000) mentions:

> ILO has tried to make a clear distinction between children working in socially and personally useful ways - working for pocket money, doing household chores, helping in the family business during the school holidays - and children whose working conditions should be regulated or eliminated. Working children at risk, according to ILO, are: children who are prematurely leading adult lives and working long hours for low wages, under conditions which are damaging to their health and to their physical or mental development (quoted from Black (1993).

The minimum age for light work in the labour market is set at 12 for developing countries and 13 for other countries. At this age, the child can do some outside work that does not hamper a child's school attendance and impede his or her health.

2. Estimates

Child labour levels are high in many developing countries. The accurate measure of child labour is, however, difficult to obtain, as there is no clear-cut definition of child labour according to international law. Children are often excluded from the official statistics. The minimum age for a child's employment into work also varies across regions. Therefore, the estimate of child labour would vary depending on how we define work, how we define a child, and how we collect data. Table 1 represents the minimum age for work and the compulsory education age for different countries.

Table 1: Labour Force Participation Rates, Minimum Age for Work and Compulsory Education Ages for Children in Different Developing Countries.

Region	Child Labour Force Participation		Minimum Age For Work		Compulsory Education
	Age Range	Rate	Basic	Hazardous	Ages
Asia	5-14	21.0			
Bangladesh	5-14	19.1	12-15	18	6-10
India	5-14	5.4	14	14-18	
Nepal	5-14	41.7	14	16	
Pakistan	5-14	8.0	14	14-21	
Philippines	5-14	10.6	15	18	6-11
Thailand	10-14	16.2	15	18	6-11
Africa	5-14	41.0			
Egypt	6-14	12.0	14	15-17	6-13
Kenya	10-14	41.3	16	16-18	
South Africa	10-14	4.3	15	18	7-15
Tanzania	10-14	39.5	12-18	18	7-13
Latin America	5-14	17.0			
Brazil	5-14	12.8	14	18-21	7-14
Guatemala	7-14	4.1	14	16	6-15
Mexico	12-14	17.3	14	16-18	6-14
Nicaragua	10-14	9.9	14	18	7-12
Peru	6-14	4.1	12-16	18	6-16
Europe	5-14				
Turkey	6-14	12.6	15	18	6-13

Source: US DOL (1998) as cited in Brown, Deardorff and Stern (2001)

According to ILO estimates of 2004, 317 million children were 'economically active' in the age group of five to 17 years, across the world, of whom 218 million could be regarded as child labourers. Out of 218 million, 126 million were engaged in

hazardous work. For the narrower age group of five to 14-year-olds, the corresponding figures are 191 million economically active children, 166 million child labourers, and 74 million children in hazardous work. The highest number of child workers in the age group of five to 14 years is found in Asia-Pacific (122.3 million) followed by sub-Saharan Africa (49.3 million) and Latin America and the Caribbean (5.7 million). While Asia has the highest number of child workers, sub-Saharan Africa has the highest proportion of working children (ILO 2006a).

Table 2. Children in Economic Activity, Child Labour and Hazardous Work (by Sex and Age Group), 2004

Sex & Age Group	Econom. Active Children (EAC) (000s)	Child Labour	Child Labour as per cent of EAC	Children in Hazardous Work (CHW) (`000s)	CHW as per cent of EAC	CHW as per cent of Child Labour
5-11	107,647	107,647	100	40,235	37.4	37.4
Boys	53,103	53,103	100	20,325	8.3	38.3
Girls	54,544	54,544	100	19,909	36.5	36.5
12-14	83,072	58,105	69.9	34,157	41.1	58.8
Boys	44,706	31,848	71.2	20,693	46.3	65.0
Girls	38,366	26,257	68.4	13,464	35.1	51.3
Total 5-14	190,719	165,752	86.9	74,392	39.0	44.9
Boys	97,809	84,951	86.9	41,018	41.9	48.3
Girls	92,910	80,801	87.0	33,374	35.9	41.3
Total 15-17	126,683	51,911	41.0	51,911	41.0	100
Boys	70,609	32,250	45.7	32,250	45.7	100
Girls	56,073	19,661	35.1	19,661	35.1	100
Total	317,402	217,663	68.6	126,302	39.8	58.0
Boys	168,418	117,201	69.6	73,268	43.5	62.5
Girls	148,983	100, 462	67.4	53, 035	35.6	52.8

Source: ILO (2006b): Global Child Labour Trends 2000 to 2004, Geneva.

However, there is a difference between an 'economically active child' and 'child labour', as per the estimate produced by the ILO. For example, the ILO treats a child as 'economically active' if the child has worked one hour or more in the reference week[2]. The definition of 'child labour' for those in the age group of five to

---

[2] According to the ILO, the work performed must be in the labour market and hence excludes non-labour market production, such as housework. Therefore, the definition of child labour by ILO is appropriate for studies of the formal-sector labour market, but it is too weak for explaining the work performed in the household sector.

11 years is synonymous with the 'economically active'; for those in the age group of 12 to 14, child labour consists of those who have worked 14 hours or more, but less than 43 hours non-hazardous work per week for those who have one hour or more hazardous work per week. Children in the age group of 15-17 years are generally allowed to work. However, if they are engaged in hazardous work, they are considered as child labourers. The global estimates of economically active children and child labour are summarised in Table 2.

ILO (2006a) also indicates that the number of child labourers in both age groups of five to 14 and five to 17 fell by 11 per cent over the four years from 2000 to 2004. The decline was observed among those engaged in hazardous work: by 26 per cent for the five-to-17 age group, and 33 per cent for five-to-14-year-olds.

Determinants of Child Labour

1. Education and Child Labour

Much of the vast literature on child labour has discussed the issue of child labour in connection with education. Connecting child labour with education seems very logical, as it has been discussed in the definition of child labour that an economic activity of a child can be classified as child labour if it affects the child's leisure, health and particularly *educational activities*. Therefore, it points to a normative view that every child, regardless of his or her background, should have the right to receive at least a minimum amount of schooling. This is because childhood is considered as the best time for the acquisition of education, so it should be devoted to the accumulation of human capital, particularly through formal schooling. Hence, any discussion of child labour will lose importance if education or schooling is not incorporated into it.

Costs and Benefits of Education

The parents' decisions regarding whether a child will attend school or work are influenced by the cost and benefits of education and job opportunities. Households incur direct costs (such as school tuition, books and supplies and school uniforms) and indirect costs or opportunity costs (such as time spent in the classroom, travel time, and schoolwork at home) from enrolling a child in school. The time allocated for schooling is input for education, which could otherwise be used for market work or home production, and, hence, time spent on schooling represents forgone income or gains to the household. Therefore parents take into account the direct cost as well as the opportunity cost of enrolling a child in school. A child will be sent to work if the cost of schooling is higher than the benefit. Schooling creates long-term effects that have effects on children; on the other hand the cost of education is incurred in the short-term and will be borne by the parents.

The cost of schooling may vary substantially between countries and within countries. For example, in a study on Bangladesh, Ahmed and Quasem (1991) observe a higher rate of school enrolment in a more developed village where better facilities were available. Similarly, in Tanzania, Akabayashi and Psacharopoulos (1999) reveal that in areas with a lower school concentration children worked longer hours. Therefore, poor school facilities, poor quality of education, and long and costly travel to school make it difficult even for middle-income households to send the children to school. On the other hand, even the poorest families can send their children to school in areas where good quality free education is offered (Grimsrud 2001). This explains why some studies fail to find an income effect in school participation rates.

In the case of Ghana, however, it is found that the cost of schooling can keep children away from school (Canagarajah and Coulombe 1997). The cost of education is also found to be a significant barrier to school enrolment and completion for Egyptian children (Datt, Jolliffe and Sharma 1997)[3]. In Zambia, Nielsen (1998) finds that the effects of reducing education expenses by K1000[4] would be an increase in school attendance by about three percentage points in rural areas and an increase in school attendance by less than 1 per cent in urban areas. It may also be the case that high costs of education push children in the labour market, so that they can afford schooling for themselves or for their siblings. The lack of a credit market for education in the developing countries makes the situation worse. Further, low or declining returns of schooling put extra pressure on households regarding the schooling decisions for the children, and the result may be that children are kept away from school to avoid educational costs.

In many poor countries, the school curriculum is likely to be irrelevant to practical needs, teachers are unqualified or inexperienced, the logistical supports are negligible, and classrooms are unavailable or very small compared to the number of students. As a result, quality education is almost absent, which discourages parents from sending their children to school. They consider school as a waste of time, as there is no guarantee of getting a job after completion of study. Rather, parents can financially benefit if the children work.

The elimination of child labour depends on the quality and relevance of education services. Sometimes formal education is, however, too stiff and rigid to meet the demands of poor children. Therefore, formal education should not be considered as the only option, it should have some flexibility along with other options, such as education and training. On the other hand, informal education is

---

[3] The Survey of Child Labour in Egypt (1991) also documented that 42 per cent of the families of working children think that school expenses are very heavy for them.

[4] An exchange rate of K420= US$1 is used in Nielsen (1998).

too flexible, with low-quality education that cannot ensure further education and training instead of literacy.

Easy and improved access to the credit market can significantly increase school attendance and reduce child labour, as has been found to be the case in Africa (Canagarajah and Nielson 1999). Income transfer programmes and targeting the households living below poverty line can help stimulate demand for education by reducing the cost of education.   For instance, a targeted subsidy has been found to be very effective in reducing child labour (Udry 2003). In the case of Bangladesh, Ravallion and Wodon (2000) find that a targeted subsidy is more effective for increasing school enrolment and attendance than in reducing child labour[5]. Hazan and Berdugo (2002) also suggest that the introduction of compulsory schooling over a given period and retributive taxation from adults to elderly people in the following period could be an effective strategy to eradicate child labour. They suggest this policy, as Baland and Robinson (2000) claim that if parents invest for a child's schooling in one generation, children might not compensate their parents in the next generation, as intergenerational contracts cannot be enforced. Retributive taxation can compensate parents for the forgone earnings of their children. Therefore, it has been found that an increase in the supply of education is not enough to ensure school enrolment; the demand side of education should also be targeted.

2. Poverty and Child Labour

There has been a continued controversy about the relationship between child labour and poverty. Child labour is traditionally viewed as a consequence of poverty[6]; however, recently a number of studies[7] have failed to find an inverse link between child labour and household income.

---

[5] In the case of Bangladesh, Ravallion and Wodon (2000) found that a targeted subsidy is not so effective in reducing child labour, as it is found to be effective to increase school enrolment and duration. In this case, increased school enrolment and school attendance may come at the expense of leisure instead of lasbour.

[6] A number of theoretical and policy-oriented works have established an inverse relation between child labour and household income. Theoretical studies include Ranjan (2001), Baland and Robinson (2000), Basu and Van (1998), Rogers and Swinnerton (2003), Swinnerton and Rogers (1999), and policy-oriented studies include Fallon and Tzannatos (1998) and some empirical studies, such as Amin, Quayes and Rives (2004) and Ray (2000b) and among others.

[7] See for example, Cartwright (1999), Patrinos and Psacharopoulos (1994), Canagarajah and Nielsen (1999), Bhalotra and Heady (2003).

Macro-Level Evidence of Poverty Hypothesis

At macro level, there is strong evidence that the economic development of a country has a negative relationship with the labour force participation of children[8]. This is evident from the high incidence of child labour in countries with an extremely low per capita GDP.

From an empirical analysis of Latin-American households, Dessy and Knowles (2001) document that child labour is negatively related to per capita GDP in the country of residence. They further reported that variations in GDP explain 68 per cent of the variance in child labour rates (2001). In this connection, using cross-country data, Krueger (1996) found that per capita GDP could explain 80 per cent of the worldwide cross-country variation in child labour[9]. In China, a sharp decline in child labour occurred in the 1970s, when GDP began to rise and has been so ever since (Basu and Tzanatos 2003). Thailand experienced an annual growth rate of 9 per cent, during 1985-1995, and the labour force participation rate of children aged 13 to 14 years declined from 37 per cent in 1990 to 21 per cent in 1993 (Tzannatos 2003). In the late 1980s and the early 1990s, Vietnam enjoyed a rapid economic growth of over 6 per cent per annum especially in the last decade (Edmonds and Turk 2002), and the probability that a child aged 6 to 15 years work dropped by 26 per cent between 1993 and 1998 (Edmond 2001). The positive relationship between child labour and household poverty (measured by expenditure) and the positive impact of economic growth in Vietnam on child labour is evident from Table 3. Table 3 shows that the probability of working for a child aged 6 to 15 years declines with each quintile in 1993 from 40 per cent of children from the poorest quintile to 24 per cent of children in the top quintile in 1993. The notable exception is working for the family business. Working in the family business increased between quintiles two and five in 1993. Edmonds and Turk's (2002) explanation of this trend is that households owning a business are more apt to be wealthy households, and households owning their own business are more likely to have their children contribute to that business[10].

---

[8] Krueger (1996) observed a steep cross-country negative correlation between GDP per capita and the labour force participation of 10–14-year-olds in 1995.

[9] See also Edmond (2001) who found that improvements in living standards could explain 94 per cent of the decline in child labour for households near the poverty line in Vietnam.

[10] In this connection, Cartwright (1999) noted that children in rural Colombia whose families operate a household enterprise are 8 per cent more likely to work than other rural children.

Table 3: The Probability of Child Labour Participation by Quintile[11] of Per Capita Expenditure in Vietnam, 1993 and 1998.

| Quintile[12] | 1993 | | | | 1998 | | | |
| | Outside | | Family | | Outside | | Family | |
	Work	House	Agriculture	Business	Work	House	Agriculture	Business
1	0.40	0.30	0.35	0.04	0.34	0.01	0.31	0.03
2	0.37	0.02	0.33	0.03	0.27	0.01	0.25	0.02
3	0.35	0.02	0.30	0.04	0.24	0.01	0.21	0.03
4	0.29	0.01	0.24	0.05	0.17	0.01	0.15	0.03
5	0.24	0.01	0.20	0.05	0.08	0.00	0.06	0.03

Source: Edmonds (2001), based on data from the Vietnam Living Standards Surveys.

The negative relationship between child labour and per capita GDP may, however, become less sensitive to further increases in per capita GDP[13]. Fallon and Tzannatos (1997) document that child labour decline is rapid as low-income countries grow, but among middle-income countries it stabilises more or less until a certain level of higher income is achieved. The labour force participation rate for children aged 10 to 14 years is around 30 to 60 per cent in countries with a per capita GDP of US$500 or less (at 1987 prices) and is around 10 to 30 per cent in countries with incomes between US $ 500-1,000 (Fallon and Tzannatos 1997).

The extent of child labour, however, can also vary across different economies with the same level of income per capita, depending on their income distributions (Tanaka 2003). Using a political economy model of majority voting, Tanaka shows that income distribution is a crucial determinant of the amount of child labour; if equal income distribution exists with the same income per capita, the equilibrium amount of child labour becomes small.

Micro-Level Evidence of Poverty Hypothesis

At micro level, household decision-making theory shows that child labour exists because it is the best outcome for the intolerable situation of a household. For example, Basu and Van (1998), in their theoretical study, assume that non-work

---

[11] The quintiles for both years of data in Table 4 are quintiles of expenditure per capita in 1993; hence, the same households are in the same quintile in both years.

[12] Quintile 1 indicates the lowest expenditure per capita while Quintile 5 indicates the highest expenditure per capita.

[13] Sedlacek *et al.* (2003) documented that in several countries of Latin America which are in the middle to middle-upper income categories still have child labour force participation rates that are almost similar to the world average.

of children is a 'luxury good' for the household. A household will send its children to work only if the adult income is below a certain threshold level, which is stated as the substitution effect. Ranjan (1999) shows that a combination of poverty and the unavailability of credit markets generates child labour in developing countries. In his theoretical model, he showed that banning of child labour could reduce the welfare of the poor households who intend to send their children to work. Wahba (2000) and Blunch and Verner (2000) support Ranjan's findings. Wahba's empirical study, using the 1988 Egyptian Labour Force survey, also supports Basu & Van's (1998) study.

An increase in the adult market wage tends to decrease child labour in developing countries, which is in line with the substitution axiom of Basu and Van. Wahba finds that a 10 per cent increase in the market wage rate of a man reduces the probability of work for a boy by 22 per cent and by 13 per cent for a girl.

Poverty and child labour are mutually reinforcing; when parents are poor, children must work, and not attend school, and then grow up poor (Udray 2003, abstract). In a poverty-prone society, child labour is abundant and fertility is high, therefore, income from child labour is essential for the survival of the household. Hazan and Berdugo's (2002) study also reveals that child labour is a consequence of poverty. They document that if the economy is in the early stage development trap, child labour is pervasive and fertility is also high.

Subsequently, if this trap can be broken, the economy reaches to sustained growth steady-state equilibrium where child labour is abolished and fertility is low. Households that are poor are much more likely to send their children to work, and child labour contributes to poverty in the next generation by reducing education.

Cigno and Rosati (2002) analyse the 1994 Human Development of India Survey, conducted by the National Council for Applied Economic Research of New Delhi, a multi-purpose nationally representative sample of 34,394 households. They find that the probability that a child will work full time falls as income rises, which is evident from Table 4. Table 4 shows the distribution of children by their activity status and household income quintile. The negative relationship between child labour and household income is confirmed by Tables 4 and 5. A study by Ray (2000b) for Pakistan and Peru has also established a positive association between child labour and poverty, and this association is much stronger in Pakistan than in Peru[14].

---

[14] Ray (2000b) observed a reverse picture of his previous study (Ray 2000a) that did not find a positive link between child labour and poverty.

Table 4: Work/Study Status of Children by Income Quintile in India, 1994.

Income Group*	1	2	3	4	5
Work Only	12.2	10.1	7.1	6.0	4.6
Neither Work nor Study	29.9	22	18.0	16.9	13.0
Work and Study	4.2	4.0	3.9	4.5	3.7
Study only	53.6	63.7	7.1	72.4	78.5

Source: Cigno and Rosati (2002), based on the 1994 Human Development of India
            Survey, conducted by the National Council for Applied Economic Research,
            New Delhi.

* Income group 1-5 indicates poorest to richest income quintile.

**Table 5: Work/Study Status of Children by Household Income per Adult
Equivalent in Zambia[15].**

	Expenditure per AE K [1] 0-1970	Expenditure per AE K 1970-3940	Expenditure per AE K 3940 - 5910	Expenditure per AE >K 5910
Work Only	17.3	9.4	3.7	1.4
Neither Work nor Study	22.1	19.2	14.6	10.2
Work and Study	6.9	6.3	2.8	2.0
Study Only	53.7	65.2	79.0	86.4

[1] An exchange rate of K420=US$1 is used in Nielsen (1998).

Source: Nielsen (1998) based on Priority Survey II for Zambia, Collected by the
            Zambian Central Statistical Office with Financial Support from the World
            Bank.

Similarly, Rahman *et al* (1999) note that poverty is the main push factor of
child labour in developing countries, especially in Bangladesh. A recent study by
Amin *et al* (2004a) also confirms the view for Bangladesh. Sakellariou and Lall's
(2000) findings for the Philippines[16] are also the same. Sakellariou and Lall find that

[15] Although this Table shows an inverse relationship between household income and poverty,
    however, this relationship does not hold as strongly when the choice of school attendance
    versus child labour is modelled econometrically, controlling other characteristics in Nielsen
    (1998).

[16] Sakellariou and Lall (2000) used the data from the 1991 Family Income and Expenditure
    Survey and the 1992 Labour Force Survey, conducted by the National Statistics Office of
    the Philippines.

the probability of working is five per cent higher for a child aged between eight to 17 years, whose family belongs to the lowest income quintile, while the corresponding number for rural areas is 8 per cent. Their study reports that the probability of working is lower in richer regions of the Philippines, such as Metro Manila. In contrast, Levison, Moe and Knaul's (2001) study in urban Mexico notes that a one standard deviation increase in the father's imputed log wages leads to a three per cent decrease in the probability of working, whereas a one standard deviation increase in the father's or mother's imputed log wages increases the likelihood of school specialisation by 8 per cent. Levison, Moe and Knaul employed a multinomial logit model to estimate the determinants of participation in work, school, both, and neither school nor work.

Using data from Urban Bolivia, Cartwright and Patrinos (1999) show that household welfare[17] is negatively related with child labour. Cartwright and Patrinos found that 12.6 per cent and 6.7 per cent of children aged seven to 17 years from households belonging to the lowest income quintile engage in wage work and domestic work respectively; the corresponding figures are 1.3 per cent and 1.2 per cent for the highest quintile, respectively. They find that an increase in household expenditure decreases the probability of work by 5 per cent and the probability for full-time work decreases by 35 per cent. Another study by Cartwright (1999) in Colombia shows that the total per capita monthly household expenditure significantly reduces the probability that a child will be engaged in market and domestic work. In the lowest income quintile, 5.6 per cent and 13.7 per cent of children aged seven to 13 years are engaged in market work and home care in rural areas respectively, the corresponding proportions for the highest quintile are 2.5 per cent and 6.8 per cent respectively. Their findings suggested that for a one per cent increase in household expenditure, the probability of work declines by 0.11 percentage points for a rural child and 0.19 percentage points for an urban child. All these findings are consistent with Basu and Van's luxury axiom.

Although there is agreement about the negative relationship between child labour and household income, this relationship is, however, likely to be non-linear, with larger elasticity at lower levels of income and lower elasticity at higher levels of income (Edmonds 2001; Cigno, Rosati, and Tzannatos 2002). For instance, Rosati and Tzannatos (2002) observe in Vietnam that the effect of household income on child labour supply in households belonging to the lowest income quintile is 10 times higher than for households in the highest income quintile. This implies that the negative effect of household income on child labour supply tends to be smaller if the household belongs to the highest income quintile.

---

[17] A natural log of monthly household expenditure minus working children's contribution is used as a measurement of household welfare.

The probable causes of positive relationship between poverty and child labour may be: (a) child labour may not be a good preference for parents such that as incomes improve, the family chooses to have children work less; (b) the value of the marginal contribution of the child's income decreases with diminishing marginal utility of income; so parents prefer less child work; (c) higher direct and indirect schooling costs are unaffordable for a poor family; so children go to work rather than school; (d) higher family incomes enables parents to purchase substitutes (a washboard, fertiliser spreader, or a combine harvester, etc.) for child labour, that lowers the return to child labour within the household.

Critiques of the Poverty Hypothesis

While the above-mentioned studies seem to confirm the negative relationship between child labour and household income and welfare (that is, negative income effect), there are some studies that find an insignificant income[18] or a positive coefficient for income variable[19]. The negative association between household income and child labour is, therefore, not always strong. Studies such as those by Coulombe (1998), Nielson (1998), Patrinos and Psacharopoulos (1997), Ray (2000a), and Sasaki and Temesgen (1999) deny poverty as the main determinant of child labour.

For example, Ray's (2000a) analysis in Pakistan and Peru shows that income and related variables do not have any negative effect on children's work input in Pakistan. He revealed that child labour is inversely related to the expenditure per adult equivalent in Peru, although the impact is small. He also used a dichotomous variable of 'poverty status' to measure the income effect on child labour that also turns up as insignificant both in Pakistan and Peru. He further indicated that rising adult female wages in Pakistan and falling adult male wages in Peru increase children's participation in the labour force, suggesting that adult male and child labour are 'substitutes' in the Peruvian household, while adult female and child labour are 'complements' in the case of Pakistan. Ray (2003) distinguishes between cluster-level and household-level poverty in examining the link between poverty and child labour[20]. This study also failed to find a strong link between poverty and child

---

[18] Studies that found insignificant income effects include Coulombe (1998), Sasaki and Temesgen (1999) and Patrinos and Psacharopoulos (1997).

[19] Studies that found a positive coefficient for income variables include Cartwright (1996) and Patrinos and Psacharopoulos (1995).

[20] Cluster-level poverty is measured by the proportion of households in the cluster of residences of the child that are below poverty line. The poverty status of the child's household is defined with respect to a poverty line that is set at 50 per cent of the sample median of the distribution of per capita household expenditure (1 if below the poverty line, 0 otherwise).

labour in the urban and semi-urban areas of Ghana. Poverty is, however, a significant cause of child labour in rural areas of Ghana. Ray, therefore, concluded that improved household prosperity seems unlikely to be an important factor that could reduce child labour in Ghana, particularly in urban areas. So, a dispute remains among academics about the relationship between child labour and poverty or household income.

The probable cause of positive relationship between child labour and family income may be that if rising income is associated with the labour market activities of children, child labour will increase; that is, if child labour is defined as wage work, then it might appear to grow with rising incomes.

While there is a very strong cross-country negative correlation between child labour and per capita GDP, the role of household income to reduce the supply of child labour, is, however, not very clear within household level in a community or in a society. Cigno *et al* (2002) argue that while low income tends to be highly correlated with relatively higher child labour supply, changes in income do not seem to generate a larger reduction in the child labour supply. Bhalotra and Tzannatos (2003) note that the impact of poverty or household income on child labour is not as large and universal as expected. Further, it is important to note that intergeneration transmission of child labour is also widely observed. Basu and Tzannatos (2003) used the term 'Dynastic Trap' to explain the intergenerational transmission of child labour. Emerson and Souza (2003) also provided empirical evidence on this issue. For example, if parents are silk workers, they are more likely to bring their children into silk work rather than to send them to school. In this case, poverty may or may not play a vital role. Therefore, concrete conclusion cannot be drawn without further detailed investigation.

3. Birth Order and Child Labour

The evidence shows that the birth order of a child has significant effects on child development and achievement. In developing countries where a large family is very common, birth order matters significantly, particularly if households have resource constraints. Because of resource constraints, intra-household allocation of resources can be different for different children, according to their birth order. Therefore, differences in distribution of resources among children have significant effects on a child's outcomes. A number of studies have examined differences in nutrition, educational attainment and earnings among siblings (see for instance, Behman and Taubman 1986; Lindert 1978).

Previous studies from developed countries showed that older siblings are at an advantage as against those born later. Hence, older children could be higher achievers, as parents devote more resources, time, and energy to them. However, there are counter arguments. Some argue that older birth order (being relatively younger) may be conducive for child outcomes. Parents may be better able to take

care of their later-born children; this is because parents may have simply matured over time and their child-raising skills may have been honed over time. Besides this, if parents are credit-constrained and their earnings schedules are upward sloping with age, parents would be financially better able to raise later-born children (Kessler 1991).

Since most studies from developing countries on child labour point out that child labour is the result of household poverty, then it is logical for a poor household to choose among children as to who should go to school and who should be in the labour force. As parents have to make a choice from among their children for schooling, the birth order of the child could be a potential factor affecting parents' decisions regarding school and labour force participation. This rationalism is particularly driven by the resource constraints and poverty of the household. The fact is that parents are not discriminating among children intentionally; rather they are forced to do so because of their socio-economic and cultural background. Therefore, whatever the reason, there is a difference in children's activities according to their birth order. However, the effects of birth order could be different in the context of child labour, particularly in low-income countries. Earlier-born children could be more productive, to command higher wages or be more able to do household work or farming activities because of their higher innate abilities (Emerson and Souza 2004). This could induce parents to choose their older children for work. Further, as a young family, when children are born, parents may not have sufficient income to send their earlier-born to school; as the earning schedule goes up with age. In addition, in a poverty-prone society it is unlikely that parents will have many opportunities for alternative earnings or achieve any assets by inheritance to enable them to ensure schooling for all their children. Therefore, parents choose their earlier-born children for work. There is also a societal belief that earlier-born children should take on more family responsibilities. Therefore, they are more likely to be chosen for work by their parents. When the household gets some income support from their earlier-born children then they are able to send their younger children to school.

The evidence shows that older children are more likely to work and the older the children are the higher will be their wages. Therefore, if parents have to send their children to work for subsistence reasons they are likely to choose their older children first. As child labour has a negative effect on education and future earnings, they may therefore have lower educational performance and earnings when they grow up, if they work or combine work with study. Therefore, birth order may have different effects on children from developing countries than on children from developed countries.

Using data from Bangladesh, Khanam and Rahman (2007) examine how the birth order of a child influences parental decisions to place children in one of four activities: 'study only', 'study and work', 'neither work nor study' and 'work

only'. Their results, derived from multinomial logit model, reveal that being a first-born child increases the probability of work as the prime activity, or at least a combination of school and work, rather than schooling only. That is, later-born children are more likely to be in school than their earlier-born siblings.

Using a longitudinal data set from the Philippines, Ejrnæs and Pörtner (2002) analysed the effect of the birth order of a child on its human capital. They also found strong evidence of birth order in both completed school and time spent on school activities. Their estimation results, however, revealed that later-born children receive more schooling than earlier-born siblings[21]. Examining the effects of birth order on an individual's earning possibilities, Kessler (1991) found no significant effects of birth order on an individual's achievements.

A model developed by Edmonds (2004) also documents that older children have comparative advantages in household production over their younger siblings; hence parents may choose to send older children to work while they send younger children to school. Also, older girls may be better at housework than their younger siblings, so they are more likely to work more than their later-born counterparts. Using data from the 1998/1999 Nepali Labour Force Survey, Edmonds (2004) documents that older female children work more than their younger siblings in Nepal. The older girl child in Nepal works on an average 2.6 hours per week more than any other siblings in the household, while the oldest boy only works an additional 0.04 hours per week. An increase in birth order (being relatively young) is associated with 2.8 hours' less work on average for Nepali girls and 2.2 hours' less work for Nepali boys. Edmonds (2003b) reports that in Vietnam, an increase in birth order is associated with 2.6 fewer hours' work for boys and 2.9 hours for girls.

Emerson and Souza (2002) explore the effect of birth order on child labour supply and schooling in Brazil[22]. They argue that earlier-born children are able to earn higher wages than their younger siblings. Also, due to capital market imperfection, a poor household might not be able to send its earlier-born children to school, but could send its later-born children, due to the income earned by their older siblings. The results from their empirical investigation suggest that first-born children are less likely to attend school than their later-born siblings and that last-born children are less likely to work as child labourers than their earlier-born siblings.

However, the opposite scenario is also observed. For example, Behrman and Taubman (1986) examine the effect of birth order on schooling and earnings.

---

[21] The empirical investigation by Ejrnæs and Pörtner (2002) showed that birth order is less pronounced if parents have higher education, while the effect is strong if the household owns more land.

[22] Emerson and Portela (2002) presented both a theoretical discussion and an empirical investigation of the relationship between birth order and child labour, using the 1998 Pesquisa Nacional por Amostragem a Domicßlio (PNAD).

They establish that there are differences by birth order in both schooling and in earnings for young adults[23]. Their study indicates that an increase in the birth order (continuous measure) causes a decrease of .26 years of schooling for males and .42 years of schooling for females. Their study observes that being amongst the later-born children increases the probability of less schooling, both for males and females.

Illahi (2001) find opposite results in Peru regarding birth order. Using panel data from Peru, he reveals that the younger child, particularly a boy, of a household is more likely to work. He documents that after age, birth order influences the decision to work of boys but not girls; also, as the sibling rank (that is, being relatively younger) of a boy increases, he is more likely to work.

Furthermore, it may be noted that while birth order influences child labour, the falling family size may also impact child labour. It can be assumed that the lower the family size, the lower will be child labour as families can afford to send their children to school.

Summary and Conclusion

This study differentiates 'child labour' from 'economically active children'. Further, a global estimate of economically active children and child labour has been provided. Next, the phenomenon of child labour has been discussed in relation to schooling, poverty and the birth order of a child.

The studies reviewed in this paper point out that there is a trade-off between child labour and schooling. Costs (both direct and indirect) and benefits from education are considered by parents in making schooling and child labour decisions. Evidence seems to support the view that the higher the cost of education is, the higher is the likeliness of a child to be sent to work. Other factors such as poor school facilities, poor quality of education, long travel to school and low return of schooling also contribute to child labour positively. However, easy access to credit market, income transfer programmes such as targeted subsidy to households and law of compulsory schooling affect child labour negatively.

The link between poverty and child labour is controversial. While there exists a very strong cross-country negative correlation between child labour and per capita GDP, the role of household income in reducing the supply of child labour, is, however, not as strong in explaining the variations within household income levels in a community or in a society. Therefore, the role of household income in determining child labour decisions needs further study.

The evidence also notes that birth order of a child also matters in terms of whether a child will be sent to school or work. The link between birth order and child

---

[23] However, they found that the effect of birth order on earnings becomes insignificant if family background characteristics are included as controls in the regression.

labour suggests that earlier-born children make schooling possible for later-born siblings. This is because earlier-born children are able to command higher wages than their younger siblings, which, in turn, helps to relax the liquidity constraint in the presence of capital-market failure. Therefore, earlier-born children are more likely to be sent to work than their younger siblings. A few exceptions, however, also exist in the literature.

There are other important factors along with the factors discussed in this paper that have a significant impact on child labour. These are household attributes, such as the education and employment status of parents, household demographics, and household assets etc., and community characteristics. Non-economic factors, such as social and cultural norms and religious beliefs, may also have important impacts on child labour. These types of variables, however, are often difficult to measure and most of the traditional surveys do not capture these variables.

The policy implications for reducing child labour in developing countries are: government and non-government organisations must work together to improve the quality of education, with possible minimum costs, by providing better logistic supports to school going children; the government should introduce/continue targeted subsidy for poor school-going children; school curriculum must be re-designed so that it increases the probability of future employment; law of compulsory education should be staggered to a certain level; and the government and the community must work hard to reduce the overall poverty.

References

Ahmed, A and M A Quasem (1991). *Child Labour in Bangladesh*. Dhaka: Bangladesh Institute of Development Studies.

Akabayashi, H and G Psacharopoulas (1999). The Trade-off between Child Labour and Human Capital Formation: A Tanzanian Case Study. *Journal of Development Studies*, XXXV (5): 120-40.

Amin, S, M S Quayes and J M Rives (2004a). Poverty and Other Determinants of Child Labor in Bangladesh. *Southern Economic Journal*, LXX (4): 876-92.

Andvig, J C (2001). Family-Controlled Child Labour in Sub-Saharan Africa - A Survey of Research. *Social Protection Discussion Paper No. 0122*. Social Protection Unit, Human Development Network, The World Bank.

Baland, J M and J A Robinson (2000). Is Child Labor Inefficient. *Journal of Political Economy*, CVIII (4): 663-79.

Basu, K (1999). Child Labor: Cause, Consequence, and Cure, with Remarks on International Labor Standards. *Journal of Economic Literature*, XXXVII (3): 1083-119.

———— and Z Tzannatos (2003). The Global Child Labor Problem: What Do We Know and What Can We Do?. *The World Bank Economic Review*, XVII (2): 147-73.

——— and P H Van (1998). The Economics of Child Labor. *American Economic Review*, LXXXVIII (3): 412-27.

Behrman, J R (1988). Nutrition, Health, Birth Order and Seasonality: Intrahousehold Allocation among Children in Rural India. *Journal of Development Economics*, XXVIII (1): 43-62.

——— and P Taubman (1986). Birth Order, Schooling, and Earnings. *Journal of Labour Economics*, IV (3): S121-45.

Bhalotra, S and Z Tzanatos (2003). Child Labor: What Have We Learnt?. *Social Protection Discussion Paper No. 0317*. Washington, D.C.: World Bank.

Blunch, N and D Verner (2000). Revisiting the Link between Poverty and Child Labour: The Ghanaian Experience. *Mimeograph*. Washington, D.C.: The World Bank.

Brown, D and P Peter (1992). The Decline of Child Labor in the U.S. Fruit and Vegetable Canning Industry: Law or Economics?. *Business History Review*, LXVI (Winter): 723-70.

Canagarajah, S and H Coulombe (1997). Child Labour and Schooling in Ghana. *Policy Research Working Paper No. 1844*. Washington, D.C.: World Bank.

——— (1997). Child Labour and Schooling in Ghana. *Policy Research Working Paper No. 1844*. Washington, D.C.: World Bank.

Canagarajah, S and H S Nielsen (1999) *Child Labor and Schooling in Africa: A Comparative Study*. Human Development Network, Social Protection, Washington, D.C.: World Bank.

Cartwright, K (1996). Child Labor in Colombia. *Working Paper, 1-28*. Washington, D.C.: World Bank.

——— (1999). Child Labor in Columbia. In Grootaert, C and H Patrinos (eds), *The Policy Analysis of Child Labor: A Comparative Study*. New York: St. Martin's Press.

——— and A Patrinos (1999). Child Labour In Urban Bolivia. In Grootaert, C and H Patrinos (eds), *The Policy Analysis of Child Labor: A Comparative Study*. New York: St. Martin's Press.

Cigno, A and F C Rosati (2002). Child Labour, Education and Nutrition in Rural India?. *Pacific Economic Review*, VII (1): 65-83.

——— and Z Tzannatos (2002). Child Labor Handbook. *Social Protection Discussion Paper 0206*. Washington, D.C.: Human Development Network, Social Protection Advisory Services, World Bank.

Coulombe, H (1998). Child Labour and Education in Coted' Ivoire. *Background Paper*, Washington, D.C.: World Bank.

Datt, G, D Jolliffe and M Sharma (1997). A Profile of Poverty in Egypt. *FCND Discussion Paper No. 49*. Washington, D.C.: Food Consumption and Nutrition Division of the International Food Policy Research Institute.

Davin, A (1982). Child Labour, the Working Class Family, and Domestic Ideology in 19th Century Britain. *Development and Change*, XIII (4): 633-52.

Dessy, S and J Knowles (2001). Why Is Child Labor Illegal?. *PIER Working Paper No. 01-043*. Pennsylvania: Penn Institute for Economic Research, Department of Economics, University of Pennsylvania.

Edmonds, E (2001). Will Child Labor Decline with Improvements in Living Standards?. *Dartmouth College Mimeo*. Dartmouth College.

——— (2003b). Household Composition and the Response of Child Labor Supply to Product Market Integration: Evidence from Vietnam. *Dartmouth College Mimeo and NBER Working Paper*.

——— (2004). Understanding Sibling Differences in Child Labor. *Journal of Population Economics*. (Forthcoming)

——— and C Turk (2002). Child Labor in Transition in Vietnam. *Policy Research Working Paper No. 2774*, Washington, D.C.: World Bank.

Ejrnæs, M and C C Pörtner (2002). Birth Order and the Intrahousehold Allocation of Time and Education. *Working Paper*. Institute of Economics, University of Copenhagen.

Emerson, P M and A P Souza (2003). Is There a Child Labor Trap? Intergenerational Persistence of Child Labor in Brazil. *Economic Development and Cultural Changes*, LI (2): 375-98.

——— (2002). Birth Order, Child Labor and School Attendance in Brazil. *Working Paper*, Denver: University of Colorado.

Fallon, P and Z Tzannatos (1997). *Child Labor: Issues and Direction for the World Bank*. Washington D.C.: World Bank.

Grimsrud, B (2001). Measuring and Analysing Child Labor: Methodological Issues. *World Bank Working Paper*. Washington, D.C.: World Bank.

Hazan, M and B Berdugo (2002). Child Labor, Fertility and Economic Growth. *Economic Journal*, CXII (482): 810-28.

Horton, S (1988). Birth Order and Child Nutritional Status: Evidence from the Philippines. *Economic Development and Cultural Change*, XXXVI (2): 341-54.

Ilahi, N (2000). The Intra-household Allocation of Time and Tasks: What Have We Learnt from the Empirical Literature?. Policy Report on Gender and Development, *Working Paper Series No. 13*. Washington, D.C.: World Bank.

ILO (2006a). *The End of Child Labour: Within Reach, Global Report, 95th Session 2006*. Geneva: International Labour Organisation.

——— (2006b). *Global child labour trends 2000 to 2004*. Geneva: International Labour Organisation.

Khanam, R (2008). Child labour and school attendance: Evidence from Bangladesh. *International Journal of Social Economics*, XXXV (1): 77-98.

——— and M M Rahman (2007). Child Work and Schooling in Bangladesh: The Role of Birth-Order. *Journal of Biosocial Science*, XXXIX (5): 641-56.

Kessler, D (1991). Birth order, Family Size, and Achievement: Family Structure and Wage Determination. *Journal of Labour Economics*, IX (4): 413-26.

Krueger, A B (1996). Observations on International Labor Standards and Trade. *NBER Working Paper 5632*. Labour and Schooling in Peru, Washington, D.C.: World Bank. (Draft)

Lavalette, M (1994). Child Employment in the Capitalist Labour Market. Avebury, England: Ashgate Publishing Limited.

Levison, D, K S Moe and F M Knaul (2001). Youth Education and Work in Mexico. *World Development*, XXIX (1): 167-88.

Lindert, P H (1977). Sibling Position and Achievement. *Journal of Human Resources*, XII (2): 198-219.

Moehling, C M (1999). State Child Labour Laws and the Decline of Child Labour. *Explorations in Economic History*, XXXVI (1): 72-106.

Nielson, H S (1998). Child Labour and School Attendance: Two Joint Decisions. *CLS Working Paper 98-15*, Aarhus, Denmark: Centre for Labour Market and Social Research.

Patrinos, H A and G Psacharapoulas (1995). Educational Performance and Child Labor in Paraguay. *International Journal of Educational Development*, XV (1): 47-60.

——— (1997). Family Size, Schooling and Child Labor in Peru - An Empirical Analysis. *Journal of Population Economics*, X (4): 387-405.

Psacharopoulos, G (1997). Child labor versus educational attainment Some evidence from Latin America. *Journal of Population economics*, X (4): 377-86.

Rahman, Mohammad Mafizur, Rasheda Khanam and Nur Uddin Absar (1999). Child Labor in Bangladesh: A Critical Appraisal of Harkin's Bill and the Mou-Type Schooling Program. *Journal of Economic Issues*, XXXIII (4): 985-1003.

Ranjan, P (1999). An Economic Analysis of Child Labour. *Economic Letters*, LXIV (1): 99-105.

——— (2001). Credit Constraints and the Phenomenon of Child Labour. *Journal of Development Economics*, LXIV (1): 81-102.

Ravallion, M and Q Wodon (2000). Does Child Labor Displace Schooling? Evidence on Behavioral Responses to an Enrolment Subsidy. *Economic Journal*, CX (462): C158-75.

Ray, R (2000a). Analysis of Child labour in Peru and Pakistan: A Comparative Study. *Journal of Population Economics*, XIII (1): 3-19.

——— (2000b). Child Labor, Child Schooling and their Interaction with Adult Labor. *The World Bank Economic Review*, XIV (2): 347-67.

——— (2003). The Determinants of Child Labour and Child Schooling in Ghana. *Journal of African Economics*, XI (4): 561-90.

Rogers, C A and K A Swinnerton (2003). Does Child Labor Decrease When Parental Incomes Rise?. *Georgetown University, Mimeo*.

Rogers, G and G Standing (1981). *Child Work, Poverty and Underdevelopment*. Geneva: ILO.

Sakellariou, C and A Lall (2000). Child Labour in the Philippines: Determinants and Effects. *Asian Economic Journal*, XIV (3): 233-53.

Sasaki, M and T Temesgen (1999). *Children in different activities: Child Labor and Schooling in Peru*. Washington D.C.: World Bank. (Draft)

Schlemmer, B (2000). *The Exploited Child*. UK: Zed Books Ltd. (Translated by Philip Dresner)

Sedlacek, G, S Duryea, N Ilahi and M Sasaki (2003). Child Labor, Schooling, and Poverty in Latin America. In Peter F Orazem and Guilherme Sedlacek (eds), *Eradicating Child Labor in Latin America in the 90s: The Promise of Demand Side Interventions*. Washington, D.C.: World Bank and IDB.

Swinnerton, K A and C A Rogers (1999). The Economics of Child Labor: Comment. *American Economic Review*, LXXXIX (5): 1382-85.

Tanaka, R (2003). Inequality as a Determinant of Child Labor. *Economics Letters*, LXXX (1): 93-97.

Tzannatos, Z (2003). Child Labour and School Enrolment in Thailand in the 1990s. *Economics of Education Review*, XXII (5): 523-36.

Udry, C R (2003). Child labour. *Discussion Paper No. 856*. Yale University Economic Growth Center.

Wahba, J (2000). Do Market Wages Influence Child Labor and Child Schooling?. *Working Paper*. UK: Department of Economics, University of Southampton.

Agriculture Reforms and Market Integration: A Spatial Analysis of Food and Non-Food Commodities

Seema Bathla*

Abstract

Against the background of a series of macroeconomic, agriculture marketing and price policy reforms initiated from the early nineties, this paper seeks to empirically measure the extent to which reforms have led to a higher and quicker integration of agriculture markets across the states. It then explores the policy options that would improve the commodity price transmission and build a market-oriented agri-marketing system in view of APMC Draft Model Rules, being proposed for revamping regulated markets, and enable the emergence of new platforms for agri-marketing. Results based on multivariate co-integration and vector error correction model from 1980-81 to 2002-03 confirm greater spatial market integration in the post-liberalisation period for rice, wheat, sugar and groundnut though only in the selected states. For cotton and soya bean seed, long-run equilibrium relationship among the state-level wholesale markets is found to be weak. Further, in all commodity cases, short-run dynamics based on vector error correction model reveal a slow speed of adjustment of prices towards equilibrium, which calls for accelerating the pace of agri-marketing reforms.

Introduction

Keeping in view the macro-economic, agriculture marketing and price policy reforms the country has been witnessing since the early nineties, this paper explores the policy options to improve the commodity price transmission and build a market-oriented agri-marketing system. The paper starts off by describing the legislative interventions and reforms that have been initiated in the agriculture marketing sector over a period of time. This sets the stage for an empirical evaluation of the magnitude of commodity price convergence that has taken place across the state-level wholesale markets during the post-reform period compared to the pre-reform period. The analysis is based on a multivariate co-integration and error correction model using monthly wholesale prices of six important tradable commodities from 1980-81 to 2002-03. The commodities considered for the analysis are wheat, rice,

---

* Associate Professor, Centre for the Study of Regional Development, Jawaharlal Nehru University. Email: seemab@mail.jnu.ac.in

cotton, sugar, groundnut and soybean seeds. Section III explains the empirical model and results of the econometric exercise carried out for each commodity in the pre- and post-reform period separately. Section IV presents the concluding remarks.

Agricultural Marketing: Interventions and Reforms

There exist a network of 28,090 wholesale and primary rural markets, and 7,557 regulated markets scattered across the country, trading more than 620 billion tonnes of farm output. These regulated markets, governed under the APMC Act 1966, are set up with the prime objective of facilitating farmers, traders and government agencies to procure, store and trade their farm produce conveniently and at fair price. The Act empowers the Central and state governments to pass necessary orders for regulating and prohibiting the production, supply and distribution of agri-commodities, depending upon their essentiality and short supply. The orders/notifications being issued under the APMC and various other Acts[1] are subject to regular modifications depending on the demand and supply of essential commodities in the country. The APMC allows trading through open auction as well as through wholesalers/commission agents and hence prohibits direct marketing of farm produce, setting up of private mandis and private investment in infrastructure. Nearly 80 per ecnt of the trade in regulated markets is handled by the private traders and the rest (10-20 per cent) by the government agencies, along with co-operatives and processors. The produce is channeled through primary wholesalers and secondary wholesalers who act as commission agents (arthiyas), then to retailers, and finally to the consumers. The sellers and buyers pay charges in the form of market fee, loading/unloading charges, development fund/cess and octroi/state entry tax for the services provided by the respective state and the market committee.

Going by the increase in the number of markets and the volume traded, the wholesale markets are expanding fast but their performance is far from satisfactory due to: (i) the presence of numerous intermediaries in the private commodity trade, which has resulted in a lower share of farmer price in the consumer rupee[2], (ii) multiple tax structure, high and non-uniform rate of market fee varying from Rs 0.50 to Rs 25 across commodities and states, (iii) obtaining multiple licenses within a state, (iv) lack of transparency in pricing and transactions, (v) inadequate handling, grading, cold storage chains and other infrastructural shortcomings, due to which

---

[1] See, among others, Prasad (2001) and Bathla (2004) for regulations under various Acts.

[2] The producer's share in consumer rupee, though varies from commodity to commodity and market to market, is estimated to be nearly 70 per cent for food grains and 30 per cent for fruits and vegetables. The percentage share of various intermediaries varies from 6 to 25%. A low share of growers in fruits and vegetables trade is due to their perishable nature and lack of storage facilities. (Acharya 2001; Gandhi and Namboodiri 2002; GoI 2006).

35-40 per cent of the produce is lost annually, and (vi) the absence of vertical coordination, i.e., consolidation of production and processing stages. Stringent regulations and laws, congestion in marketing yards, malpractices by traders like deduction for spot payments, late payments and non-issue of sale slips further lead to wastage, low quality of produce and hence negatively impinge upon the interests of farmers and consumers.

Recognising the growing inefficiencies in the marketing system, which may dissuade gains from trade liberalisation, the government initiated a number of reforms in agriculture markets. To begin with, it reduced tariffs below the required level for a good number of commodities and removed all quantitative barriers to agricultural imports by 2001, which led to a greater openness of markets during the nineties and early 2000 compared to the eighties, and increased the external trade (Bathla 2006). A national policy on handling and storage of food grains, involving the private sector in building storage capacities for holding government stock and for bulk handling and transportation, was announced along with a bill on warehousing. The government has initiated the entry of private sector in the storage of food grains and has relaxed restrictions on stock limits and inter-state movement of food grains and other essential commodities. Proposals related to gradual phasing out of purchase levies for rice and sugar, procurement policy for several commodities such as cotton by the Cotton Corporation of India (CCI), streamlining of food safety laws and their consonance with international standards have been placed on the table. Food processing units are no longer required to obtain licenses for establishing firms and foreign direct investments in food processing and marketing are automatically approved up to 51 per cent equity. Further, realising that APMC 1966 has outlived its utility, the Central government in recent years has initiated draft model legislation, titled the State Agricultural Produce Marketing (Development and Regulation) Act, 2003, with a broader objective of raising competitive marketing and infrastructure development to the level of international standards. Presently, the Central government is in the process of initiating APMC Model Rules, 2007, which are likely to make provision for contract farming, direct sale/purchase centres, establishment of private markets/yards, electronic spot exchanges and public-private partnership in the management and development of markets. Accordingly, legislative amendments are under way in almost all the states. But the progress is slow as only one state, viz. Bihar, has completely repealed the Act. In states like Maharashtra and Rajasthan, amendments are done but corresponding rules are yet to be notified (Annexure 1).

Of late, the government has encouraged the creation of new platforms for agri-marketing through the establishment of terminal markets, rural business hubs, food parks and organised retail agri-business to bring market efficiency and ensure better prices to the farmers. Agricultural futures exchanges have also come up to

further increase the efficiency of markets with an added advantage of advance price discovery and effective forward linkages like warehousing. In the following section, we will analyse the extent to which these policy changes have influenced a greater and higher spatial market integration and further reforms required to strengthen the agri-marketing system. It is hypothesised that market integration for farm commodities across the Indian states has improved in the post-reform period compared to the pre-reform period.

Reforms and the Magnitude of Spatial Market Integration

An understanding of the nature of price linkages, transmission of price signals from one commodity/market to another and their degree of association is central to stabilising the prices of agricultural commodities. The whole process of commodity price movements ensure that the 'law of one price' (LOP) holds whereby a group of prices move proportionally to each other over time, that is, markets for that group are integrated (Kumar 2006; Asche *et al* 1999; Ardeni 1989; Baffes 1991). The concept of 'market integration' rests on the assumption that in the case of identical commodities, shocks arising in one market price are transmitted to other market price. In other words, in a perfectly competitive market, market integration exists when prices of homogeneous commodities in spatially separated markets move mutually in response to the forces of demand and supply. And the speed at which prices in the markets adjust to departures from their equilibrium relationship is taken as an indicator of market efficiency (Heytens 1986; Blyn 1973; Wilson 2001).

The most common test to measure market integration is the co-integration test developed by Johansen (1988) and Johansen and Juselius (1990). The test is carried out in a Vector Auto Regressive mode and is a reduced form method. It has advantage over other approaches such as correlation coefficient, ADF and regression technique as it can be carried out within a multivariate framework and also takes care of endogeniety and simultaneity problems that are associated with other co-integration tests. Co-integration among price series is tested using Johansen's Maximum Likelihood Test based on error correction representation:

$$\Delta y_t = \prod y_{t-1} + \overset{p-1}{\Sigma} T_1 \Delta y_{t-1} + C x_t + \varepsilon t_1$$

Where y_t is a vector of I(1) processes. The rank of Π equals the number of co-integrating vectors, tested by likelihood ratio test statistics for the number of co-integrating vectors 'r' namely, the trace and the maximum Eigenvalue (l-max) statistics of the stochastic matrix. The basic notion behind this approach is that there is a long-run stable equilibrium relationship between two or more time series variables being captured through co-movement between prices and tested by the

Granger representation theorem. The theorem states that if a set of variables is co-integrated, then there exists a valid error correction representation of the data (Engle and Granger 1987). For establishing a long-run relationship between variables/prices in a multivariate framework, the number of co-integrating vectors should be r=N-1, where N represents the total number of variables in co-integrating. For example, in a system of five non-stationary variables, Johansen test estimates five different stochastic trends. The rank of II should be (n-1) co-integrating vectors, i.e., there should be at least four co-integrating vectors for the markets to be truly integrated. This is because the system must contain at least one stochastic trend for the variables/price series to be non-stationary by themselves (Rivera and Helfand, 2001).

To begin with, the variables are checked for stationarity, i.e., whether the time series have a constant mean and variance, and the order of integration of variables and then co-integration test, viz. ADF and/or Johansen, are applied on variables that are integrated of same order. The co-integrating vectors or relations that are obtained in the analysis are normalised. Normalisation is done in such a way that the first 'r' series in the vector is normalised to an identity matrix. Once the variables are found to be co-integrated, a vector error correction model (ECM) is estimated in which case the error-term of variables gives an idea of the magnitude and time path of the reactions of variables to deviations from long-run relationships. In other words, it indicates the speed of adjustment of variables towards equilibrium.

In this paper, Johansen test is applied on cyclical index of the nominal price series of six commodities from 1980-81 to 2002-03, broadly covering pre and post-liberalisation periods. The choice of break year in the co-integration analysis is based on structural break identified in the monthly price series, estimated using Chow Test as well as Cusum of Squares Test developed by Brown, Durbin and Evans (1975). If structural break is not present in the time series, the year 1991 is taken as break up period for decomposition of data into pre and post- liberalisation periods. Only those wholesale markets are chosen for which time series data on monthly prices is available during these years (Annexure 2). The monthly price data obtained for each market is adjusted as per the crop year. Price differences on account of quality and variety of a commodity such as cotton are ignored in the analyses. The major sources of price data are CACP reports and Agriculture Price Situation in India, published by the Ministry of Agriculture, GoI.

Major Findings

As mentioned above, the empirical test of co-integration has to be preceded by a test of non-stationarity for the individual price series under consideration using the DF and the ADF tests. The estimates are obtained on natural logs of the price series as their first differences reflect the rate of change of the variable. While

testing stationarity, regression is run with trend factor as well as without time trend. The order of lag is determined using minimum value of the Akaike's Final Prediction Error criterion. The ADF test for unit root for all the selected six commodities in the pre and post–liberalisation period reveals most of the state- level domestic wholesale prices to be integrated of order 1, ie., I(1). Only exceptions are a few domestic groundnut seed and sugar price time series where the ADF test does not reject the null hypothesis that the price time series follow a unit root process[3]. Johansen test is applied assuming no deterministic trend in the data. The order of VAR (lag interval) is determined by the minimum AIC and SBC. The maximum number of co-integrating vectors and the error correction estimates obtained for the two time periods are compared to see the impact of reforms on price transmission in the domestic markets. Following are the commodity-wise results.

Wheat: Structural break test applied on monthly prices of wheat accepts the null hypothesis of structural stability from 1980-81 to 2002-03. Therefore, co-integration analysis for wheat is carried out from 1980.4-1991.3 and from 1991.4-2003.3, the period before and after initiation of reforms. The ADF unit root test confirms wheat prices during the eighties to be integrated of order one, i.e., I(1) in levels but integrated of order zero (i.e., stationary) in first differences except in Gujarat and Delhi. In the second period, same results hold except for Gujarat, Madhya Pradesh and Delhi. In these three states, the null hypothesis of non-stationarity in levels is rejected. Johansen test is applied on price series that are integrated of same order, ie., I(1) to determine the rank of II or number of co-integrating vectors present. Table 1 presents the results of Johansen multivariate co-integration test for five wheat price series in the domestic markets. From the LR statistics, one can reject the null hypothesis r = 0, r ≤ 1, r ≤ 2 and r ≤ 3 (no co-integration) against the alternative hypothesis r=4 at 5 per cent level of significance. Results confirm presence of 4 co-integrating vectors among wheat prices in Punjab, Haryana, Karnataka, Rajasthan and Uttar Pradesh, and hence suggest a long-run co-integrating or equilibrium relationship among the state-level prices both in the pre and post-liberalisation periods. Prices in three state-level markets, viz., Madhya Pradesh, Delhi and Bihar, are not integrated with other state-level markets. Table '1a' and '1b' presents short-run dynamics based on error correction model in the two time periods. While estimating the error correction model (ECM) in first difference, wheat price in Gujarat, which was found to follow a unit root process in the nineties, is also included. The results present estimates of co-efficients of error-correction model with their t-values and explanatory variables (state-level prices) in first differences. The co-efficients of state-level prices indicate change in prices in a particular state on its own as well as change in prices in other states in the system. It is clear that most of the co-efficients of explanatory variables in the short-run model are statistically significant in the first lag. In the pre-reform

---

[3] Tables not given due to want of space.

period, co-efficients of error term in the domestic markets are negative and statistically significant for all the states. A value of -0.38, -0.26 and -0.16 for Haryana, Rajasthan and Gujarat indicates that the system corrects its previous period's dis-equilibrium by 38 per cent, 26 per cent and 16 per cent in a month-time period. Since the estimates are not in close proximity to 1, they indicate a slow speed of adjustment of these state-level prices to a shock in their own price in a year. The speed of adjustment in the post-reform period shows slight improvement with value of error term at -0.44 in Punjab. An overall analysis shows an improvement in price transmission across markets in the post-reform period, which is consistent with expectations.

Table 1: Wheat: Johansen's Maximum Eigenvalue and Trace Test for Number of Co-integrating Vectors in the Pre and Post-reform Periods

Series in Log	Null Hypo-thesis	Alternate Hypo-thesis	Eigen Value	Likeli-hood Ratio	5 % Critical Value	1 % Critical Value	Hypo-thesised No. of CE(s)	Lag Interval
				Sample: 1980:04 to 1991:03				
Punjab	r = 0	r =1	0.173	70.32	59.46	66.52	None **	2
Haryana	r ≤ 1	r =2	0.131	45.77	39.89	45.58	At most 1 **	
Karnataka	r ≤ 2	r =3	0.107	27.54	24.31	29.75	At most 2 *	
Rajasthan	r ≤ 3	r =4	0.09	12.88	12.53	16.31	At most 3 *	
UP	r ≤ 4	r =5	0.003	0.45	3.84	6.51	At most 4	
				Sample: 1991.04 to 2003:03				
Punjab	r = 0	r =1	0.33	45.34	76.07	84.45	None **	1
Haryana	r ≤ 1	r =2	0.274	86.84	53.12	60.16	At most 1 **	
Karnataka	r ≤ 2	r =3	0.136	41.18	34.91	41.07	At most 2 **	
Rajasthan	r ≤ 3	r =4	0.083	20.37	19.96	24.60	At most 3 *	
UP	r ≤ 4	r =5	0.055	8.06	9.24	12.97	At most 4	

Notes: *(**) denotes rejection of the hypothesis at 5% (1%) significance level.

Table 1a: Wheat - Reduced Form VECM: 1980:04 to 1991:03

Series in Log	D(Punjab)	D(Haryana)	D(Karnataka)	D(Rajasthan)	D(UP)	D(Gujarat)
ECM	-0.26	-0.38	-0.13	-0.26	-0.22	-0.16
	(-3.42)	(-2.43)	(-2.12)	(-2.67)	(-2.36)	(-2.55)
D(Punjab(-1))	-0.162	-0.03	-0.140	-0.183	-0.085	0.035
	(-1.58)	(-0.43)	(-1.87)	(-1.72)	(-0.94)	(0.36)
D(Punjab(-2))	0.142	0.088	-0.044	0.115	0.056	0.240
	(1.43)	(1.04)	(-0.61)	(1.12)	(0.64)	(2.56)
D(Haryana(-1))	0.183	-0.175	0.088	-0.156	0.030	-0.078
	(1.035)	(-1.16)	(0.68)	(-0.84)	(0.19)	(-0.46)
D(Haryana(-2))	0.047	-0.157	-0.031	-0.159	-0.108	-0.057
	(0.30)	(-1.20)	(-0.28)	(-0.99)	(-0.79)	(-0.39)
D(Karnataka(-1))	-0.159	-0.190	-0.139	-0.298	-0.040	-0.063
	(-1.15)	(-1.614)	(-1.38)	(-2.06)	(-0.32)	(-0.48)
D(Karnataka(-2))	-0.009	0.0002	0.052	-0.132	0.180	0.118
	(-0.06)	(0.002)	(0.54)	(-0.96)	(1.53)	(0.94)
D(Rajasthan(-1))	-0.049	-0.007	0.047	-0.128	-0.047	0.169
	(-0.46)	(-0.07)	(0.60)	(-1.14)	(-0.49)	(1.66)
D(Rajasthan(-2))	-0.157	-0.123	-0.056	0.082	-0.159	0.073
	(-1.65)	(-1.518)	(-0.80)	(0.82)	(-1.87)	(0.81)
D(UP(-1))	-0.001	0.134	-0.066	0.166	-0.003	-0.093
	(-0.01)	(1.136)	(-0.65)	(1.14)	(-0.03)	(-0.70)
D(UP(-2))	-0.111	0.008	-0.023	0.015	0.187	-0.171
	(-0.85)	(0.07)	(-0.25)	(0.11)	(1.62)	(-1.39)
D(Gujarat(-1))	0.272	0.279	0.171	0.297	0.116	0.038
	(2.55)	(3.07)	(2.20)	(2.67)	(1.22)	(0.38)
D(Gujarat(-2))	0.154	0.172	0.086	0.310	-0.002	0.013
	(1.42)	(1.873)	(1.10)	(2.76)	(-0.029)	(0.127)
R-squared	0.277	0.260	0.221	0.275	0.195	0.171
Adj. R-squared	0.181	0.161	0.118	0.178	0.088	0.06
Sum sq. resids	0.502	0.365	0.267	0.54	0.399	0.452
S.E. equation	0.066	0.056	0.048	0.06	0.059	0.06
F-statistic	2.88	2.649	2.149	2.858	1.832	1.56
Log likelihood	174.76	195.35	215.37	169.49	189.58	181.5
Akaike AIC	-2.46	-2.78	-3.09	-2.37	-2.69	-2.56
Schwarz SC	-2.10	-2.426	-2.73	-2.025	-2.33	-2.212

Notes: Figures in parentheses denote t values. D denotes first difference.

Table 1b: Wheat - Reduced Form VECM: 1991:04 to 2003:03

Series in Log	D(Punjab)	D(Haryana)	D(Karnataka)	D(Rajasthan)	D(UP)	D(Gujarat)
ECM	-0.44	-0.37	-0.27	-0.41	-0.38	-0.39
	(-4.40)	(-2.89)	(-4.31)	(-3.74)	(-3.63)	(-3.88)
D(Punjab(-1))	0.054	-0.184	-0.071	0.059	0.042	0.094
	(0.53)	(-1.86)	(-0.67)	(0.62)	(0.407)	(0.74)
D(Punjab(-2))	0.059	-0.042	-0.165	-0.040	0.070	-0.095
	(0.69)	(-0.51)	(-1.86)	(-0.51)	(0.81)	(-0.90)
D(Haryana(-1))	-0.228	-0.077	-0.211	-0.003	-0.058	-0.506
	(-1.69)	(-0.59)	(-1.50)	(-0.03)	(-0.42)	(-3.03)
D(Haryana(-2))	-0.247	-0.086	-0.219	-0.208	-0.171	-0.137
	(-2.02)	(-0.72)	(-1.73)	(-1.83)	(-1.38)	(-0.91)
D(Karnataka(-1))	-0.056	0.0004	-0.054	-0.017	0.016	0.153
	(-0.69)	(0.005)	(-0.64)	(-0.23)	(0.20)	(1.51)
D(Karnataka(-2))	0.027	-0.041	-0.0008	-0.113	-0.014	0.128
	(0.34)	(-0.54)	(-0.01)	(-1.53)	(-0.18)	(1.30)
D(Rajasthan(-1))	0.050	0.15	0.199	0.018	0.100	-0.174
	(0.42)	(1.28)	(1.59)	(0.167)	(0.82)	(-1.16)
D(Rajasthan(-2))	0.051	0.112	0.155	0.067	0.003	-0.067
	(0.52)	(1.18)	(1.53)	(0.74)	(0.03)	(-0.55)
D(UP(-1))	0.249	0.32	0.078	-0.085	-0.035	0.162
	(1.99)	(2.64)	(0.60)	(-0.73)	(-0.27)	(1.05)
D(UP(-2))	0.191	0.161	0.281	0.144	0.092	0.117
	(1.76)	(1.53)	(2.49)	(1.42)	(0.83)	(0.86)
D(Gujarat(-1))	0.17	0.153	-0.204	0.023	0.067	-0.219
	(1.97)	(1.83)	(-2.27)	(0.28)	(0.77)	(-2.04)
D(Gujarat(-2))	0.065	0.098	-0.036	-0.014	0.069	-0.044
	(0.86)	(1.33)	(-0.46)	(-0.20)	(0.89)	(-0.46)
R-squared	0.32	0.274	0.29	0.24	0.22	0.33
Adj. R-squared	0.24	0.187	0.206	0.154	0.131	0.25
Sum sq. resids	0.432	0.404	0.464	0.37	0.446	0.66
S.E. equation	0.058	0.056	0.060	0.054	0.05	0.072
F-statistic	4.00	3.157	3.43	2.70	2.41	4.27
Log likelihood	207.87	212.6	202.87	218.29	205.7	177.68
Akaike AIC	-2.72	-2.78	-2.65	-2.86	-2.69	-2.29
Schwarz SC	-2.38	-2.45	-2.316	-2.53	-2.35	-1.95

Notes: Figures in parentheses denote t values. D denotes first difference.

Rice: Like wheat, price series of rice reveal absence of structural break from 1980-81 to 2002-03. The bifurcation of period is, therefore, done as per the initiation of SAP in 1991. The unit root test for the pre- and post-liberalisation period rejects the null hypothesis of unit root problem (non-stationarity) in all the state-level price series in both time periods. Only in one state, viz. Maharashtra, the hypothesis of unit root is accepted and hence is excluded from the long-run co-integration analysis. Overall analysis indicates that most of the states are integrated of order one at varying lag intervals in both pre- and post-liberalisation periods, which implies the presence of similar long-run characteristics amongst the domestic rice prices. However, of all the states taken in the analysis, integration is found between Andhra Pradesh, Karnataka, Kerala, Orissa, Tamil Nadu and West Bengal during the eighties. In the nineties i.e. in the post-reform period, Kerala and Orissa have not shown any association with these states. Instead, rice prices in Haryana and Uttar Pradesh markets have shown greater integration with other domestic markets in the nineties. The states, which have hardly shown any association with other state-level prices, are Gujarat and Bihar (Table 2). The short-run dynamics captured through vector error correction model during the eighties and nineties are presented in 'Table 2a' and 'b'. Coefficients of the error term are negative and highly significant for all the selected markets in the eighties. The coefficients vary between a minimum value of 0.20 to a maximum of 0.37 and indicate a slow speed of adjustment towards equilibrium. The results of the ECM during the post-reform period are again robust. But negative and statistically significant estimates are not in close proximity to 1, which implies a slow speed of adjustment of domestic prices to the equilibrium path.

Table 2: Rice: Johansen's Maximum Eigenvalue and Trace Test for Number of Co-integrating Vectors in the Pre- and Post-Reform Periods

Series in Log	Null Hypo-thesis	Alternate Hypo-thesis	Eigen Value	Likeli-hood Ratio	5 % Critical Value	1 % Critical Value	Hypo-thesised No. of CE(s)	Lag Interval
				Sample: 1980:10 1991:09				
AP	r = 0	r =1	0.234	112.76	82.49	90.45	None **	1
Karnataka	r ≤ 1	r =2	0.193	78.01	59.46	66.52	At most 1 **	
Kerala	r ≤ 2	r =3	0.155	50.13	39.89	45.58	At most 2 **	
Orissa	r ≤ 3	r =4	0.112	28.22	24.31	29.75	At most 3 *	
Tamil Nadu	r ≤ 4	r =5	0.090	12.71	12.53	16.31	At most 4 *	
West Bengal	r ≤ 5	r =6	0.002	0.31	3.84	6.51	At most 5	

Sample: 1991:10 2002:09								
A P	r = 0	R =1	0.285	139.67	102.14	111.01	None **	1
Karnataka	r ≤ 1	R =2	0.217	96.029	76.07	84.45	At most 1 **	
Tamil Nadu	r ≤ 2	R =3	0.180	64.225	53.12	60.16	At most 2 **	
West Bengal	r ≤ 3	r =4	0.119	38.41	34.91	41.07	At most 3 *	
Haryana	r ≤ 4	r =5	0.114	21.85	19.96	24.60	At most 4 *	
U P	r ≤ 5	r =6	0.045	6.039	9.24	12.97	At most 5	

Notes: *(**) denotes rejection of the hypothesis at 5% (1%) significance level.

Table 2a: Rice - Reduced Form VECM: 1980:10 to 1991:09

Series in Log	D(AP)	D(Karnataka)	D(Kerala)	D(Orissa)	D(TN)	D(WB)	D(Maharashtra)
ECM	-0.35	-0.33	-0.37	-0.18	-0.27	-0.23	-0.20
	(-4.72)	(-3.98)	(-5.40)	(-3.47)	(-3.40)	(-3.26)	(-2.36)
D(AP(-1))	-0.129	-0.021	-0.162	-0.055	0.0008	-0.11	0.01
	(-1.48)	(-0.19)	(-1.45)	(-0.619)	(0.006)	(-1.04)	(0.14)
D(Karnataka(-1))	-0.05	-0.06	0.062	0.07	0.192	0.120	0.0007
	(-0.71)	(-0.65)	(0.64)	(0.964)	(1.67)	(1.31)	(0.009)
D(Kerala(-1))	-0.080	-0.02	0.112	-0.069	-0.074	-0.152	0.036
	(-1.127)	(-0.28)	(1.23)	(-0.94)	(-0.687)	(-1.75)	(0.484)
D(Orissa(-1))	0.062	-0.011	-0.028	0.125	-0.131	0.42	-0.015
	(0.815)	(-0.107)	(-0.26)	(1.415)	(-1.00)	(4.02)	(-0.175)
D(Tamil Nadu(-1))	-0.0009	0.017	0.082	0.052	-0.0100	0.103	0.024
	(-0.015)	(0.21)	(1.00)	(0.78)	(-0.10)	(1.31)	(0.36)
D(West Bengal(-1))	-0.11	0.118	0.084	0.086	0.048	-0.126	0.074
	(-1.58)	(1.32)	(0.91)	(1.15)	(0.44)	(-1.43)	(0.97)
D(Maharashtra(-1))	0.03	0.096	0.090	0.064	0.108	0.157	-0.11
	(0.34)	(0.793)	(0.72)	(0.63)	(0.71)	(1.30)	(-1.06)
R-squared	0.25	0.243	0.26	0.20	0.186	0.30	0.128
Adj. R-squared	0.182	0.17	0.201	0.126	0.11	0.236	0.047
Sum sq. resids	0.24	0.36	0.396	0.25	0.56	0.36	0.268
S.E. equation	0.045	0.055	0.057	0.046	0.069	0.055	0.047
F-statistic	3.61	3.44	3.96	2.69	2.45	4.62	1.583
Log likelihood	223.89	196.75	192.07	219.67	168.66	197.86	217.33
Akaike AIC	-3.25	-2.84	-2.77	-3.19	-2.41	-2.85	-3.15
Schwarz SC	-2.99	-2.57	-2.50	-2.93	-2.145	-2.59	-2.89

Notes: Figures in parentheses denote t values. D denotes first difference.

Table 2b: Rice - Reduced Form VECM: 1991:10 to 2002:09

Series in Log	D(AP)	D(TN)	D(Karnataka)	D(WB)	D(Haryana)	D(UP)	D(Maharashtra)
ECM	-0.46	-0.35	-0.17	-0.14	-0.25	-0.32	-0.30
	(-5.32)	(-4.14)	(-3.42)	(-2.93)	(-3.10)	(-4.258)	(-4.71)
D(AP(-1))	-0.046	0.066	0.042	-0.099	-0.032	0.029	-0.062
	(-0.53)	(1.12)	(0.56)	(-1.49)	(-0.476)	(0.408)	(-1.130)
D(Tamil Nadu(-1))	0.176	-0.173	0.021	-0.089	0.006	-0.100	-0.068
	(1.26)	(-1.86)	(0.18)	(-0.85)	(0.061)	(-0.877)	(-0.789)
D(Karnataka(-1))	0.077	0.013	-0.075	0.131	0.118	0.197	0.006
	(0.74)	(0.195)	(-0.86)	(1.68)	(1.474)	(2.296)	(0.104)
D(West Bengal(-1))	-0.14	0.136	-0.048	-0.027	0.124	-0.020	-0.044
	(-1.16)	(1.68)	(-0.47)	(-0.305)	(1.317)	(-0.207)	(-0.585)
D(Haryana(-1))	-0.20	-0.038	0.23	0.026	-0.083	0.120	-0.027
	(-1.55)	(-0.44)	(2.17)	(0.272)	(-0.830)	(1.122)	(-0.339)
D(UP(-1))	-0.190	-0.0005	-0.095	0.006	-0.046	-0.050	0.001
	(-1.70)	(-0.007)	(-1.01)	(0.082)	(-0.537)	(-0.542)	(0.017)
D(Maharashtra(-1))	0.19	-0.077	-0.058	0.078	0.094	-0.071	0.073
	(1.35)	(-0.79)	(-0.47)	(0.720)	(0.842)	(-0.594)	(0.812)
R-squared	0.31	0.27	0.163	0.156	0.18	0.231	0.265
Adj. R-squared	0.243	0.204	0.086	0.077	0.103	0.159	0.197
Sum sq. resids	0.58	0.259	0.41	0.327	0.347	0.397	0.226
S.E. equation	0.07	0.046	0.059	0.052	0.054	0.058	0.043
F-statistic	4.76	4.02	2.10	1.99	2.35	3.22	3.88
Log likelihood	167.20	219.65	189.46	204.43	200.54	191.8874	228.41
Akaike AIC	-2.38	-3.194	-2.73	-2.96	-2.90	-2.76	-3.32
Schwarz SC	-2.123	-2.93	-2.46	-2.69	-2.63	-2.502	-3.06

Notes: Figures in parentheses denote t values. D denotes first difference.

Sugar: Cusum of squares test carried out on sugar prices reveals no structural break. The results estimated separately for the eighties (1980.10-1991.0) and the nineties (1991.10-2001.9) show unit root problem to be present in most of the states during the eighties. Of all the states, sugar markets in Uttar Pradesh, Punjab and Karnataka corresponds to I(1). Co-integration results carried out for these three states indicate the presence of long-run or equilibrium relationship between sugar prices Results during the nineties suggest sugar prices to be integrated across the domestic markets with the only exception of Maharashtra. The null hypothesis of no cointegration 'r ≤ 4' against the alternative hypothesis of 'r=5' is rejected at 5 per cent level of significance and it confirms the presence of 5 co-integrating vectors among sugar prices of Uttar Pradesh, Punjab, Andhra Pradesh, Karnataka, Bihar and Tamil Nadu markets. As expected, short-run error-correction model reveals

negative and statistically significant values of the error-term during the pre-reform period. Like wheat and rice, the ECM of sugar prices is also on the lower side thereby indicating a slow speed of reconciliation of short-run behaviour with the long-run. It is negative and insignificant only in Punjab and Karnataka. Compared to pre-reform estimates, co-efficient of error-term in the post-reform era shows significant improvement. The ECM in all the state-level markets is negative and significant, and varies between 0.14 in Punjab to 0.43 in Bihar (Table 3a and b).

Table 3: Sugar: Johansen's Maximum Eigenvalue and Trace Test for Number of Co-integrating Vectors in the Pre- and Post-Reform Periods

Series in Log	Null Hypo-thesis	Alternate Hypo-thesis	Eigen Value	Likeli-hood Ratio	5 % Critical Value	1 % Critical Value	Hypo-thesised No. of CE(s)	Lag Interval
				Sample: 1980:10 1991:09				
UP	r = 0	r =1	0.296	70.561	34.91	41.07	None **	1
Punjab	r ≤ 1	r =2	0.115	24.77	19.96	24.60	At most 1 **	
Karnataka	r ≤ 2	r =3	0.065	8.866	9.24	12.97	At most 2	
				Sample: 1991.10 to 2001.9				
UP	r = 0	r =1	0.343	163.78	102.14	111.01	None **	1
Punjab	r ≤ 1	r =2	0.280	114.09	76.07	84.45	At most 1 **	
Karnataka	r ≤ 2	r =3	0.217	75.32	53.12	60.16	At most 2 **	
Tamil Nadu	r ≤ 3	r =4	0.155	46.38	34.91	41.07	At most 3**	
Bihar	r ≤ 4	r =5	0.138	26.41	19.96	24.60	At most 4**	
A P	r ≤ 5	r =6	0.072	8.81	9.24	12.97	At most 5	

Notes: *(**) denotes rejection of the hypothesis at 5% (1%) significance level.

Table 3a: Sugar - Reduced Form VECM: 1980:10 to 1991:09

Series in Log	D(UP)	D(Punjab)	D(Karnataka)	D(TN)	D(Bihar)	D(Maharashra)	D(AP)
ECM	-0.70*	-0.057	-0.019	-0.036*	-0.097*	-0.074*	-0.40*
	(-4.67)	(-0.83)	(-1.167)	(-2.41)	(-2.51)	(-2.30)	(-2.89)
D(UP(-1))	0.048	0.065	0.0008	-0.021	-0.148	0.082	0.043
	(0.391)	(0.62)	(0.007)	(-0.22)	(-1.66)	(1.06)	(0.377)
D(Punjab(-1))	-0.158	-0.341	0.021	0.004	0.132	-0.055	-0.137
	(-1.22)	(-3.14)	(0.19)	(0.04)	(1.43)	(-0.69)	(-1.15)
D(Karnataka(-1))	-0.133	0.065	-0.158	0.028	-0.032	0.162	0.089
	(-1.26)	(0.73)	(-1.75)	(0.34)	(-0.42)	(2.48)	(0.91)
D(Tamil Nadu(-1))	0.133	0.128	0.142	-0.06	0.026	0.041	0.047
	(1.05)	(1.20)	(1.312)	(-0.70)	(0.29)	(0.53)	(0.40)

contd...

D(Bihar(-1))	-0.12	0.180	0.078	0.158	-0.18	-0.08	0.113
	(-1.02)	(1.74)	(0.75)	(1.66)	(-2.06)	(-1.16)	(1.01)
D(Maharashtra(-1))	-0.028	0.044	-0.093	-0.118	0.115	-0.17	-0.191
	(-0.19)	(0.35)	(-0.73)	(-1.02)	(1.08)	(-1.84)	(-1.38)
D(AP(-1))	-0.01	-0.025	-0.047	0.06	0.053	-0.021	-0.083
	(-0.07)	(-0.23)	(-0.436)	(0.63)	(0.58)	(-0.26)	(-0.704)
R-squared	0.255	0.14	0.09	0.16	0.144	0.158	0.203
Adj. R-squared	0.20	0.08	0.03	0.10	0.088	0.103	0.151
Sum sq. resids	1.80	1.28	1.31	1.09	0.927	0.69	1.534
S.E. equation	0.122	0.10	0.10	0.094	0.087	0.07	0.112
F-statistic	5.18	2.50	1.58	2.88	2.56	2.85	3.86
Log likelihood	93.61	115.6	114.2	126.30	136.78	155.7	104.07
Akaike AIC	-1.30	-1.64	-1.61	-1.804	-1.96	-2.25	-1.46
Schwarz SC	-1.10	-1.44	-1.42	-1.606	-1.76	-2.05	-1.264

Notes: Figures in parentheses denote t values. D denotes first difference.

Table 3b: Sugar - Reduced Form VECM: 1991:10 to 2001: 09

Series in Log	D(AP)	D(Punjab)	D(Karnataka)	D(TN)	D(Bhinar)	D(AP)
ECM	-0.37*	-0.17*	-0.34*	-0.36*	-0.417*	-0.37*
	(-3.96)	(-2.59)	(-3.51)	(-3.94)	(-5.23)	(-3.99)
D(Uttar Pradesh (-1))	0.255	0.178	-0.100	-0.062	0.031	0.074
	(2.22)	(2.85)	(-1.39)	(-0.75)	(0.38)	(0.89)
D(Punjab(-1))	-0.012	-0.043	-0.010	-0.093	0.054	0.116
	(-0.07)	(-0.47)	(-0.10)	(-0.78)	(0.46)	(0.96)
D(Karnataka(-1))	-0.134	-0.006	-0.103	-0.087	0.074	-0.250
	(-0.84)	(-0.059)	(-0.99)	(-0.73)	(0.62)	(-2.35)
D(Tamil Nadu(-1))	0.161	0.173	0.041	-0.094	-0.031	-0.077
	(1.22)	(2.09)	(0.48)	(-0.96)	(-0.32)	(-0.89)
D(Bihar(-1))	0.027	0.047	0.035	0.156	-0.010	0.086
	(0.21)	(0.58)	(0.43)	(1.64)	(-0.11)	(1.02)
D(Andhra Pradesh (-1))	-0.185	-0.008	-0.071	-0.388	0.024	-0.121
	(-1.23)	(-0.085)	(-0.73)	(-3.46)	(0.22)	(-1.21)
R-squared	0.20	0.195	0.26	0.324	0.27	0.306
Adj. R-squared	0.127	0.119	0.198	0.26	0.20	0.241
Sum sq. resids	1.47	0.58	0.63	0.83	0.79	0.65
S.E. equation	0.117	0.07	0.07	0.088	0.08	0.078
F-statistic	2.71	2.59	3.89	5.13	4.03	4.72
Log likelihood	90.91	145.18	140.8	124.9	127.7	139.0
Akaike AIC	-1.35	-2.27	-2.20	-1.93	-1.97	-2.16
Schwarz SC	-1.09	-2.01	-1.94	-1.67	-1.72	-1.91

Notes: Figures in parentheses denote t values. D denotes first difference.

Cotton: Time series data on wholesale prices of cotton lint is available only for two markets, viz., Maharashtra and Tamil Nadu, that too from 1982 to 1998. Structural break test shows break to have occurred first in 1991.1 and then in 1995.1. Therefore, time series data is bifurcated into pre- and post-reform period as 1982.10-1990.09 and 1994.10-1998.9. The ADF test of unit root performed on state-level prices in two time periods rejects the null hypothesis of unit root in levels. Price series are integrated of order one, both in the pre- and post-liberalisation periods with number of lags at 1. From the estimates of Eigen values and maximum likelihood ratio and their critical values, one may notice presence of one co-integrating vector during the eighties but none during the nineties (Table 4). This suggests that prices in these two domestic markets were integrated during the eighties and lacked linkage during the subsequent decade. The co-efficient of Tamil Nadu markets bears a positive sign in the equation. The speed of adjustment captured through error-term is very low. Further, the co-efficients of explanatory variables in the short-run model in the first lag are not statistically significant in any of the two markets (Table 4a).

Table 4: Cotton: Johansen's Maximum Eigenvalue and Trace Test for Number of Co-integrating Vectors in the Pre- and Post-Reform Periods

Series in Log	Null Hypo-thesis	Alternate Hypo-thesis	Eigen Value	Likeli-hood Ratio	5 % Critical Value	1 % Critical Value	Hypo-thesised No. of CE(s)	Lag Interval
Sample: 1982:10 1990:09								
Maharashtra	r = 0	r =1	0.14	21.43	19.96	24.60	None *	2
Tamil Nadu	r ≤ 1	r =2	0.073	7.06	9.24	12.97	At most 1	
Sample: 1994:10 to 1998:09								
Maharashtra	r = 0	r =1	0.160	10.46	19.96	24.60	None	2
Tamil Nadu	r ≤ 1	r =2	0.051	2.41	9.24	12.97	At most 1	

Notes: *(**) denotes rejection of the hypothesis at 5% (1%) significance level.

Table 4a: Cotton - Reduced Form VECM:1982:10 to 1990:09

Series in Log	D(Maharashtra)	D(Tamil Nadu)
ECM	-0.181*	0.029
	(-3.70)	(1.06)
D(Maharashtra(-1))	0.085	0.111
	(0.84)	(1.046)
D(Maharashtra(-2))	0.0125	-0.010
	(0.123)	(-0.09)
D(Tamil Nadu(-1))	-0.190	-0.096
	(-1.80)	(-0.85)

contd...

D(Tamil Nadu(-2))	-0.17	-0.034
	(-1.61)	(-0.30)
R-squared	0.141	0.023
Adj. R-squared	0.102	-0.020
Sum sq. resides	0.392	0.447
S.E. equation	0.066	0.071
F-statistic	3.63	0.540
Log likelihood	122.26	116.19
Akaike AIC	-2.521	-2.39
Schwarz SC	-2.38	-2.25

Notes: Figures in parentheses denote t values. D denotes first difference.

Table 5: Groundnut Seed: Johansen's Maximum Eigenvalue and Trace Test for Number of Co-integrating Vectors in the Pre- and Post-Reform Periods

Series in Log	Null Hypo-thesis	Alternate Hypo-thesis	Eigen Value	Likeli-hood Ratio	5 % Critical Value	1 % Critical Value	Hypo-thesised No. of CE(s)	Lag Interval
			Sample: 1980:11 1992:10					
AP	r = 0	r =1	0.232	63.38	34.91	41.07	None **	1
TN	r ≤ 1	r =2	0.149	25.81	19.96	24.60	At most 1**	
UP	r ≤ 2	r =3	0.019	2.80	9.24	12.97	At most 2	
			Sample: 1992:11 2003:10					
AP	r = 0	r =1	0.119	23.36	19.96	24.60	None *	1
UP	r ≤ 1	r =2	0.050	6.80	9.24	12.97	At most 1	

Notes: *(**) denotes rejection of the hypothesis at 5% (1%) significance level.

Oilseeds: Analysis of groundnut seed prices shows structural break to have occurred during 1992-93 in many states and that is why the time series data is divided into two periods-1980.11-1992.10 and 1992.11-2003, broadly representing pre- and post-liberalisation periods. Johansen test indicates three states viz. Andhra Pradesh, Tamil Nadu and Uttar Pradesh to be integrated during the pre-reform period. As co-integration test is applied to series that are integrated of same order, Tamil Nadu is excluded from the analysis during the nineties due to the different order of integration. The result confirm the presence of a long-run equilibrium relationship between Andhra Pradesh and Uttar Pradesh as the LR statistics rejects null hypothesis of 'r=0' against 'r=1' and indicates one co-integrating relationship (Table 5). For estimating the speed of adjustment of groundnut prices in the wholesale markets to equilibrium, Gujarat is also included in the ECM. Results furnished in Table 5a and b reveal statistically significant negative value of the error

term for Andhra Pradesh and Uttar Pradesh markets during the eighties, with values estimated at 0.21 to 0.23, respectively. Results show improvement in the subsequent decade, as co-efficients are statistically significant with negative signs varying from 0.03 to 0.21 for the select states. The error-term estimates, which are on the lower side in both time periods, have remained more or less at the same level.

Table 5a: Groundnut Seed- Reduced Form VECM : 1980:11 to 1992:10

Series in log	D(AP)	D(UP)	D(Gujarat)	D(Tamil Nadu)
ECM	-0.210*	-0.233*	0.425	0.263
	(-1.75)	(-6.102)	(3.10)	(2.12)
D(Andhra Pradesh (-1))	-0.202	-0.347	-0.20	-0.081
	(-1.70)	(-3.45)	(-1.48)	(-0.66)
D(Uttar Pradesh (-1))	-0.017	-0.029	0.031	0.060
	(-0.205)	(-0.399)	(0.31)	(0.677)
D(Gujarat(-1))	-0.035	-0.050	-0.124	0.099
	(-0.43)	(-0.73)	(-1.34)	(1.179)
D(Tamil Nadu(-1))	0.267	0.345	0.520	0.05
	(2.30)	(3.49)	(3.92)	(0.43)
R-squared	0.105	0.272	0.145	0.051
Adj. R-squared	0.07	0.245	0.114	0.016
Sum sq. resids	0.93	0.672	1.213	0.997
S.E. equation	0.08	0.070	0.09	0.085
F-statistic	3.21	10.18	4.64	1.46
Log likelihood	155.32	178.54	136.61	150.5
Akaike AIC	-2.10	-2.43	-1.83	-2.03
Schwarz SC	-1.97	-2.30	-1.71	-1.91

Notes: Figures in parentheses denote t values. D denotes first difference.

Table 5b: Groundnut Seed- Reduced Form VECM : 1992:11 to 2003:10

Series in log	D(AP)	D(UP)	D(Gujarat)	D(Tamil Nadu)
ECM	-0.186*	-0.038	-0.205*	-0.160
	(-3.03)	(-1.09)	(-3.50)	(-1.57)
D(Andhra Pradesh (-1))	-0.034	-0.147	0.152	-0.074
	(-0.35)	(-1.84)	(1.47)	(-0.60)
D(Uttar Pradesh (-1))	-0.116	-0.191	-0.083	-0.034
	(-1.09)	(-2.17)	(-0.73)	(-0.255)
D(Gujarat(-1))	0.082	-0.037	-0.120	0.015
	(0.98)	(-0.54)	(-1.35)	(0.15)
D(Tamil Nadu(-1))	-0.006	0.281	0.029	-0.244
	(-0.06)	(3.83)	(0.30)	(-2.16)

contd...

R-squared	0.098	0.192	0.16	0.119
Adj. R-squared	0.069	0.166	0.133	0.09
Sum sq. resides	0.505	0.342	0.57	0.80
S.E. equation	0.06	0.05	0.067	0.080
F-statistic	3.42	7.43	5.95	4.24
Log likelihood	176.2	201.5	168.37	145.87
Akaike AIC	-2.63	-3.02	-2.513	-2.167
Schwarz SC	-2.52	-2.91	-2.40	-2.05

Notes: Figures in parentheses denote t values. D denotes first difference.

For soyabean seed, structural break appears to have taken place in 1996.1. Therefore, bifurcation of time series price data from 1982-83 to 1998-99 is done in two periods, 1982.11-1991.10 and 1995.11-1999.10. Wholesale price data is available only for two markets, one in Madhya Pradesh and other in Uttar Pradesh. In both cases, ADF test of unit root does not reject the null hypothesis that the price time series follow unit root process. However, the hypothesis in the first difference enables us to reject unit root hypothesis at 1 per cent level of significance. This implies that price differentials can be used in the ECM. Long-term co-integration between the domestic markets in the pre- and post-reform periods presented in Table 6 and 6a reveals that while we can reject the hypothesis of no co-integration in the domestic markets in the pre-reform period, the same cannot be rejected in the post-reform period. Since long-run integration is not detected in the domestic markets during post-reform period, no error correction model is estimated. The estimate of error term in Madhya Pradesh is negative and insignificant, and that in Uttar Pradesh is negatively significant (0.29) at 1 per cent level of significance during the eighties.

In short, the analysis provides evidence in favour of an improvement in the short-run and long-run relationships between the wholesale market prices of wheat, rice, sugar and groundnut in the post-reform period with a larger set of states in India to be integrated with each other. For cotton and soyabean seed, price integration is non-existent in the post-reform period across the Indian markets. The estimates of long-run co-integrating equations normalised around prices in one state bear the expected signs (Annexure 3). Further, short-run dynamics captured through VECM are negatively significant and vary between 0 and 1. The error-term co-efficients are not in close proximity to 1, which indicate that the previous period's dis-equilibrium in domestic prices is corrected at a slower pace**.** Therefore, the hypothesis that domestic market integration has improved in the post-reform period compared to the pre-reform period and is accepted for cereals, sugar and groundnut seed but only in the major crop producing states.

Table 6: Soyabean Seed: Johansen's Maximum Eigenvalue and Trace Test for Number of Co-integrating Vectors in the Pre- and Post-Reform Periods

Series in Log	Null Hypo-thesis	Alternate Hypo-thesis	Eigen Value	Likeli-hood Ratio	5 % Critical Value	1 % Critical Value	Hypo-thesised No. of CE(s)	Lag Interval
			Sample: 1982:11 1991:10					
M P	r = 0	r =1	0.202	28.48	19.96	24.60	None **	1
U P	r ≤ 1	r =2	0.041	4.44	9.24	12.97	At most 1	
			Sample: 1995:11 1999:10					
M P	r = 0	r =1	0.145	8.53	19.96	24.60	None	1
U P	r ≤ 1	r =2	0.028	1.33	9.24	12.97	At most 1	

Notes: *(**) denotes rejection of the hypothesis at 5% (1%) significance level.

Table 6a: Soyabean Seed - Reduced Form VECM : 1982:11 to 1991:10

Series in Log	D(Madhya Pradesh)	D(Uttar Pradesh)
ECM	-0.111	-0.292*
	(-1.15)	(-4.25)
D(Madhya Pradesh(-1))	-0.211	-0.020
	(-1.87)	(-0.23)
D(Uttar Pradesh(-1))	-0.021	0.063
	(-0.18)	(0.69)
R-squared	0.089	0.187
Adj. R-squared	0.072	0.171
Sum sq. resids	0.771	0.473
S.E. equation	0.08	0.067
F-statistic	5.08	11.89
Log likelihood	110.49	136.3
Akaike AIC	-2.028	-2.51
Schwarz SC	-1.952	-2.44

Notes: Figures in parentheses denote t values. D denotes first difference.

Another finding is that there exist minimum diversions along the long-run path for wheat and rice and to some extent for sugar compared to cotton and oilseeds. As stated in Jha *et al* (1997) and Chand and Jha (2001), this phenomenon could be attributed to MSP and procurement policy of the government, which helps absorb price shocks and bring stability, particularly in the states where procurement operations are effectively undertaken. The analysis in this paper validates this point as a higher degree of integration of wheat and rice prices is found mainly in

Andhra Pradesh, Haryana, Punjab, Tamil Nadu and Karnataka where the government actively undertakes procurement operations as per the MSP. A co-movement of wholesale and minimum support prices of wheat and rice found in these states apparently sets the trend in the commodity markets for prices to wander and stabilize, and thus creating complexity to comprehend price transmission in an empirical model. In comparison, in states like Bihar, Orissa and Kerala, where procurement policy for cereals is not effective, wheat-rice prices follow the forces of demand and supply and often fall when the produce reaches the market. Empirical results in this paper reveal absence of price convergence in these states. In the case of oilseeds, a greater magnitude of diversion in prices might have occurred due to an exceptional increase in its prices during 1998-99. Also, unlike cereals, MSP for oilseeds though announced every year is not effective in inducing price stability and oilseed prices depend entirely on market situation (Kumar 2006). Apart from regional bias in the price policy, there are other factors behind the absence of full/complete price transmission and slow speed of adjustment of prices to long-run equilibrium path. These include (i) varying response of different regions to policy changes, (ii) partial amendments in the APMC and marketing reforms across the states, (iii) delay in price information across markets, (iv) low marketable surplus, and (v) weak infrastructure and transport bottlenecks.

These findings indicate a pressing need for encouraging the development of alternative marketing models to create competition and enable proper price discovery, which would eventually strengthen the bargaining power of the farmers. In the process, adequate infrastructure such as cold chains, refrigerated vans and warehouses would be created and hence enable greater integration with the global markets. In the recent past, there has been an increasing private participation and investment in the organised retail agri-business, contract farming, IT-based farm operations and agri-commodity exchanges for futures trading. As of today, most of the companies have set up their distribution/collection centres for grading, sorting and packaging of farm produce. The goods are procured mainly from the regulated APMC markets and in some cases, directly from growers or consolidators, in which case quality aspects are not being fulfilled. Though the produce purchased from regulated markets meets the quality standards, the commodity trade as of now, is subject to various regulations such as obtaining multiple licenses from each market, paying market fee and high security deposits in the concerned mandis. Forward and futures markets that are emerging fast in the country are also governed by an elaborate regulatory system (FICCI-NCDEX 2007). Notwithstanding these regulations, some of which are likely to be amended, many companies have initiated efficient supply chain management practices by establishing front-end and back-end operations besides creating infrastructure and providing extension services to farmers. Limited evidence on the subject indicates that though these business

models are nascent, they do indicate promising outcomes in terms of increasing market efficiency through lessening of intermediaries, reducing transaction costs, developing infrastructure and realising higher prices to growers by 10-20 per cent compared to the existing marketing channels (GoI 2006). Upton and Fuller (2003) indicated that for every ton of produce sold via e-choupal (an IT-based format), farmers receive higher prices (1-2 $ more) compared to the traditional marketing system. Goel (2006) and Goel, Bhaskaran and Fernandez (2004) have noted that efficient supply chain management of vegetables in Maharashtra and paddy (rice) in Punjab by the private sector has enabled the creation of a stable competitive environment, cope with market imperfections and achieve allocative efficiency.

Conclusion and Further Policy Options

The analysis of market integration across the states, carried out within a framework of multivariate co-integration and error correction model, reveals higher and improved transmission of prices of wheat, rice, sugar and groundnut seed during the nineties compared to the eighties though only in the major crops producing states in India. For cotton and soyabean seed, transmission of price signals across the states is non-existent in the post-reform period. For all the selected commodities, the short-run dynamics captured through error-term reveal low value of co-efficients, indicating a slow speed of adjustment of commodity prices to their long-run equilibrium path. Absence of full/complete spatial market integration, among various factors is attributable to regional bias in the price and procurement policy, partial reforms under the APMC, multiple tax structure, delay in price information across the markets, weak transport and other infrastructural problems. Though there is an increasing evidence that marketing reforms are underway, which would encourage development of alternative marketing platforms such as organised retail, terminal and futures markets besides upgrading existing regulated markets, the pace of policy changes are tardy. It is, therefore, imperative to accelerate the pace of reforms and enhance the diffusion of the emerging models by implementing the following suggestions.

➢ All wholesale markets, which are also spot markets, should have electronic spot markets fully linked with futures for better price discovery, returns, information dissemination and higher vertical and horizontal integration. Till the time futures is strongly embedded in the system, MSP may be continued so as to provide farmers an effective cushion against price shock, if any.

➢ Encourage greater synergies between the spot market, futures market and organised retail by focusing on development of both front-end and back-end operations. This would bring competition, enable price risk management and decision making with respect to crops.

➢ Make India 'One Common Market' by removing/modifying inter-state trade barriers in the movement of agricultural commodities and rationalise entry tax/ octroi /toll taxes under various Acts, viz. APMC and ECA.

➢ Streamline the long chain of intermediaries (either by eliminating or reducing) in the interest of farmers and consumers so that the former gets more of consumer rupee and the latter doesn't have to pay an exorbitant cost.

➢ Introduce single license system and uniformity in the market fee/mandi tax across the states and commodities, and should be payable once in each of the states where mandi transaction takes place.

➢ Allow options trading, which would provide benefits of upside in the movement of commodity prices at the time of settlement of contracts.

➢ Encourage private investments in the entire agri value chain like the creation of cold chains, warehouses, marketing infrastructure, modernisation of spot markets by providing fiscal incentives and making investments eligible for agricultural loans under the priority sector lending. Allowing FDI in food retailing could infuse huge capital and encourage joint ventures.

➢ Extend interest subsidy of 5 per cent under Technology Upgradation Fund (TUF) for textile sector to cotton producing farmers for availing the benefit of lesser interest rate charges.

➢ Market committees should move government to make norms for pledge financing more liberal in the best interest of the farming community.

References

Asche F, H Bremnes and C R Wessells (1999). Product Aggregation, Market Integration and Relationship between Prices: An Application to World Salmon Markets. *American Journal of Agricultural Economics*, LXXXI (3): 568-81.

Acharya, S S (2001). Domestic Agricultural Marketing Policies, Incentives and Integration. In S S Acharya and D P Chaudhri (eds), *Indian Agricultural Policy at the Crossroads*. Jaipur: Rawat Publications.

Ardeni, P G (1989). Does the Law of One Price Really Hold for Commodity Prices?. *American Journal of Agricultural Economics*, LXXI (3): 661-69.

Baffes, J (1991). Some Further Evidence on Law of One Price: The Law of One Price Still Holds. *American Journal of Agricultural Economics*, LXXIII (4): 1264-73.

Bathla, Seema (2006). Trade Policy Reforms and Openness of Indian Agriculture: Analysis at the Commodity Level. *South Asia Economic Journal*, VII (1): 19-53.

——— (2004). Agriculture Market Intervention Policies: Trends and Implications in a New Regime. *Occasional Paper No.34*. Mumbai: NABARD.

Blyn, Goerge (1973). Price Series Correlation as a Measure of Market Integration. *Indian Journal of Agricultural Economics*, XXVIII (2): 56-59.

Brown, R L, J Durbin and J M Evans (1975). Technique for Testing the Constancy of Regression Relationships over time. *Journal of Royal Statistical Society*, XXXVII (2): 149-92.

Chand, Ramesh and Dayanatha Jha (2001). Trade Liberalisation, Agricultural Prices and Net Social Welfare. In S S Acharya and D P Chaudhari (eds), *Indian Agricultural Policy at the Crossroads*. Jaipur: Rawat Publications.

Engle, R F and C W J Granger (1987). Co-integration and Error-Correction: Representation, Estimation and Testing. *Econometrica*, LV (2): 251-76.

FICCI-NCDEX (2007). National Conference for Agriculture Marketing. *Background Paper*, September 20-21. New Delhi.

Gandhi, Vasant P and N V Namboodari (2002). *Marketing of Fruits and Vegetables in India: A Study of the Wholesale Markets in Ahmedabad Area*. Ahmedabad: Centre of Management in Agriculture, Indian Institute of Management.

Goel, Veena (2004). Supply Chain Management and Role of Relationships in Vegetable Industry in Mumbai City of Maharashtra in India. *International Journal of Tropical Agriculture*, XXIV (3-4), July-December.

Goel, Veena, Suku Bhaskaran and Shadwell Fernandez (2004). Vertical Co-ordination and Integration Across the Paddy and Rice Value Chain, Punjab (India). *ASEAN Food Journal*, XIII (4): 181-92.

Government of India (2006). Report of the Sub Group on Agricultural Marketing Infrastructure under the Working Group on Agricultural Marketing Infrastructure and Policy Required for Internal & External Trade for the XI Five-Year Plan. Planning Commission.

Heytens, P (1986). Testing Market Integration. *Food Research Institute Studies*, XX (1): 25-41.

Jha, Raghbendra, K V Bhanumurthy, Hari K Nagarajan and Ashok K Seth (1997). Market Interventions in Indian Agriculture. *RP-97-269*. Mumbai: Indira Gandhi Institute of Development Research.

Johansen, S (1988). Statistical Analysis of Cointegration Vectors. J*ournal of Economic Dynamics and Control*, 12: 231-54.

——— and Katrina Juselius (1990). Maximum Likelihood Estimation and Inference of Cointegration with Applications to Demand for Money. *Oxford Bulletin of Economics and Statistics*, LII (2): 169-210.

Kumar Pramod (2006). Inter Commodity Price Linkages in India: A Case of Fodgrains, Oilseeds and Edible Oils. *Journal of International and Area Studies*, XIII (1): 3-126.

Prasad, Sarjoo (2001). *Essential Commodities Act with Central Control Orders*. New Delhi: Law Publishing.

Rivera-Gonzalez, Gloria and Steven M Helfand (2001). The Extent, Pattern and Degree of Market Integration: A Multivariate Approach for the Brazilian Rice Market. *American Journal of Agricultural Economics*, LXXXIII (3): 576-92.

Upton, David and Virginia Fuller (2003). The ITC E-choupal Initiative. *Harvard Business School Teaching Note*.

Wilson, Edgar J. (2001). Testing Agricultural Market Integration: Further Conceptual and Empirical Considerations Using Indian Wholesale Prices. In S S Acharya and D P Chaudhari (eds), *Indian Agricultural Policy at the Crossroads*. Jaipur: Rawat Publications.

Annexure 1: Progress of Reforms in Agricultural Markets (APMC Act) as on 23.08.07

Sl. No.	Stage of Reforms	Name of States/ Union Territories
1.	States/ UTs where reforms to APMC Act has been done for *Direct Marketing; Contract Farming and Markets in Private/ Coop Sectors*	Andhra Pradesh, Arunachal Pradesh, Assam, Chandigarh, Chhattisgarh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tripura and Uttar Pradesh.
2.	States/ UTs where reforms to APMC Act has been done partially	a) *Direct Marketing:* Haryana and NCT of Delhi. b) *Contract Farming:* Haryana
3.	States/ UTs where there is no APMC Act and hence not requiring reforms	Kerala, Manipur, Andaman & Nicobar Islands, Dadra & Nagar Haveli, Daman & Diu, Bihar* and Lakshadweep
4.	States/ UTs where APMC Act already provides for the reforms	Tamil Nadu
5.	States/ UTs where administrative action is initiated for the reforms	Mizoram, Meghalaya, J&K, Uttaranchal, West Bengal, Pondicherry, Goa and Jharkhand

Source: Based on information obtained from the Directorate of Marketing and Inspection, Ministry of Agriculture, Faridabad. * APMC Act is repealed w.e.f. 1.9.2006.

Annexure 2: Wholesale Markets Selected from Each State

Wheat	Rice	Sugar	Cotton Lint	Groundnut Seed
Bihar- Patna **Gujarat**- Rajkot	**AP**- Hyderabad **Haryana**-Karnal **Karnataka** - Bangalore	**UP**- Hapur **Bihar**- Patna **Punjab** - Jullandhar	**Maharashtra**- Mumbai **Tamil Nadu**- Tirupur	**AP**- Nandyal
Haryana- Karnal **MP**-Indore **Punjab**- Amritsar	**Kerala**- Thiruvanthapurum **Maharashtra**- Mumbai **Orissa**- Bhubneshwar	**Maharashtra**- Mumbai **AP**- Anakapalli		**Gujarat**- Rajkot **Maharashtra**- Mumbai
Rajasthan- Jaipur **UP**- Kanpur	**Tamil Nadu**- Chennai **WB**- Calcutta	**Tamil Nadu**- Chennai	**Soyabean** **Seed**	**Tamil Nadu**- Madras
Karnataka- Bangalore **Delhi**-Delhi	**Bihar**- Patna **Gujarat**- Rajkot **UP**- Kanpur	**Karnataka**- Bangalore	**MP**- Dewas **UP**- Haldwani	**UP**- Kanpur

Annexure Table 3: Normalised Cointegrating Coefficients obtained from Co-integration and Error Correction Model

Wheat	Sample: 1980:04 to 1991:03	Sample: 1991.04 to 2003:03
Constant	--	--
Punjab	--	--
Haryana	-12.39 (20.16)	1.17 (0.14)
Karnataka	-0.29 (1.21)	-0.08 (0.09)
Rajasthan	8.51 (12.62)	-0.70 (0.16)
Uttar Pradesh	5.19 (8.21)	0.53 (0.17)
Rice	**Sample: 1980:10 to 1991:09**	**Sample: 1991:10 to 2002:09**
Constant	--	4.03
Andhra Pradesh	--	--
Karnataka	-0.22 (0.32)	-0.15 (0.14)
Kerala	1.50 (0.46)	--
Orissa	0.13 (0.19)	--
Tamil Nadu	-0.18 (0.20)	-0.77 (0.24)
West Bengal	-0.22 (0.29)	0.34 (0.15)
Haryana	--	0.65 (0.21)
Uttar Pradesh	--	0.05 (0.16)

contd...

Sugar	**Sample: 1980:10 to 1991:09**	**Sample: 1991:10 to 2001:09**
Constant	-0.41	1.83
Uttar Pradesh	--	--
Punjab	0.90 (0.07)	0.16 (0.33)
Karnataka	0.18 (0.05)	-0.10 (0.46)
Tamil Nadu	--	1.64 (0.61)
Bihar	--	1.13 (0.43)
Andhra Pradesh	--	-2.24 (0.85)
Cotton	**Sample: 1982:10 to 1990:09**	**Sample: 1994:10 to 1998:09**
Constant	2.136 (0.978)	-59.48
Maharashtra	--	--
Tamil Nadu	0.529 (0.212)	13.92 (6.74)
Groundnut Seed	**Sample: 1980:11 to 1992:10**	**Sample: 1992:11 to 2003:10**
Constant	0.38 (0.11)	-0.65 (0.22)
Andhra Pradesh	--	--
Tamil Nadu	-0.84 (0.50)	0.86 (0.07)
Uttar Pradesh	0.80 (0.11)	0.19 (0.05)
Soyabean Seed	**Sample: 1982:11 to 1991:10**	**Sample: 1995:11 to 1999:10**
Constant	0.42 (0.47)	0.182 (1.013)
Madhya Pradesh	--	--
Uttar Pradesh	0.91 (0.10)	0.957 (0.218)

Note: Figures in parentheses are the standard errors

Regional Disparity in Service Sector Development in Goa

Radhika Nayak and P K Sudarsan*

Abstract

Service-driven economies are more developed than predominantly manufacturing economies. This paper attempts to understand the regional disparity in the development of service sector in Goa. The study is based on the data collected from the Directorate of Planning, Statistics and Evaluation, Government of Goa. By using simple and composite index numbers, the study grouped all *talukas* in Goa into high, medium and low categories, with respect to service sector development. The results show that there is a wide disparity in service sector development in Goa. The study has far-reaching implications as Goa is one of the most developed states in India.

Introduction

Economists now view poverty, unemployment and inequality as a grave threat to economic development, as they subscribe to the belief that economic development means an improvement in the quality of life. There is no denying the fact that there is a development gap not only between nations but also within them, as well as within the sub-regions of the nations, which varies among regions. Any analyses of the causes of such development gaps reveal that service sector-driven economies are more developed than predominantly manufacturing economies (Kuznets 1955). It is evident that economies or regions in which the service sector plays a more active role in contributing to economic development show a much higher level of development than in those in which the manufacturing sector plays a more dominant role.

Goa is one of the most developed states in India. More than 50 per cent of the GDP of the State comes from the service sector, in which tourism-related activities are predominant. Linkage of other service activities to the tourism sector is extremely high in Goa. However, tourism is not evenly spread throughout the State and is causing a development gap within the region.

This paper is an attempt to understand regional disparity in the service sector development in Goa.

* Radhika S Nayak is Lecturer in Economics in Carmel College for Women, Nuvem, Salcete, Goa; P K Sudarsan is Reader, Department of Economics, Goa University, Goa.

Development and Inequality: The Role of Service Sector

It was the new welfare-oriented approach to economic development which began to emphasise that economic development could not be viewed merely as a quantum of growth in GDP on a sustained basis or a structural transformation, from predominantly primary sector-led growth to a manufacturing or service-driven economy. Economists began to emphasise the elimination of poverty and unemployment, reduction of inequalities and the need for redistribution of income and wealth together with economic growth (Viner 1963, Kindleberger and Herrick 1977). It seemed quite a paradox to consider an economy as developed merely on the strength of its growing per capita income if it was accompanied by a growth in poverty, unemployment and inequality. What is important is the content of GNP rather than its rate of growth. In fact, modern economists began to view economic development as "multidimensional change" in the quality of life which could be regarded as "materially and spiritually better" (Todaro 2000).

It became imperative, therefore, to understand how some economies are able to bring about the necessary 'multidimensional change' and why others lag behind. Writing about the role of the service sector in world development, Dorothy Riddle (Riddle 1986) formulated the interactive model of an economy, which emphasises that services are not peripheral activities but rather an integral part of the society. Services are central to the functioning of a healthy economy. It is observed that the service sector not only facilitates but also makes possible the goods producing activities of the extractive and manufacturing sectors, emerging therefore, as a crucial force contributing to development, change and regional disparities.

It is a fact that the world's developed economies are in general service-oriented economies. The economies of countries like the US, UK, Japan, Canada, Sweden etc. have changed from being goods-dominated to service-dominated, and are identified now as service economies. Hong Kong and Singapore, the new service economies of the world, have become much richer than their colonial master, Britain, with Hong Kong's service sector contributing a mammoth 84 per cent of the GDP and Singapore's, a healthy 65 per cent (Venugopal and Raghu 2001).

India is also adopting the service sector-driven route to development. In fact, in the new millennium, India is witnessing the beginning of a major Schumpeterian technological revolution in the tertiary or the services sector, (Brahmananda 2001), which has become the largest single contributor to the GDP. The Reserve Bank of India also has, for the first time, taken note of this surge of the service sector in India and has discussed the implications of the rapidly growing service sector on various economic issues (RBI Annual Report 1988-89).

However, it is equally important to observe that it is this unequal sectoral development that is resulting in a development gap within the country, not just across the sectors but across regions too. This argument was substantiated by the study undertaken by N J Kurian (2000), which showed the emerging trends in 15 major states in the country, which together account for 96 per cent of the population. The key parameters in the study, which have an intrinsic bearing on social and economic development, gave an insight into the problem of regional disparities in India. The study groups the 15 states under consideration into two categories: (i) forward group, and (ii) a backward group. It reveals that the marked dichotomy evident between the 'forward' and 'backward' groups of states can be attributed in good measure to differences in the development of the social services, literacy, health indicators, per capita incomes, etc.

Intra-state or sub-region studies conducted in Karnataka also emphatically concluded that sectoral development patterns exhibited concentration of economic activities in the 54 developed *talukas* (out of the 175 *talukas* taken up for study) which had better infrastructure facilities such as transport, communication, banking etc., and therefore attracted entrepreneurial ability; the 106 'backward' *talukas* were found to be disadvantaged in terms of sectoral development (Rao 1984).

Service Sector Growth and Development Gap in Goa

Although Goa was ranked as the number one state among the 19 states under consideration (Debroy and Bhandari 2003) giving importance to both business environment and quality of life, and the Directorate of Planning, Statistics and Evaluation, Government of Goa, reiterates the findings of the of the above study (Govt. of Goa 2004 a) by ranking Goa high among the states in India, the fact is that the 'development gap' exists in Goa. It is more than evident to any close observer of Goa that the level of development of the coastal regions (*talukas*) is disproportionately higher than that of the interior *talukas* in the State.

Since Goa has been experiencing, in recent years, service sector-driven growth, the present paper is an attempt to understand the regional imbalance in the service sector growth. Tourism is a major economic activity in Goa and a major contributor to the service sector growth.

Data and Methodology

This study is based on the secondary data collected from the Directorate of Planning, Statistics and Evaluation, Government of Goa. The study used the data from the years 1990 and 2005 to compare inequality in the service sector growth at two points in time. The study considered these two points of time, 1990 and 2005, because in 1990 Goa had completed three years of statehood and 2005 is the year for which latest data were available. The study takes into account five categories of

service activities, namely, Education (E), Public Health (PH), Banking (B), Communication (C) and Tourism (T). This study has included 27 variables spread across the above five categories. The unit of study is the *taluka*. All the 11 *talukas* in the State of Goa have been covered.

The major statistical tool used is the index number. The study used simple index and composite index to measure the differences in the growth of five categories of service activities among the 11 *talukas*. Each variable under each category of study will have 11 observations representing 11 *talukas*. Each variable in each category is first converted into the index form by taking the average value of that variable as the base, across all *talukas*. Then each value (index) of these variables for a particular *taluka* is combined to get the 'combined index'. For example, Number of Schools (NS) is a variable with 11 observations under the category 'Education'. The variable 'Number of Schools (NS)' is converted into a variable of 11 indices. This conversion is made by dividing the number of schools of each *taluka* by the average number of schools (SNS/11) and multiplying the same by 100. The average number of schools is the base in constructing the index. Suppose there are eight variables like NS in the category of 'Education', then there will be eight indices for each *taluka*. These eight indices are combined to get one index value, representing education, for each *taluka*. Therefore, there will be 11 such indices for 11 *talukas* in Goa, representing the category of Education as a sub-service sector.

The procedure for preparing the 'combined index' is illustrated in the table below.

	Variables in Index Form					
Talukas	1	2	3	....	8	Combined Index (Education)
1	1_1	1_2	1_3		1_8	$E1 = (1_1 + 1_2 + \ldots 1_8)/8$
2	..	..	...		...	
..	..	..	...		...	
..	..	..	...		...	
11	11_1	11_2	11_3	....	11_8	$E11 = (11_1 + 11_2 + \ldots 11_8)/8$

$1_1, 1_2 \ldots 1_{11}$ given in columns are the indices of 11 *talukas* of one particular variable.

$1_1, 1_2 \ldots 1_8$ given in rows are the indices corresponding to different variables of a particular *taluka* 1.

$E_1, E_2 \ldots E_{11}$ are the combined index for education (E), for different *talukas*. Similarly, indices for other categories of services, PH, B, C and T are also prepared.

The composite index for the whole service sector for a particular *taluka* will be

$$SSI = \frac{E + PH + B + C + T}{N}$$

Where,

SSI   =   Service Sector Index

N   =   Number of Service categories

Results And Discussion

Results of the study are presented in Tables (1), (2), (3), (4), (5) and (6), and is discussed under different service category headings such as education, public health, banking, communication, tourism and composite service sector index. Tables (1) and (3) show the indices and corresponding ranks of different service categories. Tables (2) and (4) show categorisation of *talukas* into high, medium and low developed on the basis of the ranks.

Top-ranked three *talukas* are highly developed *talukas* and low-ranked three *talukas* are low developed *talukas* while all others are under the medium category. Table (5) presents the composite service sector index and Table (6) categorisation of *talukas* on the basis of ranks of the composite index.

Education

Education is an extremely important service activity in Goa. The per capita expenditure on education is Rs 1,618, that is, second only to Sikkim among states and Union Territories of India. Goa ranks 4th as far as state-wise literacy rates are concerned (82.32 per cent) after Kerala, Mizoram and Lakshadweep (Government of Goa 2004).

Table-1: Indices of Service Sector Components in Goa: 1990

Taluka	1990									
	Education		Health		Banking		Communication		Tourism	
	Index	Rank	Index	Rank	Index	Rank	Index	Rank	Index	Rank
North Goa										
Tiswadi	161	3	284	1	198	3	210	3	416	1
Bardez	169	2	156	3	237	1	220	1	303	2
Pernem	52	8	71	6	32	8	43	8	3	7
Bicholim	75	6	29	11	65	6	48	7	2	8
Sattari	41	10	45	9	25	9	37	11	0	9
Ponda	139	4	78	5	83	5	90	5	21	5
South Goa										
Sanguem	43	9	62	7	58	7	40	9	4	6
Cancona	34	11	47	8	32	8	39	10	3	7
Quepem	61	7	35	10	32	8	56	6	2	8
Salcete	237	1	184	2	234	2	214	2	257	3
Murmugao	88	5	111	4	104	4	105	4	89	4

While constructing the access to education index, 10 parameters were considered. The variables included in Education (E) under the service sector are the number of schools and number of students in primary, middle, secondary and higher secondary level and in colleges and universities.

Table-2 Indices of Service Sector Components in Goa: 2005

Taluka	2005									
	Education		**Health**		**Banking**		**Communication**		**Tourism**	
	Index	**Rank**	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**	**Index**	**Rank**
North Goa										
Tiswadi	158	3	239	1	215	3	161	3	239	3
Bardez	171	2	157	3	232	1	218	2	433	1
Pernem	58	8	47	7	35	8	50	7	35	5
Bicholim	80	6	51	6	50	6	47	8	5	8
Sattari	48	9	33	9	26	9	53	6	0	10
Ponda	132	4	100	5	102	5	109	4	22	6
South Goa										
Sanguem	43	10	51	6	26	9	40	10	2	9
Canacona	42	11	32	10	40	7	39	11	18	7
Quepem	60	7	42	8	40	7	42	9	0	10
Salcete	214	1	219	2	229	2	246	1	271	2
Murmugao	94	5	129	4	109	4	95	5	75	4

The Tables (1) and (2) show education index for all 11 *talukas* for the years 1990 and 2005 and the corresponding ranks for the respective years. The categorisation of *talukas* on the basis of ranks into low, medium and highly developed *talukas* is given in Tables (3) and (4).

The indices show that Salcete *taluka* in South Goa is the highest ranked *taluka* in 1990 as well as in 2005. Canacona *taluka* in South Goa ranks the lowest, both in 1990 and in 2005. It is observed that out of the top five *talukas*, three are located in North Goa as against two in South Goa. The results also show that over the 15-year period, absolutely no change has occurred in the categorisation of the *talukas*, though there is a minor shuffle of ranks within the categories.

It is interesting to note the all the highly developed *talukas*, Salcete, Bardez and Tiswadi, are coastal *talukas* whereas the ones in the low development category are the hinterland *talukas*, with the exception of Canacona, in South Goa and Pernem in North Goa, which are coastal *talukas* but have been low on the development index on account of their remoteness from the hub of economic and political activities. Poor accessibility to these areas has also contributed to their poor performance on development indicators.

Table-3 : Categorisation of *Talukas* on the Basis of Ranks: 1990

Service Sector	Categorisation on the basis of ranks		
Components	**High**	**Medium**	**Low**
Education	Salcete, Bardez, Tiswadi	Ponda, Murmugao, Bicholim, Quepem, Pernem	Sanguem, Sattari, Canacona
Health	Tiswadi. Salcete Bardez	Murmugao, Ponda, Pernem, Sanguem, Canacona	Sattari, Quepem, Bicholim
Banking	Bardez, Salcete, Tiswadi	Murmugao, Ponda, Bicholim, Sanguem	Pernem, Canacona, Quepem, Sattari
Communication	Bardez, Salcete, Tiswadi	Murmugao, Ponda, Quepem, Bicholim, Pernem	Sanguem, Canacona Sattari
Tourism	Tiswadi, Bardez Salcete	Murmugao, Ponda, Sanguem, Pernem, Canacona	Bicholim, Quepem, Sattari

Table-4: Categorisation of *Talukas* on the Basis of Ranks: 2005

Service Sector	Categorisation on the basis of ranks		
Components	**High**	**Medium**	**Low**
Education	Salcete, Bardez, Tiswadi	Ponda, Murmugao, Bicholim, Quepem, Pernem	Satteri, Sanguem, Canacona
Health	Tiswadi, Salcete Bardez	Murmugao, Ponda, Bicholim, Sanguem, Pernem	Quepem, Sattari, Canacona
Banking	Bardez, Salcete, Tiswadi	Murmugao, Ponda, Bicholim, Canacona, Quepem	Pernem, Sattari, Sanguem
Communication	Salcete, Bardez Tiswadi	Ponda, Murmugao, Sattari Pernem, Bicholim	Quepem, Sanguem Canacona
Tourism	Bardez, Salcete Tiswadi	Murmugao, Pernem, Ponda, Cancona, Bicholim	Sanguem, Quepem Sattari

Public Health

Goa has one of the most extensive health systems in India. The per capita expenditure on Health is Rs 544, second only to Sikkim among states and Union Territories of India (Government of Goa 2004).

Eight parameters have been taken into consideration to construct the publichealth facilities index. The variables covered in Public Health (PH) under the service sector are broadly the number of specialised and general hospitals, number of community primary health centres, number of beds in government hospitals,

number of private hospitals, number of beds in private hospitals, number of dispensaries (r.m.d.), number of urban health centres, and number of sub-health centres.

The indices given in Tables (1) and (2) show that Tiswadi *taluka* is ranked highest in both 1990 and 2005. The lowest ranking *taluka* in 1990 is Bicholim in North Goa and Canacona in South Goa in 2005. Although the *talukas* in the highly developed category remained unchanged in their ranks from 1990 to 2005, it is distressing to note that Canacona, which was in the medium development category in 1990, has been pushed down to the low development category in 2005. However, Bicholim does move up into the medium development category from 1990 to 2005. The difference in the indices of the *talukas*, ranked top three in comparison to the bottom three, is glaring and immediately draws attention to the 'gaps' in access to public health facilities across the State. Even within the category, there are large differences in the indices. Again, it is the coastal *talukas* of Tiswadi, Salcete and Bardez which are in the highly developed category. However, the coastal *taluka* of Canacona stands out as an exception and joins the hinterland *talukas* of Quepem and Sattari in being worse off.

Banking

Banking facilities in Goa have witnessed tremendous growth, with the number of branches increasing considerably in the last two decades. As on 31.3.2003, there were 447 banking offices in Goa, of which 320 were commercial banks and 127 co-operative banks. Goa has an extremely high rate of savings, with the per capita bank deposit as high as Rs 79,333. However, the per capita credit was relatively low at Rs 24,284 for the year 2002-03 (Government of Goa 2004).

The banking index is constructed by taking into consideration only one parameter, the availability of this service in the *taluka*. The variable used in Banking (B) under the service sector is the number of scheduled commercial banking offices in the respective *talukas*.

Tables (1) and (2) show access to banking index for the 11 *talukas* for the years 1990 and 2005, and the corresponding ranks for the same years respectively. The categorisation of *talukas*, on the basis of rank, is given in Tables (3) and (4). The indices show that Bardez in North Goa was ranked highest in 1990 and continued at the same rank in 2005. Also, the three *talukas* in the high-ranking categories remain the same in 1990 and 2005. It is pertinent to note that there has been a movement from the medium category to the low category. Sanguem, which was in the medium category in 1990, finds itself worse off in the low category in 2005. However, Canacona and Quepem, which were in the low category in 1990, moved up to the medium category in 2005. What remains unchanged, however, is the glaring difference in indices of the top three *talukas* compared to the bottom three.

Communication

The communication network in Goa, as elsewhere in the country, has taken a quantum leap with both the government and private operators expanding the area and extent of their operations. While constructing communication index, five parameters were taken into consideration. The variables covered under the category of Communication (C) under the service sector are broadly the number of post offices in urban and rural areas, the number of telegraph offices and the number of telephones in use.

Tables 1 and 3 show the communication index for the 11 *talukas* for the years 1990 and 2005, and the corresponding ranks in the respective years. Categorisation of the *talukas* on the basis of ranks into low developed, medium and highly developed *talukas* is given in Tables 2 and 4. The indices show that while Bardez in North Goa ranks highest in 1990, it is Salcete in South Goa that tops the rank in 2005. Sattari in North Goa, which ranked lowest in 1990, moved up to 6th rank in 2005, whereas Canacona in South Goa, which figured 10th in the rankings in 1990, was pushed down to the 11th position in 2005. While there is a minor shuffle in the rankings of *talukas* in all categories, an inter-category shift is observed in the case of Quepem, which was in the medium developed category in 1990, ranking 6th, but dropped to the 9th rank and, therefore, to the low developed category in 2005; whereas, Sattari, which was in the low developed category in 1990 ranked last, moved into the medium developed category in 2005. This can be explained by the attention that this *taluka* received on account of being represented by the Chief Minister of the State for a number of years. What is again pertinent to note is that there is a drastic difference in the indices of the top three *talukas* and the bottom three *talukas* .

Tourism

Tourism is the most important component of Goa's economy and plays an important role in the socio-economic development of the State. From an estimated 2 lakh tourist arrivals in 1990, the tourist traffic, both domestic and foreign, crossed 24 lakhs in 2005, which is more than the local population of the State itself (Government of Goa 2005b).

While constructing the tourism index, three parameters were considered. The variables included under Tourism (T) under the service sector are broadly the number of hotels and lodging houses and the number of domestic and foreign tourist arrivals.

The indices are presented in Tables 1 and 2. Categorisation of *talukas* on the basis of ranks is given in Tables 3 and 4. The indices show that the highest rank is gained by the coastal Tiswadi *taluka* in North Goa in 1990. It has been displaced by Bardez, also a North Goa coastal *taluka* in 2005, followed closely by Salcete in South Goa for the years under consideration. These three *talukas* show indices

which are tremendously higher than the other eight *talukas*, with Sattari *taluka*, in North Goa, a hinterland region, showing zero access in 1990 and 2005. Quepem *taluka* in South Goa, a mid-land region, also shows zero access in 2005. Canacona in South Goa, a coastal *taluka*, is a peculiar case as it defies the generalisation of high development in coastal *talukas*, with an extremely low index of 3 in 1990. The drastic difference in the tourism facilities is highly conspicuous in these indices. The categorisation of *talukas* remains unchanged for the highly developed *talukas*, while there is minor shuffling in ranks in the other two categories. It is interesting to note that there is a notable increase in indices for coastal *talukas* of Pernem in North Goa and Canacona in South Goa from 1990 to 2005 which could be due to the conscious efforts to disperse tourism to the less known beaches and away from the overcrowded coastal areas in Bardez, Salcete and Tiswadi. Another noteworthy observation is that Tiswadi has shown a drastic fall in index from 1990 to 2005, reflecting a diminishing tourist attraction to this *taluka*. Bardez, however, has increased its index tremendously from 1990 to 2005, which is easily explained by the concentration of tourism-related activities in the area.

It is apparent that in the 15 years under consideration, there has been no deliberate effort on the part of the policy makers to shift emphasis from beach tourism to other areas of tourism so as to allow the hinterland and midland *talukas* to benefit from tourism-led growth.

Composite Service Sector Index

A composite service sector index is constructed for the five categories of service activities taking into consideration 27 parameters in Goa for the years 1990 and 2005. The indices are presented in Table 5. The Table shows the composite access to services in the five categories of services under consideration for the 11 *talukas* for the years 1990 and 2005, and the corresponding ranks for the respective years. Categorisation of the *talukas* on the basis of ranks into low developed, medium and highly developed *talukas* is given in Table 6. The location of these *talukas* is given below in the maps for the years 1990 and 2005.

The indices establish that the three coastal *talukas*, Tiswadi, Salcete, Bardez, were the highly developed ones in both 1990 and 2005. However, the rankings of the *talukas* in 2005 shift -- while Tiswadi is the highest ranking *taluka* in 1990 in the high category, in 2005 it is Bardez *taluka* which moves up from the third place in the high category in 1990. Consequently, Tiswadi is pushed down to the third rank in the high category in 2005 while Salcete retains its second rank in the highly developed category, both in 1990 and 2005.

It is noteworthy that the coastal *taluka* of Canacona, which was in the low development category in 1990, managed to enter the medium development category in 2005. This does not change the fact that Canacona *taluka* in the extreme south of Goa and Pernem *taluka* in the extreme north of Goa have lagged in the development

process due to poor accessibility; the *talukas* are far from both the airport as well as railway junctions; infrequent road transport and remoteness from commercial hubs have made Canacona and Pernem exceptions to the other highly developed coastal *talukas* in Goa.

Table-5: The Composite Index for the State of Goa: 1990 and 2005

Taluka	Composite Index and Ranks for Service Sector			
	1990		**2005**	
	Index	**Ranks**	**Index**	**Ranks**
North Goa				
Tiswadi	254	1	202	3
Bardez	217	3	242	1
Pernem	40	8	45	7
Bicholim	44	6	47	6
Sattari	30	11	32	10
Ponda	82	5	93	5
South Goa				
Sanguem	41	7	32	10
Canacona	31	10	34	8
Quepem	37	9	37	9
Salcete	225	2	236	2
Murmugao	99	4	100	4

Table-6: Categorisation of *Talukas* on the Basis of Ranks: The State of Goa

High		Medium		Low	
1990	**2005**	**1990**	**2005**	**1990**	**2005**
Tiswadi	Bardez	Murmugao	Murmugao	Quepem	Quepem
Salcete	Salcete	Ponda	Ponda	Canacona	Sattari
Bardez	Tiswadi	Bicholim	Bicholim	Sattari	Sanguem
		Sanguem	Pernem		
		Pernem	Canacona		

What is of considerable interest in the context of this paper is the drastic divergence in the levels of tertiarisation and the consequent "gap" in the levels of development of the *talukas* in the highly developed category as compared to those in the low category. Except for a minor shuffle in rankings from 1990 to 2005 within the respective categories, the only noticeable change is Canacona securing a place for itself in the medium development category in 2005 and Sanguem being pushed

down into the low development category in the same year. Otherwise, the categorisation remains unchanged over the period of 15 years, right from three years after the declaration of statehood for Goa, i.e., from 1990 to 2005.

Categorisation and Ranks of *talukas* in 1990 and 2005
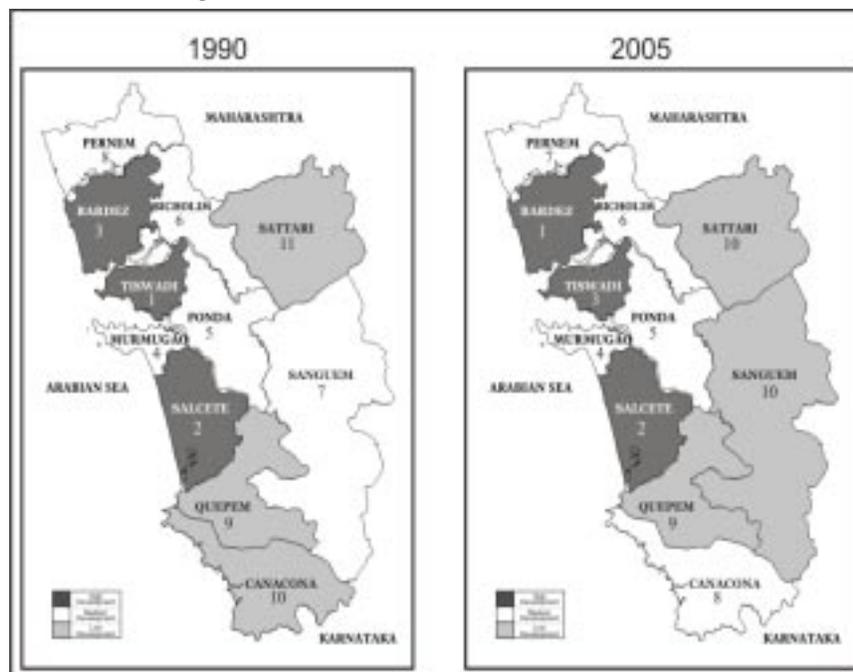
The extent of inequality that exists among different *talukas* can be understood from the difference in the composite service sector index between the top ranked and bottom ranked *talukas* in 1990 and 2005. In 1990, the difference is 224 (254-30) and in 2005, it is 210 (242-30). Thus, in 1990 and 2005, the top ranked *taluka* had more than eight times service sector growth than the bottom ranked *taluka*.

Summary and Conclusion

Goa is one of the most developed states in India. The share of the service sector in the state domestic product is more than 50 per cent. The rate of growth of service sector in recent years is very high compared to the other sectors of the economy. The present study attempted to understand the regional disparity in service sector growth in Goa.

Major findings of the study are: i) There is a wide disparity between different *talukas* with respect to service sector growth, ii) All categories of service

sector show almost the same pattern of inequality among the *talukas*, iii) Coastal *talukas* in general show higher growth rate compared to hinterland *talukas*, iv) The extent of inequality between *talukas* is very high, and, v) The inequality has not reduced much during the 15-year period from 1990 to 2005.

It is a fact that in Goa, the three *talukas* of Tiswadi, Salcete and Bardez are highly developed compared to the other *talukas*. The findings of the paper are pertinent in that they substantiate the trend observed world over: high rate of development coincides with the growth of the service sector. It may be concluded from the study that it is unequal growth and development of service sector which is to a large extent responsible for inequalities in the development of various *talukas* in Goa. This unequal service sector growth can be attributed, to a large extent, to the uneven development of tourism activities. Tourism activities in Goa are highly skewed, being concentrated only in the three *talukas* of Bardez, Tiswadi and Salcete. Since tourism is the main driving force behind the economic growth in Goa, this unequal growth needs to be addressed with utmost seriousness.

A matter that must be of great concern for the government and the people of Goa is that the regional disparity has not come down substantially over the last 15 years. The study has many policy implications, both short term and long term, as far as the Government of Goa is concerned. The questions that are bound to arise are whether the service sector, or rather the tourism sector, driven growth strategy is desirable and what needs to be done to reduce the disparity as it exists today.

References

Brahmanada, P R (2001). Thoughts On The New Tertiary Revolution. In Bhalchandra L Mungekar, Dilip M Nachane and M J Manohar Rao (ed), *Indian Economy in The New Millenium*. Mubai: Himalaya Publishing House.

Debroy Bibek, Lavished Bhandari (2003). *State of States*. New Delhi: Indicas Analytics.

Government of Goa (2004a). Directorate of Planning and statistics Evaluation, Panaji. *Economic Survey 2003-04*.

——— (2004b). Department of Tourism, Panaji. *Tourist Statistics, Goa, India*.

Kindleberger, Charles P and Bruce Herrick (1977). *Economic Development*. New York: Mc Graw-Hill.

Kurian, N J (2002). Growing Inter-State Disparities : India 2001. *Seminar 509.* January, 2002.

——— (2000). Widening Regional Disparities in India : Some Indicators. *Economic and Political Weekly*, XXXV (7): 538-50.

Kuznets, Simon (1955). Economic Growth and Income Inequality. *American Economic Review*, XLV (1): 1-28.

Rao, Hemlata (1984). *Regional Disparities and Development in India*. New Delhi: Ashish Publishing house.

RBI (1989). *RBI Annual Report 88-89*. Bombay: Reserve Bank of India.

Riddle, Dorothy L (1986). *Service Led Growth : The Role Of The Service Sector In World Development*. New York: Praeger.

Todaro, Michael P (1983). *Economic Development in the Third World*. New York: Longman Inc.,

Venugopal, Vasanti and V N Raghu (2001). *Services Marketing*. Mumbai: Himalaya Publishing House.

Viner, Jacob (1963). The Economics of Development. In A N Agarwal and S P Singh (eds), *The Economics of Underdevelopment*. New York: OUP.

Oil Price Fluctuations, Exchange Rate Depreciation and Industrial Sector Output in Nigeria: Theory and Empirical Evidence

Hassan E Oaikhenan and Raphael I Udegbunam*

Abstract

The paper examines empirically the impact of fluctuations in oil prices and exchange rate depreciation on industrial sector output in Nigeria. Inflation rate, energy supply gaps, interest rate and domestic income level were utilised as additional explanatory variables in the model specified and estimated. The estimation was carried out with the OLS regression technique, using the MFIT4.1 computer software package. The model estimation entailed testing for unit root properties in the variables in the specification and the estimation of the model using the variables in the form in which they passed the unit root test. The empirical results indicate that oil price fluctuations, exchange rate depreciation and energy supply shortages impacted adversely on the output of the industrial sector in Nigeria. The impact of oil price fluctuations and exchange rate depreciation was statistically significant while that of energy supply deficiency was weakly significant. All the other variables, except inflation rate, were well behaved in terms of sign and statistical significance.

Introduction

The Nigerian economy depends precariously on crude oil earnings to keep moving. The dependence of the economy on the oil sector is so critical and pervasive that crude oil earnings largely determine the magnitude and direction of key macro-economic aggregates. Specifically, crude oil earnings constitute approximately 90 per cent of federal government's total collectable revenue and 96 per cent of total export earnings. It averaged about 41 per cent of the country's GDP between 1999 and 2003.

The consequence of the foregoing is that the behaviour of the country's exchange rate is affected critically by the earnings from the oil sector. In addition, the Nigerian economy, being a highly open one, depends on imports to meet its

* Hassan E Oaikhenan and Raphael I Udegbunam are with the Department of Economics and Statistics, University of Benin, Benin City, Nigeria. Email: hassanoaikhenan@yahoo.com; and rudegbunam2002@yahoo.com.

essential needs. The available data in this connection show, for example, that the country's openness co-efficient (defined as the ratio of the sum of imports and exports to GDP) averaged 0.82 or 82 per cent between 1999 and 2003 (see for example, CBN; 2003). Moreover, the import-dependent nature of the economy bears heavily on the level of activities in the industrial sector in the light of the sector's overwhelming dependence on imports to meet its critical input requirements.

In recent times, key macro-economic indicators in Nigeria have exhibited mixed behaviour. For example, the country's BOP position, which had a healthy surplus balance of $ 3090.4 million in 2000, deteriorated to a mere $ 221.0 million in 2001 and further to a deficit balance of $ 4363.7 million in 2002. Similarly, the country's overall fiscal balance as a percentage of the GDP deteriorated from 6.3 per cent in 2000 to a mere 0.4 per cent in 2001 and further to a deficit of -8.9 per cent in 2002. In the same way, the average exchange rate of the Naira to the Dollar collapsed from N 76.8 in 1998 to N 92.3 in 1999 and to N 101.7 in 2000. It deteriorated further to N 111.9 in 2001 and to N 120.5 in 2002. At the same time, the country's index of industrial production, which stood at 145.3 in 1999, virtually stagnated at the level through 2003.

The foregoing trends in the behaviour of the country's macro-economic aggregates have been recorded within the context of observed swings in crude oil prices. It is thus, hardly surprising to find commentators on the Nigerian economy attributing the adverse trends in key macro-economic aggregates to the observed fluctuations in oil prices. A number of studies have sought to ascertain the impact of crude oil earning fluctuations on the Nigerian economy (see for example, Obadan 1986). However, none has focussed specifically on empirically x-raying the impact of the instability in oil prices as well as the observed deterioration in the exchange rate on the behaviour of industrial sector output in the economy. The critical importance of the industrial sector of the Nigerian economy, the dependence of the sector on imported inputs in the face of a deteriorating exchange rate position, as well as the dependence of the entire economy on a single export commodity, the price of which has fluctuated considerably in recent times, underscores the need to examine the influence of factors thought relevant to explaining the level of activities in the sector. This is where this paper attempts to make a contribution.

In what follows, we devote Section 2 to a brief survey of the related literature; Section 3 examines the theoretical considerations underlying the model to be specified in the study as well as the specification of the model to be tested empirically. Section 4 contains empirical analysis of the estimated model. Section 5 contains a summary of the paper and some recommendations, while Section 6 contains the concluding remarks.

Survey of Related Literature

The literature on the impact of the behaviour of oil prices on the macro-economy is rich, given the extensive volume of research that have examined the problem. Concerns about the effects of oil price shocks on the macro-economy were first triggered by the oil crisis of 1973. Among the early studies that were conducted to ascertain the link between oil price shock and the macro-economy were Pierce and Enzler (1974), Rasche and Tatom (1977), Mork and Hall (1980), Darby (1982), and Tatom (1987). Tatom (1987), for example examined, *the macroeconomic effects of the recent fall in oil prices*. Among other things, he sought to ascertain the effects of oil price shocks on real GNP, productivity and the rate of price increase. His findings showed among others that decline in oil prices result in a rise in output and a reduction in prices.

Empirical evidence adduced by other researchers like Gisser and Goodwins (1986)and Hickman *et al* (1987) also confirmed the existence of an inverse relationship between oil price changes and aggregate economic activity using U.S. data. In addition, studies by Darby (1982), Burbridge and Harrison (1984) and Bruno and Sachs (1981, 1985) produced similar empirical evidence for other countries.

Further efforts at exploring the relationship between oil price behaviour and the macro-economy have assumed the form of dividing oil price changes into its positive and negative components. Mork (1989), for example, followed this line of research and he was able to establish the existence of a significant relationship between oil prices and aggregate output. Mory (1993), in the same way, was able to establish that positive oil price shocks affected the behaviour of macro-economic variables while negative shocks did not. In addition, empirical evidence from the work of Ferderer (1996) showed that increases in oil prices explained more than twice, the variation of industrial output growth than the decrease in prices. In his view, uncertainty about oil prices can also adversely affect economic activity by reducing the investment demand.

More recently, Hamilton (1996, 1999) conducted empirical studies in which he introduced the concept of *net oil price*. Empirical evidence contained in the results of his studies further underscored the existence of a statistically significant and stable negative relationship between oil prices and the output of the macro-economy.

Brown and Yucel, in a recent paper, note that a considerable body of economic research suggests that oil price fluctuations have featured prominently in national economic activity since World War II. In underscoring the role of oil price fluctuations in economic activity, they point out that rising oil prices preceded eight of the nine post- World War II recessions, noting that beyond establishing a relationship between oil price movements and aggregate economic activity, the research on economic response to oil price shocks has gone in several directions,

one of which is ascertaining why rising oil prices appear to retard aggregate economic activity more than by falling prices. They also note that another strand has gone along the direction of investigating the channels through which oil price shocks are transmitted to economic activity.

It is noteworthy that much of the existing body of empirical evidence, such as those reviewed above, have basically been the outcome of research efforts aimed at investigating the impact of oil price fluctuations on the developed net oil importing countries. Relatively less effort has, however, been devoted to investigating the impact of oil price fluctuations on the economies of developing countries like Nigeria. Yet, it is reasonable to expect that fluctuations in oil prices should impact their economies, irrespective of whether they are oil importers or exporters. This paper seeks to contribute to the growing literature on the impact of oil price fluctuations on industrial output and on the factors that affect the level of output of the sector.

Some Theoretical Considerations

The literature offers substantial guidance on the factors that bear on the behaviour of industrial sector output. Accordingly, a number of factors that bear on the performance of the industrial sector can be identified in the literature. Although, it is appropriate to examine the influence of traditional factors like inflation, lending rate, income etc. as predictors of industrial sector output, the critical role of crude oil earnings in determining the direction of key macro-economic aggregates, especially in the Nigerian economy, makes an understanding of the impact of instability in oil prices on the macro-economy imperative. More specifically, our objective in this paper is to verify empirically, the salutary nature or otherwise of the impact of the observed instability in oil prices, which was engendered by various developments in oil market, as well as a battery of other relevant variables on the output of the industrial sector of the Nigerian economy.

Nigeria is a member of the OPEC, an organisation that, *derives its power from the fact that its members own two-thirds of known petroleum reserves* (Danielson 1982). OPEC's primary objective is to stabilise the prices of the commodity to the benefit of oil producing and consuming countries (Lukman 1995). Although the organisation has accomplished this objective with a remarkable degree of success, it is nevertheless true that oil prices have, at various periods within the life of the organisation, been characterised by instability. It is, therefore, appropriate to ascertain the impact of such instability on industrial output of the Nigerian economy.

Oil Price Instability and Industrial Sector Output

According to Obadan (1986), *a priori* reasoning considers the effect of export instability detrimental. Given that Nigeria's export table is dominated by oil

exports, so much so that exports from Nigeria are virtually synonymous with crude oil exports, it is appropriate to narrow the above assertion to the behaviour of the oil exports. Accordingly, it can be argued that *a priori* reasoning considers the instability in oil prices on the country's industrial output detrimental. The reasoning here is that instability in oil prices has the potential to engender a reduction in oil export earnings, with its attendant deleterious impact on various macro-economic aggregates, including the industrial sector output.

It is, however, possible to argue that the foregoing notwithstanding, the deleterious nature of oil price fluctuations on macro-economic aggregates is an empirical issue. The reasoning here is that whether oil price fluctuations help or hurt macro-economic aggregates is dependent on whether or not such fluctuations have been in the positive (favourable) or in the negative (unfavourable) direction.

Positive fluctuations in oil prices, expectedly, should impact favourably on the macro-economy. Negative fluctuations, on the other hand, would, in all likelihood, impact adversely (and perhaps, severely, depending on the magnitude of the fluctuation) on macro-economic aggregates. On balance therefore, the theoretical position is that whether fluctuations in oil prices impact positively or negatively on the macro-economy and its key aggregates depends largely on which of the two (positive or negative fluctuations) exert a greater influence on the economy. Dornbusch and Fisher (1999) have noted in this connection, for example, that, *an adverse oil supply price shock should increase (such macro-economic aggregates as) the price level and decrease GNP as well as decrease the real wage while a favourable oil price shock should reduce the price level, increase GNP and raise the real wage*. According to them, *the relevant (oil price) shock in the mid-1980s was a favourable one*. It is against the foregoing background that we deem it appropriate to go beyond intuition, hunches and guess work in the analysis of the impact of the observed fluctuations in oil prices on the industrial sector of the Nigerian economy. This entails bringing quantitative tools to bear on the analysis.

Exchange Rate Depreciation and Industrial Sector Output

In addition to fluctuations in oil prices, we deem it appropriate to ascertain the impact of the behaviour of the country's exchange rate, which has manifested largely in persistent and unidirectional depreciation on the output of the country's industrial sector. The reasoning here is that the Nigerian industrial sector is largely dependent on the import of machineries, spare parts and raw materials. This implies that the behaviour of the exchange rate has the potential to affect the output of the country's industrial sector. And this is all the more imperative in view of the fact that since the introduction of the Structural Adjustment Programme (SAP) in September 1986, the Nigerian currency, the Naira, has experienced persistent depreciation vis-a-vis the currencies of the country's major trading partners.

The theoretical position on the link between exchange rate behaviour and industrial sector output is that a depreciating currency inhibits the capacity to import needed producer goods, which are critical to the level of activities in the sector. In other words, a depreciation of the local currency in terms of the currencies of the country's trading partners serves to stifle the capacity to import intermediate goods and other raw materials that are needed to keep the industrial sector moving. To illustrate, suppose a unit of the Naira, the local currency, initially exchanges for $1. Suppose it exchanges thereafter for one US cent, a clear case of a depreciation of the local currency vis-à-vis the dollar, imports would tend to become more expensive in local currency terms. Thus, the relatively more expensive nature of imports that is consequent upon the depreciation of the local currency would tend to be less favourable to import demand and to the industrial sector. With regard to the various bouts of depreciation that the local currency has suffered, especially since the introduction of the SAP in 1986, and in the light of the foregoing analysis, it becomes appropriate to examine the impact of the depreciated nature of the country's exchange rate on the output of the nascent industrial sector of the Nigerian economy.

Interest Rate and Industrial Sector Output

The position of economic theory on the impact of interest rate behaviour on the output of the industrial sector is clear and unambiguous. In this connection, theory suggests that by serving as the cost of credit and thus a rationing device, a rise in interest rate, expectedly, should make borrowing prohibitive. This in turn, has the capacity to stifle the borrowing capacity of economic agents, including industrial sector players, to finance their activities.

The behaviour of interest rate in the Nigerian economy over the years has made it appropriate to examine empirically, its impact on industrial sector output. The introduction of the SAP in 1986, with all the sweeping deregulation that came in its wake, brought about a sharp upward swing in interest rate, which manufacturers and industrial sector players saw as inimical to their operations. Thus, the hue and cry over the persistent drop in capacity utilisation in the manufacturing and industrial sectors of the economy were largely attributed to the astronomic rise in the interest rate, and a weak and epileptic infrastructural base amongst others. Indeed, as the CBN (2005) noted in its Monetary, Credit, Foreign Trade and Exchange Rate Policy Guidelines for Fiscal 2004/2005, *over the years, the spread between banks' deposit and lending rates has remained unacceptably wide with adverse implications for savings mobilisation and investment promotion*. This largely explains why the concomitant decision by the Central Bank of Nigeria (CBN) to reduce the Minimum Rediscount Rate (MRR) was greeted with effusive encomium by manufacturing and industrial sector players in the country (see *BusinessDay*, March 03, 2005). Consequently, it is appropriate to ascertain empirically, the salutary impact or

otherwise of the behaviour of interest rate over the years on the output of the industrial sector in Nigeria.

Energy Availability and Industrial Sector Output

The critical role of energy in industrial sector production is widely acknowledged in the literature. Capital-intensive production processes, which typically characterise modern industrial production, rely on energy availability for smooth and efficient functioning. Energy is a critical input in production processes involving machines. In fact, energy is so critical in industrial production that in recent times, it is considered, although in a loose sense, a separate factor of production. Electricity is the main form of energy that is utilised by the industrial sector in Nigeria. Unfortunately, the electricity supply to consumers in Nigeria, including industrial sector consumers, has largely been characterised by inefficiency and waste that manifest in incessant power outages. As a result, there appears to be a discrepancy between the demand for electric energy by the industrial sector and the actual supply. Yet, energy supply gap is a critical factor that bears on the output of this sector in Nigeria. Indeed, it constitutes part of the totality of the infrastructural bottlenecks that has, for several years now, become the bane of manufacturing and industrial production activities in Nigeria.

Deficiencies in energy supplies force firms in the manufacturing and industrial sector to resort to private power provisioning, necessitating the installation of heavy duty generators and plants. The installation and the running costs incurred in the process serve to raise their cost of doing business in the country. And this, furthermore, serves to affect, adversely and severely, the level of activities in the sector. Indeed, the closure of several firms in the sector in recent times has, to a large extent, been blamed on the high and rising cost of doing business that many of the players in the sector have had to contend with. In the light of the foregoing, we deem it appropriate to ascertain the impact of gaps in energy supply to the industrial sector on the output of the sector. In this connection, it can be argued on a priori grounds that shortfalls in energy supply to the sector would impact adversely on the output of the sector, since marginal firms that are encumbered by inadequacy of needed energy input would fizzle out faster. Contrariwise, a positive gap in energy supply would serve as a boost to the level of activity in the sector, since firms in the sector would not be bogged down by energy supply bottlenecks. Accordingly, the impact of energy supply gaps on the sector's output is an issue to be resolved empirically.

The Level of Economic Activity and Industrial Sector Output

Empirical evidence showing the existence of a positive link between a country's level of income and long run growth abound in the literature. The works of Barro (1991), Romer (1990) and Lucas (1988) are worthy of note in this regard. The

clear and unambiguous role of income in engendering long-run growth implies that it can also be considered a causative factor in industrial sector growth and development. This, it does in a dual fashion. First, it constitutes a source of supply of funds for industrial expansion, given the Keynesian proposition that income not consumed is channeled into savings as funds for investment, [see Udegbunam (2004), Oaikhenan and Udegbunam (2001)] and second, a country's level of income bears critically on the demand for industrial output, given that a high and rising income level is a pointer to prosperous business conditions, which serves to generate greater demand for industrial output growth. It is appropriate, therefore, to ascertain the impact of the mind-boggling official statistics on the country's income growth rate on the country's industrial sector output. It is expected in this regard that income growth should impact in a significantly positive way on the output of the country's industrial sector.

Inflation and Industrial Sector Output

Inflation affects industrial sector output through its impact on prices of the sector's output. The theoretical proposition in this case is that a high and rising inflation rate should impact adversely on industrial growth by raising the prices of the output of the industrial sector, which becomes less competitive relative to imported goods. This has the capacity to engender a fall in the demand for the output of the sector. Falling demand levels would, in all likelihood, trigger off a decline in the level of activities in the sector. Clark (1993) and Barro (1991, 1996) for example, have come up with empirical evidence showing that inflation does indeed impact adversely on long- run output growth.

It is noteworthy that high and rising double-digit inflation rate, that is largely induced by fiscal irresponsibility on the part of the government, which is evidenced by the incessant cases of extra budgetary releases that has made deficit financing the norm in government's fiscal policy, has remained one of the major macro-economic concerns of the Nigerian governments in recent times [Anyanwu and Oaikhenan (1997)]. The salutary impact of inflation rate on the output of the industrial sector is worthy of empirical verification.

The Model

The model to be tested empirically can, in the light of the discussions in the preceding section, be specified in functional form and using the variables identified above as:

$$qind = f(oilprfl,\ xrdpr,\ \text{inf},\ gdp,\ \text{int},\ ensg) \tag{1}$$

The functional specification above is further specified in a form that is suitable for empirical testing as:

$$qind = \beta_0 + \beta_1 oilprfl + \beta_2 xrdpr + \beta_3 \text{inf} + \beta_4 gdp + \beta_5 \text{int} + \beta_e + ensg + u \tag{2}$$

Where:

qind	=	Industrial sector output, proxied by the index of industrial production
oilprfl	=	Oil price fluctuation
xrdpr	=	Exchange rate depreciation
inf	=	Inflation Rate
gdp	=	Gross domestic product, proxy for the country's level of income
int	=	Lending interest rate, proxied by the MRR
ensg	=	Energy supply gap, a measure of discrepancy between the quantum of energy supplied to the industrial sector and their demand.

U is a white noise error term assumed to satisfy the usual properties of zero mean, constant variance and zero covariance, incorporated in the specification to capture the non-deterministic nature of the model.

The presumptive signs of the parameters in the specification are:

$$\beta_1 >< 0;$$
$$\beta_2 < 0$$
$$\beta_3 < 0$$
$$\beta_4 > 0$$
$$\beta_5 < 0$$
$$\beta_6 >< 0$$

Data Definition and Sources

a. In the specification above, we capture oil price fluctuation (OILPRFL) by fitting observed data on OPEC basket of oil prices (OILPR) covering the 1970-2006 period to a trend variable. Thereafter, we obtained the deviation from trend as our measure of fluctuation in oil prices and used it in the regression exercise.

b. We used the exchange rate of the Naira to the dollar as a measure of exchange rate, since the dollar is the main currency for Nigeria's international economic transactions. In addition, the prices of crude oil in the international market are quoted in dollars. We, however, obtained changes in the exchange rate as our measure of exchange rate depreciation. Negative changes indicate an appreciation of the local currency in terms of the foreign currency while a positive change indicates a depreciation of the local currency relative to the foreign currency.

c. GDP and changes in GDP were used alternatively in the regression exercise, since it is expected that industrial sector output would respond not only to the country's level of income but also to the growth rate of the economy.

d. Energy supply gap was obtained as the difference between the one period lag of electricity energy supplied to the industrial sector and the one period lag of energy consumed in the sector, in view of lack of data on the sector's demand for energy in the current period. A positive difference implies excess of energy

supplied over that which was consumed. A negative difference translates to a shortfall in energy supplied relative to that consumed.

All the variables in the specification are measured in nominal terms since consistent series on the real magnitudes on some of them were not available. The data on the variables were obtained from several secondary sources, including various issues of 'OPEC Bulletin', various issues of 'CBN Annual Report and Statement of Accounts' and various issues of 'CBN Statistical Bulletin', IMF's 'International Financial Statistics' as well as various publications of the Department of Petroleum Resources, Lagos, and the publications of the National Bureau of Statistics, Abuja.

Estimation Techniques

The model represented by equation 2 above was estimated with the OLS estimation technique using the MFIT 4.1 computer software package (Pesaran and Pesaran, 1997). In estimating the model, we proceeded by first testing the unit root properties of the variables in the specification to ensure that they exhibit the same empirical characteristics and can therefore be useful for meaningful policy prescription. This is in the light of Engle and Granger's (1987) view that regression of two non-stationary series on each other possesses the potential of yielding spurious results, in view of the fact that estimates from such regression may be biased and inconsistent. In testing for unit root in the variables, we used the Augmented Dickey Fuller (ADF) test as proposed by Dickey and Fuller (1981). Thereafter, we utilised the variables in the estimation of the model. The results obtained are analysed in the next section.

Empirical Analysis

The results of the unit root test conducted, using the ADF test with intercept and trend, showed that all the variables except inflation failed the unit root test in their level form. Even then, the inflation rate variable weakly passed the test. It, however, passed the test very well in its first difference form. The results of the unit root test conducted are summarised in Table 1 below. In view of the fact that the variables passed the test in their first difference form, they were utilised in estimating the model in this form. The results obtained from the estimation of the model are reported in Table 2 below and analysed thereafter.

The results obtained are reported in Table 2 below. They were generally satisfactory when assessed in terms of signs and statistical significance. The major variable under focus, oilprfl, exhibited a negative sign, an indication that fluctuations in oil prices as measured impacted adversely on the output of the industrial sector within the period covered by this study. The sign exhibited by the co-efficient of this variable is instructive and has far-reaching implications for policy formulation

in Nigeria. The sign shows that instability in oil prices over the reference period did act as a drag on the output of the industrial sector. Thus, the empirical evidence suggests that fluctuations in oil export earnings, which were engendered by fluctuations in oil prices, were more detrimental than beneficial to the level of activities in the country's nascent industrial sector.

Table 1: Summary of Unit Root Test Result*

Variable	ADF statistic**	95% critical value	Variable***	ADF statistic	95% critical value
qind	-2.1786	-3.5426	dqind	-3.6508	-3.5468
oilprfl	-2.7338	-3.5426	doilprfl	-7.2434	-3.5468
xrdpr	-0.6520	-3.5426	dxrdpr	-4.1560	-3.5468
int	-2.2872	-3.5426	dint	-6.1861	-3.5468
gdp	-3.3806	-3.5426	dgdp	-8.3298	-3.5468
inf	-3.5621	-3.5426	dinf	-5.7396	-3.5468
ensg	-0.4853	-3.5426	densg	-3.8789	-3.5671

*   Data series used covered the 1970 - 2006 sample period.

**   The Dickey Fuller test includes an intercept and a linear trend

*** Variables are in their first difference form, denoted d. Thus, for example, dqind refers to the first difference form of the industrial sector output variable, qind etc.

Table 2: OLS Regression Result of Estimation of Industrial Sector Output on its Determining Variables

Dependent Variable: dindq

Regressor	Coefficient	t-statistics
Constant	-14.019	-1.7173
doilprfl	-0.0495	-1.9812
dxrdpr	-0.4376	-3.0829
dint	-0.3362	-1.8011
dgdp	0.2613	2.3474
dinf	0.6831	0.7312
densg	-0.4585	-3.0209

R^2=0.83; $\bar{R}_2$=0.79; SER=13.2; $F_{(6,25)}$=20.49; D.W=1.91; AIC=-20.519; SBC=-21.032

The foregoing finding indicates that instability in oil prices were more unfavourable to Nigeria than they were favourable. Indeed, an inspection of the figures on instability, as measured (as a deviation from trend) shows that there were more incidents of negative deviation than there were positive ones. The foregoing

notwithstanding, it is plausible to argue, however, that the negative impact of oil price fluctuation on the country's industrial sector may have been amplified by the palpable lack of transparency surrounding the management of the so-called "oil windfall" in Nigeria. The unpublished findings by the Okigbo Panel on the utilisation of the country's massive oil earnings that came in the wake of the first Gulf War of 1991 is worthy of note. Interestingly, this variable passed the significance test, although weakly at the 5 per cent significance level. It is thus a policy-relevant variable.

The empirical evidence also suggests that exchange rate depreciation impacted negatively and significantly on industrial sector output within the period covered by this study. Here again, the empirical evidence simply corroborates the theoretical position and the observed situation. As expected, a depreciating exchange rate should affect the level of activity in the industrial sector negatively, since it stifles the capacity to import intermediate input needed to keep the industrial sector moving. This finding is not surprising, given the observed persistent depreciation of the exchange rate of the Naira to the currencies of the country's major trading partners.

The foregoing findings must be understood against the background that the inception of the structural programme in 1986 and the wholesale adoption of market forces in the allocation of scarce foreign exchange and the determination of the country's exchange rate brought in its wake, persistent and unidirectional depreciation of the country's currency. And this had attendant adverse impact on the level of activities in the industrial sector in much the same way that it impacted on several other key macro-economic aggregates. Empirical evidence showing the adverse impact of exchange rate depreciation on the country's aggregate savings stands out in studies. [See, for example, Oaikhenan and Udegbunam (2001-2002)] The statistical significance of this variable again makes it a policy-relevant variable.

The finding with respect to the interest is also satisfactory in that it conforms to a priori expectation with respect to sign. The empirical evidence in this case shows that interest rate as expected, impacted negatively on the level of activities on the country's industrial sector within the period covered by this study. This conforms to a priori expectation, since a high and may be rising interest rate levels serve to raise the cost of credit, which in turn serves to choke the capacity of industrial sector participants in need of funds to borrow to finance their activities. Indeed, interest rates in Nigeria have maintained a persistently upward trend ever since the inception of the Structural Adjustment Programme in 1986, with a few isolated cases of decreases in its level. This is despite official interventions that have sought to dampen the high and rising level of interest rate faced by borrowers. Although the variable weakly passed the significant test at the 5 per cent level, it is nevertheless a policy-relevant variable.

The inflation rate variable exhibited a positive signed co-efficient estimate, contrary to expectation. It is expected that a high and probably rising inflation rate should impact adversely on the level of activity in the industrial sector since it would tend to raise the prices of output. This has the capacity to engender a decline in the demand for the output of the sector. The concomitant build-up of inventory of finished goods would, in all likelihood, trigger off a deceleration in the level of activity in the sector. The empirical evidence with respect to this variable may be explained, however, by the peculiar nature of the Nigerian situation. First, it is expected that the uncompetitive nature of the output of the country's industrial sector, that is a fallout of the prevailing inflationary situation, would make economic agents look elsewhere for alternative but more competitive sources of supply, usually the foreign sector. Yet, the attractiveness of this option is easily lost to the prohibitive nature of the depreciated exchange rate position. Thus, the explanation for the counter-intuitive finding may be that a high and rising inflation rate is actually a pointer to a deficient aggregate supply of goods and services to which industrial sector players respond by raising their level of output, with a view to filling the existing deficiencies that have triggered off the inflationary situation in the first place. And this explanation appears to corroborate the observed situation in the country. It is noteworthy, however, that this variable does not appear as a strong policy variable, given that it failed the significance test at all levels.

The empirical evidence with respect to the impact of economic growth on industrial output in Nigeria is satisfactory and in line with *a priori* expectation and the existing body of empirical evidence. Since a high and possibly rising income level and economic growth rate are pointers to prosperous business conditions, industrial sector players should respond to this prosperity in business climate by raising their level of output. Thus, increases in the level of industrial sector output may be seen as a contributory factor to the country's economic growth and a fallout of the country's economic growth. Indeed, available statistics show that the Nigerian economy has recorded substantial growth, fuelled mainly by the activities in the oil sector since the discovery and commercial exploitation of crude oil in Nigeria in 1958. A look at the country's GDP table reveals clearly and unambiguously that the country's economy is oil sector-led, since the contribution of the oil sector to GDP towers above all other sectors' contribution to the country's GDP. This variable interestingly passed the test of statistical significance very well at all levels of significance.

Finally, the finding with respect to energy supply gap variable exhibited a negative sign, suggesting that deficiencies in energy supply to the industrial sector impacted adversely on the output of the sector within the period covered by this study. Electrical energy constitutes the main form of energy that is consumed in the country. And electricity supply to consumers, including industrial sector , has, for several years now, been characterised by incessant power outages, necessitating

firms in the sector to seek alternatives to the Power Holding Company of Nigeria (PHCN), the public utility outfit that is saddled with the responsibility of electricity generation, transmission and distribution in the country.

Incessant power outages have been severely harmful to the economy by raising the cost of doing business for those few firms that are able to resort to private power provisioning. The majority of firms that are unable to cope with the harsh operating environment that is created by the lack of requisite supportive economic and social infrastructure have had to resort to the option of folding up. This scenario underscores the critical role of energy in driving industrialisation, economic growth and development. Indeed, as Iwayemi (1993) has pointed out, *modern civilisation would grind to a halt in the event of a sustained disruption to energy supplies*. Interestingly, this variable passed the significance test very well. The sign and the statistical significance of the variable have far-reaching implications for policy formulation relating to strategies to develop the industrial sector of the economy.

The summary statistics of the estimated model are satisfactory and they attest to the robustness of the specification. For example, we were able to explain up to 79% of the systematic variations in industrial sector output with the explanatory variables in the specification. This represents a good fit. The model, in addition, passed the test of overall significance as evidenced by the value of the computed F-statistic. Moreover, the Durbin Watson value of 1.91 is indicative of the absence of any serious problem of serial correlation in the specification.

Unit Root Test of Residuals and Test for Stability of the Estimated Model

The unit root test of the residuals was aimed at ascertaining the existence of co-integration among the variables in the specification. The robust value of the computed ADF test statistic (-4.402) (See Appendix 1) indicates that the variables in the specification are co-integrated. Accordingly, the empirical results can be used to make reliable predictions of the behaviour of the output of the industrial sector in the light of the explanatory variables in the specification.

To test the stability of the estimated model, we conducted the CUSUM and the CUSUMSQ tests by obtaining the plot of the residuals obtained from the regression exercise. The graphical plot of the CUSUM test is reported in Appendix 2b. As can be seen from this appendix, the model passed the stability test since the straight lines, representing the critical bounds at the 5% significance level, did not at any point cross the plot of the residuals. The result of the CUSUM test is further confirmed by the CUSUMSQ test, which is reported in Appendix 2a. Here again, the straight lines representing the 5 per cent significance level did not at any point cross the plot of the cumulative sum of squares of the recursive residuals. These are indications of the stability and robustness of the estimated models.

Policy Implications

The policy implications of the findings discussed above are fairly obvious. For example, the results suggest that fluctuations in crude oil prices have been more detrimental than beneficial to the industrial sector of the Nigerian economy. If this is indeed true, then it calls for policy actions that are aimed at maximising the benefits accruable from *favourable fluctuations* in oil prices while it lasts. Thus, policies designed to put in place *an oil earnings stabilisation fund* would be appropriate. Such fund could be utilised to cushion the effect of adverse and unfavourable movements in oil prices. The defunct Petroleum Trust Fund in Nigeria is an example in this regard. More important, is the need for policy makers to ensure prudence in the management of windfalls from oil earnings while they last.

The results also call for the need for policy makers to enact policies that are aimed at redressing the persistently dwindling fortunes of the exchange rate of the local currency, the Naira, to other currencies. This may entail boosting the supply side of the foreign exchange market as a way of shoring up the value of the Naira.

The results point in the direction of the need for policy makers to address the high lending rate in the economy as this is expected to be more helpful than hurtful to industrial sector output. Interestingly, the recent reduction in the Minimum Rediscounting Rate (MRR) in CBN monetary policy circular is a positive and commendable step in this regard.

In addition to the foregoing, there is the need for policy actions that are designed to stimulate the level of activity in the economy, since a robust level of economic activity has been found to impact positively and significantly on industrial sector output. Indeed, a healthy and robust economic growth rate will not only be beneficial to industrial sector output but will also be consistent with the goals and objectives of the Millennium Development Goals (MDGs).

The empirical finding with respect to the energy supply gap variable has far reaching implications for policy. Inadequacy in energy supply, the result shows, impacts adversely and significantly on industrial sector output in the country. Indeed, the results imply that there should be concerted effort on the part of policy makers to put in place measure that can ensure drastic reduction and indeed outright elimination of incidents of power outages, which is severely harmful not only to industrial sector development but also to the country's overall economic development. This requires a fundamental overhaul of energy policies in Nigeria and indeed, a complete turn-around of the existing power supply situation in the country. This makes the speedy implementation of the recently enacted Power Sector Reform Act in Nigeria an urgent imperative.

Summary and Recommendation

Our objective in this paper has been to ascertain the impact of the observed fluctuations that have characterised the behaviour of oil prices on the industrial sector of the Nigerian economy. Nigeria is a member of OPEC. The country's economy depends almost entirely on crude oil exports for, among other things, government revenue, foreign exchange earnings and GDP growth. Consequently, the behaviour of oil prices in the international market has far-reaching implications for the country's macro-economic aggregates. In addition, the push towards a market-driven economic system, which prompted the inception of the SAP in 1986, brought in its wake a prompt and steep depreciation in the value of the local currency, the Naira, vis-à-vis the currencies of the country's major trading partners. In this paper, we have sought to ascertain empirically the impact of oil price fluctuation, exchange rate depreciation and a battery of other control variables thought relevant to explaining the behaviour of industrial sector output..

The estimation of the model was done in two stages. First, we conducted unit root test for each of the variables in the specification. The results obtained showed that the variables were better used in their first difference form for the purpose of estimating the model. Next, we estimated the model using the OLS regression technique and with the MFIT4.1 computer software package. The results obtained were generally satisfactory. The empirical evidence obtained shows that fluctuations in oil prices have been more detrimental than beneficial to the country's industrial sector. In addition, the depreciated nature of the country's exchange rate has been more harmful than helpful to the country's industrial sector.

In addition to the foregoing, the results revealed that the country's economic growth has been beneficial to the output of the industrial sector. The finding with respect to the interest rate variable confirmed that high and perhaps, rising interest rate levels is harmful to the level of activity in the country's industrial sector. While the finding with respect to the inflation rate variable had little to recommend, those with respect to the energy supply gap variable indicated that inadequacy in energy supplies impacted in a significant way on the output of the sector within the period covered by this study. The unit root test of the residuals that were obtained from the regression exercise showed the existence of a co-integrating relationship among the variables in the specification. In addition, the model passed the CUSUM and CUSUMSQ tests of stability that were conducted using the residuals obtained from the regression exercise.

Conclusion

The findings in the study have far reaching implications for policymaking in the country. The issues thrown up by the empirical findings in the paper are

accordingly recommended to policy makers for a thoughtful and critical evaluation as a basis to guide policy formulation relating to the country's industrial sector.

In concluding the study, we note that the results obtained, being generally satisfactory may be considered a contribution to the existing body of empirical evidence on the impact of fluctuation in oil prices on the macro-economy, with industrial sector output as the key macro-economic aggregate that was the focus of this paper.

References

Anyanwu, J C and H E Oaikhenan (1997). Inflation in Nigeria: An Empirical Assessment of Determinants. *Prajnan Journal of Management and Social Sciences,* XXV (2): 117 -30.

Anyanwu, J C, S A Oyefusi, H Oaikhenan and F Dimowo (1997). *The Structure of the Nigerian Economy: 1960-1997*. Onitsha: Joanee Educational Publishers.

Barro, R J (1991). Economic Growth in a Cross-Section of Countries. *Quarterly Journal of Economics*, CVI (2): 407-43.

——— (1996). Inflation and Growth. *Federal Reserve Bank of St. Louis Review*, LXXVIII (3): 153-69.

Bohi, D R (1989). *Energy Price Stocks and Macroeconomic Performance*. Washington D.C.: Resources for the Future.

——— (1991). On The Macroeconomic Effects of Energy Price Stocks. *Resources and Energy*, XIII (2) 145- 62.

Brown, S and M K Yucel (1999). Oil Prices and US Aggregate Economic Activity: A Question of Neutrality. *Economic and Financial Review*, Second Quarter: 16-23.

——— (1995). Energy Prices and State Economic Performance. *Economic and Financial Review*, Second Quarter: 13-21.

——— (2004). Energy Prices and Aggregate Economic Activity: An Interpretative Study. *Research Working Paper 0102*. Federal Reserve Bank of Dallas.

Bruno, M R and J Sachs (1981). Supply versus Demand Approaches to the Problem of Stagflation. In Giersch H, F C Tubingen and B Mohr (eds), *Macroeconomic Policies for Growth and Stability*. World Bank. www-wds.worldbank.org/.../WDSP/IB/1999

Bruno, MR (1985). *Economics of Worldwide Stagflation*. Cambridge Mass: Harvard University Press.

Burbridge, J and A Harrison (1984). Testing for the Effects of Oil-Price Rises Using Vector Autoregression. *International Economic Review*, 25 (2): 459-84

Business Day (2005). *CBN reduces Minimum Rediscount Rate to 13%*. 4 (24): Thursday, March 03, 2005.

Central Bank of Nigeria (Various Issues). *Annual Report and Statement of Accounts*.

——— (Various Issues). *Statistical Bulletin*.

Clark T E (1993). Cross Country Evidence on Long Run Growth and Inflation. *Research Working Paper 93-05*. Kansas: Federal Reserve Bank.

Danielsen, A L (1982). *The Evolution of OPEC*. NY: Harcourt Brace Jovanovich.

Darby M R (1982). The Price of Oil and World Inflation and Recession. *American Economic Review*, LXXII (4): 738-51.

Dickey, D A and W A Fuller (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica*, XLIX (4): 1057-72.

Dornbusch, R and S Fischer (1990). *Macroeconomics*. Singapore; McGraw Hill Books 5th Edition.

Engle, R F and C W J Granger (1987). Cointegration and Error Correction: Representation, Estimation and Testing. *Econometrica*, LV (2): 251-76.

Federal Office of Statistics (Various Issues). *Annual Abstract of Statistics*.

Ferderer, J Peter (1996). Oil Price Volatility and the Macroeconomy: A Solution to the Asymmetry Puzzle, *Journal of Macroeconomics*, XVIII (1): 1-16.

Gisser, M and T H Goodwin (1986). Crude Oil and the Macoreconomy: Tests of Some Popular Notions. *Journal of Money, Credit and Banking*, XVIII (1): 95-103.

Hamilton, J D (1983). This is what Happened to The Oil Price-Macroeconomy Relationship. *Journal of Monetary Economics*, XXXVIII (2): 15-22.

——— (1999). *What is an Oil Shock?*. Xerox: University of California San Diego, November.

Hickman, B, H Huntington and J Sweeney (eds) (1987). *Macroeconomic Impacts of Energy Shocks*. Amsterdam: North Holland.

 IMF (Various Issues). *International Financial Statistics*.

Iwayemi, A (1993). Market Structure, Excess Capacity and Price Movements: Implications for the World Oil Market in the 1990s. *OPEC Review*, VI (3): 299-307.

Lucas, R E Jnr (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, XXII (1): 3-42.

Lukman, R (1995). Examining the Role of OPEC in the World Energy Industry. *OPEC Bulletin*, XXVI (4): 6-11.

Mork, K A and R E Hall (1980). Energy Prices, Inflation and Recession: 1974-1975. *The Energy Journal*, I (3): 31-63.

Mork, K A (1989). Oil and the Macroeconomy When Prices Go Up and Down: An Extension of Hamilton's Results. *Journal of Political Economy*, XCVII (2): 740-44

Mory, J (1993). Oil Prices and Economic Activity: Is the Relationship Symmetric?. *Energy Journal*, XIV(4): 151-61

Oaikhenan, H E (2000). An Econometric Analysis of OECD's Demand for and OPEC's supply of Crude Oil: A Disequilibrium Analysis. *PhD Dissertation*.

Department of Economics and Statistics, University of Benin, Benin City, Nigeria. (Unpublished)

——— (2004). Petroleum Resources: Development distribution and Marketing. In Bello Imam I B and M I Obadan (eds), *Democratic Governance and Development Management in Nigeria's Fourth Republic: 1999-2003*. Ibadan: Jodad Publishers.

——— and R I Udegbunam (2001). The Determinants of Savings Behaviour in Nigeria: An Empirical Investigation. *Prajnan: Journal of Management and Social Sciences*, XXIX (3): 211-28.

Obadan, M I (1986).The Impact of Export Instability on Nigeria's Economic Development: A Statistical Verification, *OPEC Review*, X (4): 409-25, Winter.

Pesaran, M H and B Pesaran (1997). *Working with Microfit 4.0: Interactive Econometric Analysis*. Cambridge England Comfit Data Ltd, Microfit 4.1 for Windows.

Pierce, J L and J J Enzler (1974). The Effects of External Inflationary Shocks. *Brookings Papers in Economic Activity*, I: 13-61.

Rasche, R H and J A Tatom (1977). The Effects of the New Energy Regime on Economic Capacity, Production and Prices. *Economic Review*, LIX (4): 2-12.

Romer, P M (1990). Endogenous Technological Change. *Journal of Political Economy*, XCVIII (5): 71-102.

Tatom, J A (1987). The Macroeconomic Effects of the Recent Fall in Oil Prices. *Economic Review of the Federal Reserve Bank of St. Louis*, LXIX (6): 34-45, June/July.

Yergin, D (1993). *Prize: The Epic Quest for Oil, Money and Power*. Free Press.

Appendix 1

Unit root tests for residuals

Based on OLS regression of DQIND on:

C	DOILPRFL	DXRDPR	DINT	DGDP
DINF	DENSG			

36 observations used for estimation from 1971 to 2006

	Test Statistic	LL	AIC	SBC	HQC
DF	-5.4989	-209.3221	-210.3221	-211.0853	-210.5824
ADF(1)	-4.4402	-209.0564	-211.0564	-212.5828	-211.5769

95% critical value for the Dickey-Fuller statistic = *NONE*

Critical value not available for the number of regressors in the regression

LL = Maximized log-likelihood   AIC = Akaike Information Criterion

SBC = Schwarz Bayesian CriterioN   HQC = Hannan-Quinn Criterion

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level
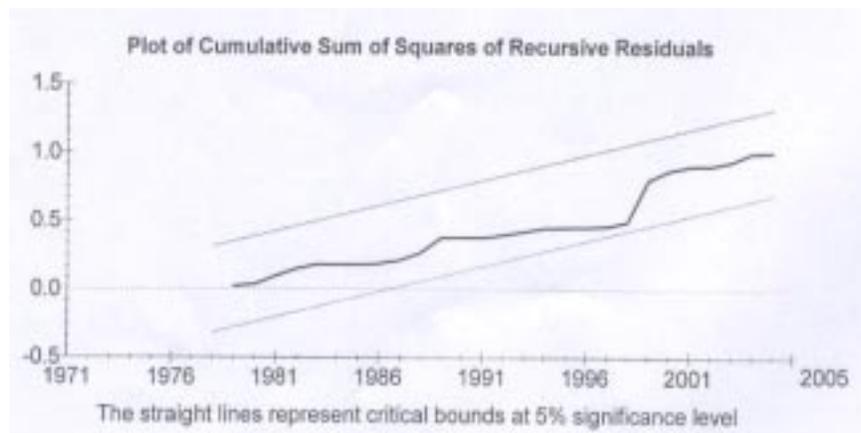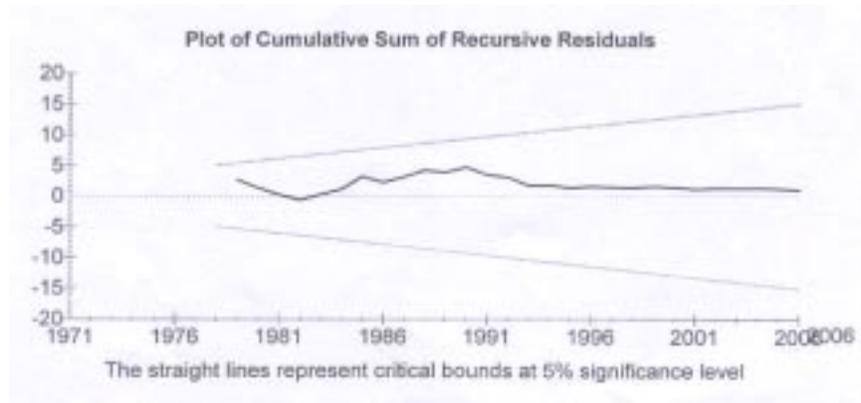
Resource Mobilisation and Utilisation by Panchayati Raj Institutions in UTs without Legislature

Jacob John and Ruchi Jain*

Abstract

Panchayati Raj Institutions (PRIs) in Union Territories (UTs) without a legislature have been grappling with many complex problems -- structural, administrative and fiscal. The Andaman and Nicobar Islands, Chandigarh, Daman and Diu, Dadra and Nagar Haveli and Lakshadweep Islands are the five UTs in India that do not have a legislature. This paper examines the essential features of the PRI system in these UTs, analyses the mobilisation and utilisation of funds by PRIs and suggests concrete measures to improve their functioning. The study reveals that though the administrative bodies of all the five UTs have specified that functions be transferred to PRIs, this is not being executed. In the absence of a legislature, the UT administrator and the bureaucracy have been holding powers. A huge amount of funds available with PRIs remain unspent every year primarily due to the lack of functions and functionaries. Significantly, the accumulated unspent balance with the PRIs has had an adverse effect on mobilisation of own source of revenue. Certain concrete steps that are essential to improve fund mobilisation and utilisation by the PRI system in the five UTs are suggested. Own source of revenue needs to be mobilised by strengthening tax assessment and collection process. The study highlights the urgency for the removal of the mismatch between activity mapping and corresponding funding of PRIs under various budget heads of UTs.

Introduction

Even after more than a decade of the passage of the 73rd and 74th Amendments to the Indian Constitution, Panchayati Raj Institutions (PRIs) are grappling with many complex problems - structural, administrative and fiscal. The problem is further confounded if one has to understand the functioning of panchayats in Union Territories (UTs) without a legislature. Andaman and Nicobar Islands (A&N Islands), Chandigarh, Daman and Diu, Dadra and Nagar Haveli and Lakshadweep Islands are the five UTs in India that do not have a legislature. In fact,

* Jacob John is Director, Kerala Development Society (KDS Delhi), New Delhi; Ruchi Jain is Research Associate, NCDEX Institute of Commodity Markets and Research, New Delhi.

it is the legislature that makes budgetary allocation to local bodies in most states. But in the absence of a legislature in UTs, policies are framed, approved and implemented through executive orders of the UT administration. The Union Home Ministry prepares the budget for the UTs which is passed for budgetary allocation from the consolidated fund of Government of India in Parliament. Once the budget is passed, the UT administrator can spend the fund. In fact, these UT administrators have more administrative freedom in the fund allocation compared to other states.

PRIs are local-level bodies that identify, formulate, implement and monitor development and welfare programmes. The states and UTs are required to pass necessary laws for the creation of PRIs and endow them with financial powers and responsibilities (NIRD 1996). Article 243-I of the Indian Constitution stipulates that a Finance Commission should be constituted for states and UTs to review the financial position of the panchayats and to make recommendations for transfer of financial resources to local bodies from the government of states/UTs. Transfer of financial resources to these local bodies take place in various forms - tax shares, grant-in-aid, tax assignments, etc. The resources of PRIs may be broadly classified under the following four heads:

a. Consolidated fund of the state as per the recommendations of the State Finance Commission
b. Central government funds through Centrally Sponsored Schemes
c. Grants-in-aid as per the Central Finance Commission
d. Own source of revenue

The Twelfth Finance Commission has also specified that the sources of income of PRIs in states and UTs should be within the parameters of *own tax revenue, own non-tax revenue, assignment plus devolution, grants-in-aid and others* (John, 2006). Within this framework, we need to look into the functions of PRI system in the five UTs focusing on revenue mobilisation and utilisation.

The objectives of this paper are to (i) examine the essential features of the PRI system in five UTs, (ii) analyse the mobilisation and utilisation of funds by PRIs, and (iii) suggest concrete measures to improve the functioning of PRI system in UTs.

PRI System in Union Territories

(a) Structure of PRIs

The Andaman and Nicobar Islands ranks high among the five UTs in terms of the size of territory and ranks second in population next only to Chandigarh. There have been wide differences among these five UTs with regard to physical features. But the variance of population is not very stark except Lakshadweep, which has a population of only 60,650. The PRI system in conformity with the 73rd

constitutional amendment came into existence in all five UTs during the same period. These systems, however, are not uniform in nature (Table 1).

On promulgation of the Andaman and Nicobar Islands (Panchayat) Regulation, 1994, a three-tier panchayat system was introduced for the UT. PRI system exists only in Andaman whereas Nicobar has a tribal council that does not come under PRIs. Andaman's PRI system has three tiers of panchayats: gram panchayat, panchayat samiti and zilla parishad. A total of 67 gram panchayats, seven panchayat samitis and one zilla parishad have been functional since October 1995. After the 73rd Amendment, panchayat regulations were amended in 1994 to provide for a two-tier panchayati raj system in Daman and Diu, which came into effect in 1995. Similarly, Dadra and Nagar Haveli Village Panchayat (Amendment) Regulation, 1994, provided for a two-tier panchayati raj system in Dadra and Nagar Haveli territory with effect from November 1995. It has one district panchayat at an apex level and 11 village panchayats at the base level.

Table 1: Profile of PRI system in UTs

Union Territory	PRI System	District Panchayat	Panchayat Samiti/s	Village Panchayats	Area (in sq km)	Total Population
Andaman & Nicobar Islands	Three-tier	1	7	67	8249	356152
Chandigarh	Three-tier	1	1	17	114	900635
Daman & Diu	Two-tier	1	-	14	112	158204
Dadra & Nagar Haveli	Two-tier	1	-	11	491	220490
Lakshadweep	Two-tier	1	-	10	32	60650

Source: UT administrations of Andaman & Nicobar Islands, Chandigarh, Daman & Diu, Dadra and Nagar Haveli and Lakshadweep

Following the promulgation of Lakshadweep Panchayats Regulation in 1994, the two-tier PRI system came into existence. The UT has one district panchayat at the top level and village (dweep) panchayats at the bottom level. In Chandigarh, the new PRI system came into existence in 1994 with the adoption of the Punjab Panchayati Raj Act, 1994. Accordingly, a three-tier Panchayati raj system was introduced in Chandigarh, which now has 17 gram panchayats, one panchayat samiti and one zilla parishad.

(b) Devolution of Power

Despite all the UTs having introduced PRI systems in conformity with the 73rd Constitution Amendment, we need to know more about the transfer of 3F's - funds, functions and functionaries to PRIs in real terms (Table 2).

Table 2: Devolution of Subjects

Union Territory	Transfer of subjects	Subjects covered under the activity mapping	Latest Position
Andaman and Nicobar	8	8	Activity mapping has been completed for eight subjects that include marine fisheries, poverty alleviation programmes, disaster management and rural electrification.
Chandigarh	-	-	Since Chandigarh is going to absorb its villages into the urban area, activity mapping has not been done.
Daman and Diu	18	18	Activities and schemes have been transferred to the Panchayats in respect of 18 subjects in 2001.
Dadra and Nagar Haveli	29	29	Activity mapping is made through amendments to the Dadra and Nagar Haveli Village Panchayat (Amendment) Regulation, 1994, notified in 2002.
Lakshadweep	25	25	Activity mapping has been completed and notified after the pressure from Ministry of Panchayati Raj and notified in end 2006.

Source: Ministry of Panchayati Raj, The State of the Panchayat, Vol-I, November 2006

The Andaman and Nicobar Islands Panchayat Regulation, 1994, has specified that the powers of all the three tiers of PRIs in relation to matters listed in various schedules, including activities in sanitation, health, education, agriculture, animal husbandry, social welfare, minor irrigation, cooperation, women welfare, village industries, relief etc. The most worrisome feature of the functioning of the PRI system is that the UT administration has transferred only eight subjects out of 29. It should also be noted that even for these subjects, which include agriculture, fisheries, water supply, road development and electricity, powers have not been fully transferred. The devolution of powers to PRIs in Andaman and Nicobar Islands has several other worrisome features. For instance, the funds and functionaries required for proper upkeep and maintenance of the transferred assets are yet to be provided to PRIs.

Daman and Diu has devolved 18 subjects to PRIs, though restricted to certain activities. Village panchayats have been given jurisdiction over subjects like sanitation and public health, public works, planning and development, social welfare and education, and culture, while district panchayat has jurisdiction over non-conventional energy, poverty alleviation, welfare of the weaker sections and maintenance of community assets. Besides this partial transfer, adequate numbers of functionaries have not been provided to perform the various functions entrusted. This comes in the way of implementing tasks and projects. It also needs to be mentioned that most of the staff working for the panchayats are on deputation as they hold charge and draw salary from the parent department. This staff is not really accountable to panchayats.

Dadra and Nagar Haveli has transferred all the 29 subjects, but partially. For example, agriculture, animal husbandry, dairy and poultry, rural electrification, education including primary and secondary schools, health and sanitation, family welfare and women and child development are the subjects that have been partially transferred. In order to carry out the above functions, functionaries consisting of technical and non-technical staff are transferred to the panchayat on a deputation basis. The staff is not accountable to PRIs as they continue to draw salary from and report to their parent department.

It was only after the Ministry of Panchayati Raj exerted some pressure that the UT of Lakshadweep notified the transfer of 25 subjects to PRIs in 2006. However, as of early 2007, the actual transfer was yet to take place. It has been found that four UTs have devolved few subjects and activities to PRIs while there has been no devolution of funds, functions or functionaries to PRIs in Chandigarh. It seems that PRIs will cease to exist in this UT. Activity mapping, which is the key level issue, has also not been done.

The foregoing analysis reveals that though the UT administrations of all the five UTs have specified that functions be transferred to the PRIs, the orders of the administration are not being executed in its true letter and spirit. We need to bear in mind that the constant power struggle between PRIs and UT administrators is mainly due to the resistance from the bureaucracy. In the absence of a legislature, UT administrators and the bureaucracy have been holding powers.

(c) Institutional Framework

Elections: Article 243-E of the Constitution of India stipulates that regular election to all the tiers of PRIs should be conducted. However, some of the states have not yet conducted regular elections. However, it is interesting to note that almost all the tiers of PRIs in five UTs have conducted regular elections (Table 3).

Table 3: Elections to PRIs in UTs

Union Territory	Gram Panchayat	Panchayat Samiti	District Panchayat
Andaman & Nicobar	1995	1995	1995
	2000	2000	2000
	2005	2005	2005
Chandigarh	2002	2001	2005
Daman & Diu	1995		1995
	2000	NA	2000
	2005		2005
Dadra & Nagar Haveli	1995		1995
	2000	NA	2000
	2005		2005
Lakshadweep	1997	NA	1997
	2002		2002

Note: NA=Not Applicable

Source: UT administrations of A&N Islands, Chandigarh, Daman & Diu, Dadra and Nagar Haveli and Lakshadweep

(d) Auditing System

All the five UTs have provisions in the respective Panchayat Raj Acts with respect to the maintenance of accounts by panchayats and the auditing of such accounts as stipulated by Article 243-J of the Indian Constitution. However, in all the five UTs, except Andaman and Nicobar Islands, regular audit is not taking place. The Examiner of Local Fund, who is the prescribed authority, conducts the audit of accounts of the panchayats at all the three levels in the UT. However, local fund audits are not being done regularly. There has been an attempt to conduct a Comptroller and Auditor-General audit into the accounts of zilla panchayat though it has not yet materialised. Similarly, in the UTs of Daman and Diu, Dadra and Nagar Haveli and Lakshadweep, there is no regular audit. However, in Andaman and Nicobar Islands, the local fund audit department of the UT administration has been conducting the audit of panchayati raj bodies of all the three tiers regularly every year.

(e) Gram Sabha

In Andaman and Nicobar Islands, gram sabhas are essentially held twice a year. It is a statutory requirement for all the projects to be approved in the gram sabha. These approved projects are to be taken up by gram panchayat, panchayat samiti or zilla parishad, according to the size of the project. Generally, gram panchayat takes up smaller projects while bigger projects are executed either by panchayat

samiti or zilla parishad. The public is informed of the gram sabha to be held via radio, newspapers, notice boards, wallpapers and public announcement system. Expenditure for convening gram sabha is met from the untied funds.

In Dadra and Nagar Haveli and Daman and Diu, gram sabhas perform their vital role of selecting beneficiaries, approving plans and programmes and issuing the utilisation certificates. The beneficiaries of different schemes of the poverty alleviation programmes are identified by the gram sabha. The gram sabha covers the entire village, and one-tenth of the total number of members forms the quorum. It considers various aspects of projects for the current financial year, identifies beneficiaries for development programmes and recommends proposals for taxation. The gram sabha meetings are usually held two to four times in a year. But these are generally sparsely attended as the people would be preoccupied with their own work.

In Chandigarh, meetings of the gram sabha are held twice a year i.e. one in the month of December after the harvesting of Sawni crop and the other in the month of June after the harvesting of Hari crop on such dates as fixed by the Sarpanch. Issues discussed in the gram sabhas relate to water and sanitation, ration cards, old age certificates, BPL cards and other day-to-day issues concerning the village. In Lakshadweep, despite the provision in the UT's regulation, gram sabhas are not operational except in Kalpeni (dweep) panchayat. Entire village (dweep) panchayat is covered by a gram sabha.

(f) District Planning Committee

In accordance with Article 243 of the Constitution, all the states and UTs are required to set up District Planning Committees (DPCs) to consolidate the plans prepared by the panchayats and municipalities into the draft development plan for the district. All the UTs, except Chandigarh, have set up DPCs. Among these five UTs, the DPC in Andaman and Nicobar Islands has a greater role in the planning process. However, in all the UTs as final approval of the plan is required from the UT administration, the freedom of DPCs is limited. Moreover, being constituted partly through indirect election and the remaining by nomination, the DPC is neither accountable to the people directly nor to the local government institutions.

(g) State Finance Commission

Two finance commissions have been constituted for the UTs to make recommendations on the determination of taxes, duties, tolls and fees which may be assigned to or appropriated by the panchayats, the grants-in-aid to the panchayats, the measures needed to improve the financial position of the panchayats, and on any other matter referred to the Commission by the administrator in the interest of sound finance of panchayats.

The Finance Commission constituted under Section 186 of the Andaman and Nicobar Islands (Panchayat) Regulation, 1994, for the Andamans is also the Finance Commission for the Union Territory of Lakshadweep, Daman and Diu and Dadra and Nagar Haveli. The State Finance Commission for NCT of Delhi is also functioning as Finance Commission for UT, Chandigarh. These Finance Commissions, after making thorough studies on the prevailing conditions in the UTs , have submitted two reports to the respective administrators recommending various strategies to improve the over all financial positions of the PRIs.

Resource Mobilisation and Utilisation

PRIs in UTs receive funds mainly from government as grant-in-aid and through centrally sponsored schemes. These funds are primarily used for executing various development projects. Major projects undertaken by the three tiers of PRIs include construction of bridges, auditorium, mini stadium, anganwaries, community hall, markets, shopping complex, bus shelter, CC drain, retaining wall, footpaths and school buildings at various places. PRIs give thrust on installation of rural water supply, rural sanitation, village roads, lighting, footpath, culvert, rural education and minor irrigation.

(i) Andaman and Nicobar Islands

Grant-in-aid and Centrally sponsored schemes are the main source of funds for PRIs in Andaman and Nicobar Islands. Own source of revenue forms an insignificant part of the total funds of PRIs in the UT. The administration releases grant-in-aid for general and sectoral schemes and matching grants to the PRIs from time to time. Table 4 displays total fund received and utilized by all the three tiers of PRIs in the UT during 2001-04. The opening balance available to PRIs witnessed a consistent increase while the percentage of unspent balance to the total fund available at each tier remained quite high.

The pattern of revenue and expenditure of panchayats in Andaman & Nicobar Islands reveals that it handles a huge amount of fund. During 2003-04, panchayats received Rs 49 crore, out of which gram panchayats received 45 per cent, panchayat samiti 21 per cent and zilla parishad 34 per cent. A total of Rs 40.18 crores was available with zilla parishad during 2001-02, out of which only Rs 2.42 crores was spent. However, the huge balance was carried forward for the next year. In 2002-03, it spent Rs11.55 crore, which was 50 per cent of the funds released. During 2003-04, the expenditure went up to Rs17.06 crore showing an improvement in the utilisation of funds.

During 2001-02, the expenditure incurred for honorarium by zilla parishad was more than the funds released whereas only 5.7 percent of the funds released for rural roads were utilized. In the same year, minimal importance was given to the

setting up of the educational institutions, and the funds released under PMGY, PMGSY and rural water sector remained unspent. The expenditure on roads, water supply and education increased during 2002-03 as compared to previous year. Moreover, in the next year the total expenditure was greater than the funds released. So, over the years, the zilla parishad has shown improvement in funds utilisation.

Panchayat samitis in Andaman and Nicobar Islands have utilised only 20-25 per cent of the total funds available with them during 2001-04 leaving a huge unspent balance every year. During this period, panchayat samitis spent a large proportion of the total expenditure on roads.

Table 4: Receipt and Expenditure of Panchayats
Andaman & Nicobar Islands   *(in Rs Lakh)*

Year	Opening Balance	Receipt	Total	Expenditure
Zilla Parishad				
2001-02	510	3508	4018	242
2002-03	3776	2317	6093	1155
2003-04	4938	1675	6613	1706
Panchayat Samitis				
2001-02	299	1245	1544	332
2002-03	1212	1417	2629	558
2003-04	2072	1015	3087	764
Gram Panchayats				
2001-02	939	1474	2413	722
2002-03	1691	2443	4134	1058
2003-04	3029	2213	5242	1316

Source: Pay and Account Department, Zilla Parishad, Port Blair

The data on receipts and expenditure incurred by the gram panchayats reveal that unspent balance is quite high in all the three years as in the case of the other two tiers. The results of field survey show that the major activities of gram panchayats are road construction and water supply. In fact, this is clearly depicted in the expenditure pattern of gram panchayat as well.

It is interesting to note that the percentage of funds utilisation by panchayat samitis and gram panchayats has not shown much improvement over the years whereas the zilla parishad reveals that its fund utilisation has improved over the years. As there is separate engineering wing for zilla parishad, it has not been facing the problem of delay in getting technical approval for the projects. Moreover, they have better trained and technically qualified staff with a well-established office compared to panchayat samitis and gram panchayats.

Unspent balance as a % of Total Funds Available*

■ 2001-02 ■ 2002-03 □ 2003-04

Zilla Parishad: 94.0, 81.0, 74.2
Panchayat Samitis: 78.5, 78.8, 75.2
Gram Panchayats: 70.1, 74.4, 74.9

Percent (y-axis: 0 to 100)
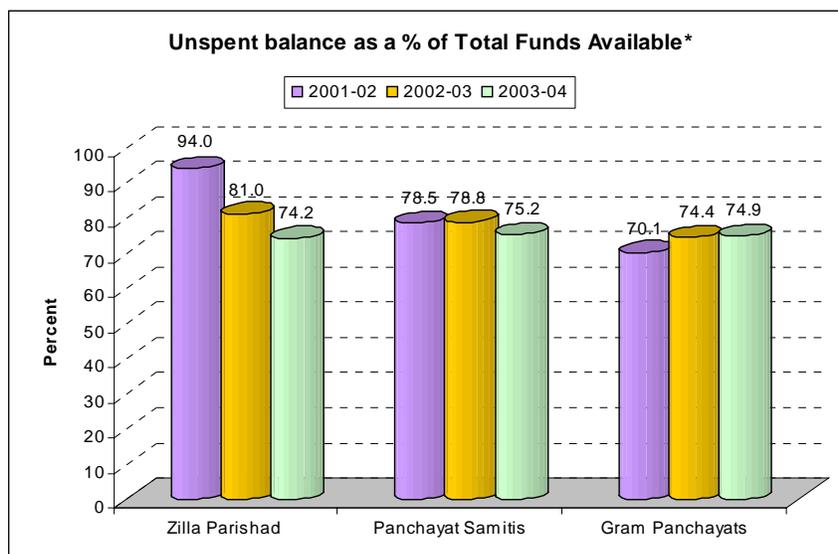
* Total Funds Available=Opening balance + Receipts

Based on the detailed discussions with elected representatives and officials of PRIs, it has been found that several problems have led to this situation. First, there has been an undue delay in getting administrative and technical approvals for the projects. The delay in receiving technical sanction is mainly due to the shortage of technical staff. Shortage in trained staff in non-technical sectors of PRIs is also a major constraint. Secondly, the elected representatives of PRIs have not yet been provided adequate training and orientation. Even though the gram sabha has the authority to approve the work, adequate expertise in the preparation of the plan is a major constraint in planning and execution of projects. Another serious problem is the climate condition in Andaman and Nicobar Islands. Due to incessant rain for almost eight months, construction can be undertaken for only four months. Also, the committee system, mainly work committee, estimate committee and finance committee is not functional in almost all the panchayats. It is significant to note that the accumulated unspent balance with PRIs has had an adverse effect on mobilisation of own source of revenue.

(ii) Chandigarh

The Punjab Panchayati Raj Act of 1994 defines the sources of funds for the three tiers of panchayat. The zilla parishad receives grant-in-aid from the UT administration and also plan and non-plan grants. Zilla parishad does not receive any scheme-wise funds. The receipt and expenditure of Chandigarh zilla parishad show that since 2000-01, the opening balances have been increasing (Table 5). This

is obvious, as the receipts have been increasing but the functions of the zilla parishad are very limited. Over the years, there has been a continuous increase in its plan and non-plan income. Though the total expenditure of the zilla parishad has increased from 2001 to 2005, the amount spent with respect to the funds available has been dismally low. In 2000-01, just 21 per cent of the funds were utilised while it was merely 30.2 per cent and 41.2 per cent in 2002-03 and 2004-05 respectively.

Table 5: Receipts and Expenditure -Zilla Parishad, Chandigarh *(In Rs Lakh)*

Year	Opening Balance	Receipts		Total	Expenditure	Closing Balance
		Plan	Non-Plan			
2000-01	27.1	2.0	2.4	31.5	6.6	24.9
2001-02	24.9	11.0	47.2	83.1	5.3	77.8
2002-03	77.8	50.8	20.1	148.8	45.0	103.8
2003-04	103.8	76.3	51.7	231.8	94.4	137.4
2004-05	137.4	99.0	58.0	294.4	121.3	173.1

Source: Zilla Parishad, Chandigarh

As the zilla parishad of Chandigarh is not active, most of the major projects and activities are shared between the panchayat samiti and gram panchayat. The activities of the panchayat samiti are mainly in the areas of infrastructure building, health and sanitation, sports and cultural programme and training of the PRI members.

Though the resources of the panchayat samiti run in crores every year, huge amount is is left as as unspent balances, primarily due to the lack of functions and the functionaries. It is imperative to note that there is no fixed ratio of funds received by the three tiers of panchayat in Chandigarh. However, the funds received by the zilla parishad are released to the panchayat samiti and the gram panchayats according to their respective requirements. The allocation of funds by the zilla parishad to the panchayat samiti and the gram panchayat can be broadly classified in three components. First is the grant-in-aid to the panchayat samiti for various projects and activities such as infrastructure building, training of the PRI members and other developmental works. The second component of the funds is given to the gram panchayat. The third component of the fund remains with the zilla parishad for some miscellaneous activities. According to the elected representatives and officials, there are no untied grants. Though the elected representatives revealed that the budget is discussed in detail at panchayat meetings, 30 per cent of them are unaware of the allocated budget of the respective panchayat. About 75 per cent of the officials of PRIs covered in the field study in Chandigarh disclosed that there is no vertical distribution of finances among the three tiers of panchayats.

There is also a component of own source revenue mobilised by the panchayats themselves. The own source revenue of the villages in the UT during 2004-05 is shown in Table-6.

Table 6: Own Source of Revenue, Chandigarh (2004-05)

Village	Amount (Rs)	Village	Amount (Rs)
Hallo Majra	15345	Dadumajra	102758
Behlana	529000	Dhanas	121076
Raipur Khurd	7200	Maloya	1877953
Raipur Kalan	28345	Palsora	99850
Daria	98873	Kajheri	138896
Mauli Jagran	29400	Khuda Ali Sher	44664
Kishangarh	31015	Kambwala	40936
Sarangpur	23625	Khuda Jassu	28147
Lahora	137777		

Source: Zilla Parishad, Chandigarh

Note: (1) Large variations can be seen in the revenues of different villages as some of them are receiving tax revenues from the industrial units

(2) The given data are the actual collection realised and the data on demand assessment are not available

Though gram panchayats are entitled to levy taxes, such as taxes on land and buildings, professions, trade, entertainment and stamp duty (barring house tax), they are not levied. Even the collection of house tax is quite irregular. The panchayat samiti can also levy certain fees and taxes that include toll on vehicles using roads or bridges, fee on the registration of the vehicles, water tax and electricity tax. However, taxes at the level of panchayat samiti are not yet levied.

(iii) Daman and Diu

The revenue and expenditure pattern of district panchayat shows that there has been a consistent increase during the three-year period from 2001-04 (Table 7). While revenue has increased from Rs 9.29 crore in 2001-02 to Rs12.74 crore in 2003-04, expenditure has gone up from Rs 24.88 lakh to Rs 2.27 crore during the same period. However, it needs to be noted that a significant amount was left unspent in 2003-04.

In 2001-02, only 20 per cent of the funds received by the district panchayat for roads and bridges was utilised, whereas grants-in-aid received under the two Centrally-sponsored programmes -- PMGSY and PMGY -- for roads and bridges were not spent at all. Moreover, the funds allotted for general education, public health, minor irrigation, crop husbandry and animal husbandry remained unutilised.

Over the next two years, a large proportion of total expenditure was spent on roads and bridges. For water supply and sanitation, the expenditure incurred was 10 per cent of the funds received during 2002-04.

Table 7: Receipts and Expenditure - District Panchayat
Daman & Diu *(In Rs Lakh)*

Year	Opening Balance	Receipts		Total	Expenditure	Closing Balance
		Plan	**Non-Plan**			
2001-02	141.8	766.9	20.5	929.2	24.8	904.4
2002-03	904.3	180.0	22.0	1106.3	199.5	906.8
2003-04	906.7	347.5	19.5	1273.7	226.8	1046.9

Source: District Panchayat, Daman & Diu

The village panchayats in the UT spend funds mainly on public works, sanitation and public health, social welfare and education. The expenditure incurred on administration forms a significant proportion of the total expenditure by the village panchayat. For example, in 2004-05 Vanakbara and Bhucharwada village panchayat spent Rs 5.64 lakh and Rs 3.64 lakh respectively for administrative purposes. Also, the village panchayats in Daman & Diu collect revenue from house tax, professional tax, advertisement tax, license fees, market fees, etc. They spend its funds on construction and maintenance of village roads, drainage and culverts, and drinking water schemes. The responsibility of the maintenance of street lighting remains with them.

iv) Dadra and Nagar Haveli

District panchayat has no source of income of its own, except the fund allocated by the UT administration in the form of plan and non-plan allocation including the grants-in-aid. It is granted ten lakh rupees per annum, as an untied fund. It should be noted that district panchayat does not have the taxation powers.

Table 8: Receipts and Expenditure - District Panchayat
Dadra & Nagar Haveli *(in Rs Lakh)*

Year	Opening Balance	Receipt	Total	Expenditure	Closing Balance
2003-2004	-	211	211	104.84	106.16
2004-2005	106.16	115	221.16	112.61	108.55
Total		**326**	**432.16**	**217.45**	**214.71**

Source: District Panchayat, Dadra & Nagar Haveli

During 2003-2005, a total of Rs 326 lakh was received by the district panchayat against an expenditure of Rs 217.45 lakh (Table 8). There was an unspent balance of Rs 108.55 lakh. Expenditure of PRIs has been essentially on provision of services and administrative expenses like staff salary, office maintenance and stationery, among others. Services include expenses on repairs and maintenance of streetlights and water supply schemes.

Village panchayats in this UT have their own source of income through house tax, professional tax, market fee etc. They have been found to rely mainly upon house tax and profession tax. However, tax assessment is not undertaken regularly. In addition to this, each panchayat receives grant-in-aid from the government to the tune of Rs 3 lakh annually. They receive tied grants to be used for specific purposes. Land revenue grant is a regular form of annual receipt for the village panchayats and the entire land revenue collected from villages under the jurisdiction of a village panchayat is returned to the respective panchayat by way of this grant.

The relatively disadvantaged village panchayats tend to spend a larger share of their resources on administrative items and those with a stronger resource base on upkeep and maintenance of civic amenities. Repair and maintenance of streetlights appears to be the single largest item of expenditure. Since some of the major requirements even in the sphere of drinking water, roads and street lighting are shouldered by the UT administration, the village panchayats have only to look after the occasional repairs and maintenance. The village panchayat of Silvassa has quite a few assets and, therefore, maintenance and administration of these assets is a major item of expenditure for this panchayat. The source of funds for the panchayat in the UT includes grants-in- aid and Centrally-sponsored programme (Table 9).

Table 9: Funds with panchayats (2004-05)
Dadra & Nagar Haveli   *(in Rs Lakh)*

Grant-In-Aid (GIA)	Other than GIA	Sarva Shiksha Abhiyan	Receipts of Panchayats	Funds under CSS	Total
1181.5	1056.00	887.00	507.49	692.30	4324.29

Source: UT administration, DNH. (GIA was increased Rs 1520 lakh later)

v) Lakshadweep

For the years 2002-03 and 2003-04, the budget estimate of the district panchayat was Rs 12.72 crore and Rs 13.81 crore respectively. The district panchayat receives Rs 20 lakh as untied grant from the UT administration for the development schemes. The Lakshadweep administration provides Rs 5 lakh each to the village

panchayat as untied fund for development projects. Section 51 of the Lakshadweep Panchayats Regulation, 1994 empowers the panchayats to levy taxes and fees on the items indicated therein. Based on the recommendations of the Finance Commission for UT, a Joint Committee under the chairmanship of the President-cum-Chief Counsellor, DP, was constituted to recommend a proper taxation proposal to the panchayats. The panchayats have not yet started collection of most these taxes and fees.

As the untied grant of Rs 5 lakh to each village panchayat per annum to formulate schemes on the subjects under their jurisdiction is very limited, it has been facing severe financial crunch. Moreover, the taxation system of the local government is not in place. This has compelled each village panchayat to develop small projects that are suitable to local conditions to generate funds. Some examples of such project are jaggery and vinegar making, pickle making, sale of vegetables, broiler chicken and plastic bags, rental of furniture and other items for marriages, etc.

Revenue Collected by Village (Dweep) Panchayats, Lakshadweep upto the year 2003-04
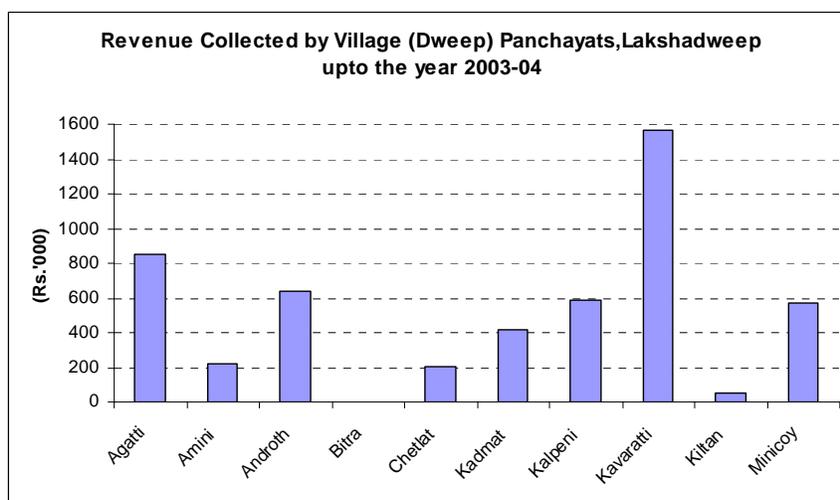
The income and expenditure pattern of Kavaratti village panchayat shows that it spent Rs 44.98 lakh and Rs 36.92 lakh during 2003-04 and 2004-05 respectively (Table 10). It should be noted that a major share of this amount is spent by the various departments which are transferred to PRIs. These include agriculture, medical services and social justice empowerment and culture. In fact, as these departments are functioning almost independently, village panchayat does not have much role in the fund utilisation.

Table 10: Receipts and Expenditure - Kavratti Village (Dweep) Panchayat
Lakshadweep   *(in Rs Lakh)*

Particulars	2003-04		2004-05	
	Receipts	**Exp.**	**Receipts**	**Exp.**
Director of Panchayat	9.24	12.17	20.72	19.85
Agriculture	18.73	17.37	17.39	1.93
Medical Health & Services	4.70	5.0	5.98	5.30
Animal Husbandry	2.78	3.68	3.31	2.99
District Employment Exchange	2.32	1.22	1.58	1.34
President LCCW	0.1	0.08	0.07	0.07
Social Justice Empowerment & Culture	2.05	1.17	2.37	1.66
Public Works Department	1.45	1.84	1.05	1.18
Dy. Conservator of forest	2.45	2.45	2.40	2.60
Total	**43.82**	**44.98**	**54.87**	**36.92**

Source: Kavaratti Village (Dweep) Panchayat, Lakshadweep

Recommendations

PRIs in all the five UTs confront several common problems. Among them devolution of powers and shortage of technical staff are major areas of concern. A huge amount of funds remains unspent every year primarily due to the lack of functions and functionaries. It is significant to note that the accumulated unspent balance with PRIs has had an adverse affect on mobilisation of own source of revenue. Certain concrete steps that are essential to strengthen the PRI system in the five UTs and improve its fund utilisation are listed below:

- As there is a mismatch between activity mapping and corresponding funding in various budget heads of UTs, it is important to give funds to the local government institutions through budgetary allocations according to the activity mapping.
- Own source of revenue needs to be mobilised by strengthening tax assessment and collection process. There is good scope for mobilising own source of revenue though assessing and collecting professional and property taxes. In order to streamline the system, district panchayat can assess professional and property taxes whereas village panchayats can collect them.
- Various Finance Commissions for UTs have made several recommendations for mobilisation of own source revenue by local government institutions. For instance, the Second Finance Commission for the UTs of Andaman and Nicobar Islands, Dadra and Nagar Haveli, Daman and Diu and

Lakshadweep has recommended that the local government should learn to take hard and unpopular decisions so as to become fiscally health. The commission has recommended various ways to raise own source of revenue through tax and non-tax sources. It is of the view that the statutorily provided spectrum of local taxation is quite wide and local governments can pick and choose depending on their local circumstances. Also, by bringing more services under user charges, fees and fines can widen the range of non-tax sources. However, the recommendations of Finance Commissions for UTs have not been seriously implemented. It is equally important to point out that those recommendations have not attracted public debate or scrutiny. So it is suggested that recommendations of Finance Commissions for UTs should be implemented.

- The mandatory approval of development plan by gram sabha should be introduced in all the five UTs. However, it will be more effective if expertise and training can be given for the identification and preparation of development plans. All UTs should provide sanctioning authority to gram sabhas, not only in terms of powers for identifying and selecting persons as beneficiaries under the different programmes but also the power to issue certificate of funds utilisation.

- Committee system should be made functional at all the three-tiers of panchayat. There is an urgent need to introduce three committees: work committee, estimate committee and finance committee to accelerate the execution of development projects.

- Proper programme should be introduced to create awareness about the significance of gram sabha among the public. Proper guidance and orientation is to be given to them in acquiring knowledge and necessary skills in planning and implementation of various development programmes and schemes by PRI.

- Regular training and capacity building should be organised for PRIs to equip them in the execution of the projects. As officials including those from the line department or transferred institutions are not under the control of the panchayat, it is quite appropriate to have a separate panchayat cadre staff in line with the increase degree of financial autonomy. Adequate engineering staff should be employed at each level of PRIs. As introduced in Karnataka, permission should be given to PRIs to outsource engineering staff from universities, etc.

- As tax potentials are limited in UTs, like Lakshadweep, innovative projects need to be introduced by the panchayats to generate own source of revenue.

References

National Institute of Rural Development (1996). Local Government Finances in India, Proceedings of National Conference on Emerging Trends in Indian Local Government Finances, NIRD, Hyderabad, 24-25 October, 1996.

John, Jacob (2006), *The Role of Panchayati Raj Institutions in Execution and Implementation of plan projects in Union Territories without legislature*. Institute of Social Sciences, New Delhi at http://planningcommission.nic.in/ reports/sereport/sereporf.htm.

Ministry of Panchayati Raj, Government of India (2006). *The State of the Panchayat, Vol-I*. New Delhi. November.

Growth of Rural Non-Agricultural Employment and Poverty Alleviation in India: What Does Emerging Evidence Indicate?

R R Biradar*

Abstract

The growth of rural non-agricultural employment (RNAE) has occupied an important place in the development paradigm of many poverty-stricken countries as it leads to greater poverty reduction as well as, in most cases, income-equalising effects. In India, the rural economy has witnessed occupational diversification in favour of the rural non-agricultural sector over the years. It was largely driven by the growth as well as poverty-related factors. The growth of RNAE, followed by agricultural growth and human resource development, turned out to be the major reason for poverty reduction in rural areas. An important observation is that a shift of workers away from agriculture to the rural non-agricultural sector tends to raise the wage rates of the existing labourers in agricultural sector, thereby contributing to a decline in poverty. Occupational diversification in favor of RNAE, therefore, has dual impact, direct and indirect, on the reduction of poverty. In view of a gradual decline in the share of the public expenditure for rural developmental programmes, including poverty alleviation, the promotion of RNAE largely driven by agricultural growth and human resource development which can be considered as an important policy intervention to tackle the long-standing problem of poverty in rural India.

Introduction

An analysis of rural employment structure in India, *prima facie*, reveals that there has been a moderate shift of workers away from agriculture to non-agriculture since the 1970s. As a result of increasing population pressure, declining land frontiers, deteriorating employment elasticity in agriculture, urban organised manufacturing sector and excess supply of labour, a large segment of workers,

especially the ones with more educational qualifications, are taking up jobs in the rural non-agricultural sector. Such occupational diversification has poverty-reduction and income-equalising effects as the daily earnings and income levels are not only higher but also rising at a faster rate in rural non-agricultural occupations than in the agricultural sector in recent years[1]. The growth of rural non-agricultural employment (RNAE)[2] is, therefore, regarded as one of the robust policy instruments to tackle the long-standing problem of poverty and income inequality in rural areas of many developing countries in Asia, Africa and Latin America.

The empirical studies on a few countries of Asia and Africa reveal that there has been an inverse relationship between the size of landholdings and income from the non-agricultural sector. For a large number of marginal and small farmers, the rural non-agricultural sector is the major source of household income (Samuel 1979; Liedholm and Kilby 1989). Similarly, a large number of studies in Latin America and the Caribbean (LAC) also show that the poor households derive their major share of income from RNAE, contributing to a decline in the incidence of poverty (Ferreira and Lanjouw 2001; Ruben and Van den Berg 2001; Reardon Berdegue and Escobar 2001). In the Indian context too, several studies at the aggregate level (Vaidyanathan 1986; Chadha 2001; Chadha and Sahu 2002; Dev 1990; Unni 1991; Bhalla 1993; Visaria 1995; Parthasarathy, Shameem and Reddy 1998; Biradar 2006), drawing data from the National Sample Survey Organisation (NSSO) and the Population Census, have mainly focused on examining the growth structure and determinants of RNAE at different levels. A few studies based on primary data, however, reveal that, like in other developing countries of Asia, Africa and Latin America, the income levels of the poor households involved in RNAE have gone up significantly and contributed to a decline in the incidence of rural poverty (Unni 1996, Rajasekhar and Biradar 1998, Lanjouw and Shariff 2004). The development strategy focusing on the growth of RNAE is, therefore, gaining importance in many developing countries of the world.

---

[1] The daily real wage rates in the rural non-agricultural sector have been on the rise since the mid-1970s. The non-agricultural wage rates are also much higher than those of agriculture (Bhalla 1993, Unni 1997, Sharma 2001, GoI 2003). An increase in the proportion of workers in RNAE, *a priori,* is expected to increase the income levels of the rural non-agricultural labour households and to that extent it contributes to a decline in the incidence of rural poverty.

[2] RNAE includes all the non-agricultural activities such as mining and quarrying; manufacturing activities of cottage, small-scale rural industries; public utilities; construction; trade and hotel business; transport, storage and communication; services; and the seasonal and contractual non-agricultural activities available within villages or nearby towns (Rajasekhar and Biradar 1998).

A study of regional pattern of RNAE as well as the incidence of rural poverty in the pre-reform (1983) and post-reform (1999-00) periods will certainly help the policy makers and development practitioners in deciding the type of policy intervention needed to tackle the problems of unemployment and poverty in the countryside. Against this background, an attempt, therefore, has been made to examine the growth of RNAE and the prevalence of poverty incidence at the all-India level and across major states, to identify important sources of poverty reduction and suggest policy prescriptions for sustained and faster decline of poverty in rural areas.

Database and Limitations

The study is based on secondary data collected from various quinquennial surveys, published by NSSO, on employment-unemployment situation in India. The data on male and female workers, as per usual status (US)[3] - principal and subsidiary status - in RNAE for sixteen major states were collected for the quinquennial periods between 1972-73 and 1999-2000. Since the year 1987-88 was a drought year in many parts of the country, a temporal comparability of the NSS data might not show the consistent trends and patterns of changes in male and female RNAE during the pre-and post-reform periods. The periodisation from 1983 to 1987-88 as the pre-reform and 1993-94 to 1999-2000 as the post-reform is, hence, made at the risk of some reliability.

The data on proportion of people living below the poverty line, as estimated by the Planning Commission, the Government of India, were also presented for the same sixteen major states during the same period. While describing the changes in regional pattern of RNAE and poverty, the data for 1983 were used to reflect the situation that prevailed during the pre-reform period and the data for 1999-2000 were used to reflect the situation that prevailed during the post-reform period.

Rural Non-Agricultural Employment in India

Growth, Size and Composition

The growth of employment was quite high in the rural non-agricultural occupations than in agricultural sector during the period 1972-73 to 1977-78, and 1993-94 to 1999-2000 (Parthasarathy, Shameem and Reddy 1998; Biradar and Bagalkoti

---

[3] The principal status activity of a person is defined as the activity status on which a person spends relatively longer time of the preceding 365 days from the date of survey is considered as the principal usual status activity of the person. A person categorised as a non-worker who pursued some economic activity in a subsidiary capacity is considered as subsidiary status worker. These two groups, namely, principal status and subsidiary status workers, together constitute usual status workers.

2004; Biradar 2006). In fact, the growth rate of employment in agriculture was negative in the 1990s. This implies that a larger share of workforce shifted to RNAE, particularly during the post-reform period, albeit at a decreasing rate over time.

The data presented in Table 1 reveal that the annual growth rate of workers in rural non-agriculture was higher in the pre-reform as compared to the post-reform years.

Table 1: Growth Rates of Workers (UP+SS) in RNAE, GDP and Food grains in India, 1972-73 to 1999-2000 (per cent/per annum)

Particular	1972-73 to 1977-78	1977-78 to 1983	1983 to 1987-88	1987-88 to 1993-94	1993-94 to 1999-00	1972-73 to 1999-00
Growth Rate of NAWs			**Rural**			
Persons	5.07	4.23	4.48	1.93	2.05	3.30
Males	5.03	4.58	4.28	2.54	2.33	3.52
Females	5.19	3.19	5.09	0.36	1.04	2.61
			Rural & Urban			
Persons	4.74	4.05	3.68	3.32	1.97	3.35
Males	4.39	4.24	3.50	3.61	2.04	3.37
Females	6.10	3.31	4.37	2.18	1.70	3.28
Growth Rate of GDP*	4.53	3.13	4.76	5.31	6.60	4.81
Agriculture	3.91	1.75	1.70	4.02	3.13	3.03
Manufacturing	5.13	3.41	5.91	5.50	6.92	5.63
Services	5.01	4.80	6.89	6.29	8.84	6.08
Growth Rate of Food grains	4.26	0.92	0.73	3.30	2.03	2.62

Note: * The calculation is based on the data (at 1993-94 prices) as supplied by Central Statistical Organisation 2003, New Delhi; NAWs: Non-agricultural workers.

Source: NSSO (1981, 1988, 1990, 1997 & 2001); GoI (2003a).

Going by gender, the growth of RNAE was quite higher for males than for females. The occupational diversification in favour of rural non-agricultural sector by females is much slower. This shows that the annual growth of employment in the rural non-agricultural sector slowed down in the 1990s, especially in respect to female workers. Similar observation was also made by other studies (Chadha 2001, Chadha and Sahu 2002, Biradar 2006). The data further reveal an interesting trend that the growth of non-agricultural employment, especially in the rural areas, have fluctuated in accordance with the growth rates of agricultural income (at 1993-94 prices) and food grains. The data also show that whenever the growth of agricultural income and food grains were found to be higher, the growth rates of workers in

RNAE, especially in respect to female workers, were also recorded to be lower. The growth rates of workers, particularly female workers, in the rural non-agricultural sector tend to move in opposite direction to the growth rates of agricultural income and food grains (Figure 1).

Figure 1: Nexus between the Growth of Agriculture and Non-Agriculture in India
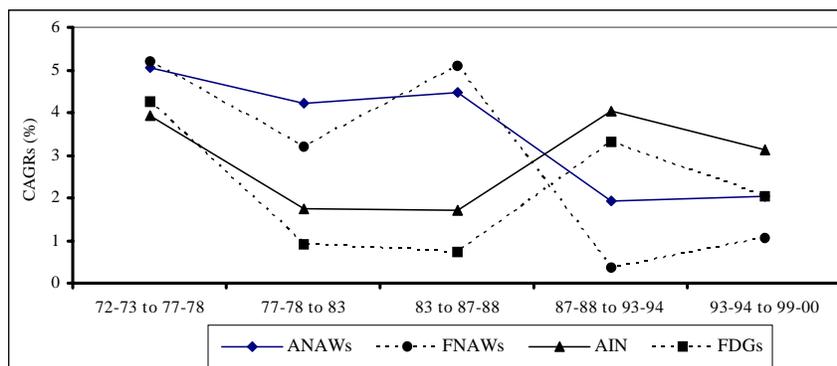
Note: ANAWs: All non-agricultural workers; FNAWs: Female non-agricultural workers; AIN: Agricultural income; FDGs: Food grains; CAGR: Compound annual growth rate.

Source: Table 1.

The sectoral diversification of rural economy in terms of employment in agriculture is not proportionate to its corresponding changes in national output. While there has been a constant decline in the proportion of agriculture in the national output during the last five decades or so, there was no decline in the share of employment till 1970. Since the 1970s, the proportion of workers started to show a sustained decline in agriculture and a corresponding rise in the rural non-agriculture sector. At the all-India level, while the proportion of workforce in agriculture declined from 74 per cent in 1972-73 to 60 per cent in 1999-2000 (NSSO 1981, 2001), the proportion of income from agriculture consistently declined from about two-thirds to a little over one-fourth of the national income during the same period (GoI 2003a). The changes in the production structure have not matched the changes in the occupational structure (Bhalla 1997; Parthasarathy, Shameem and Reddy 1998; Bhatt 2003).

A considerable decline in the share of agriculture in the national income and marginal decline in the proportion of workers in the farm sector has created a greater scope for the growth of RNAE. The data presented in Table 2 reveal that, at the all-India level, the proportion of workers in RNAE has been on the rise, constantly. It increased from 26.11 per cent in 1972-73 to 40.03 per cent in 1999-2000.

Going by the gender, while the proportion of male workers in the non-agricultural occupations, by and large, witnessed a constant increase, a virtual stagnation was discernible in respect to females in the early 1990s and which picked up in the late 1990s.

Table 2: Proportion of Workers (UP+SS) in RNAE in India,
1972-73 to 1999-2000

Year	Rural			Urban			All India		
	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons
1972-73	16.68	10.35	14.42	89.31	67.12	85.17	31.21	15.68	26.11
1977-78	19.34	11.76	16.59	89.35	67.96	84.84	34.43	18.18	28.98
1983	22.11	12.15	18.42	89.70	68.03	85.20	37.83	18.79	31.37
1987-88	25.38	15.16	21.69	90.93	70.00	86.55	41.31	22.34	35.06
1993-94	25.89	13.56	21.49	91.39	75.29	88.13	43.40	22.41	36.65
1999-2000	28.79	14.71	23.94	93.43	82.51	91.28	46.76	25.02	40.03

Source: 1) NSSO (1981, 1988, 1990, 1997 & 2001).

This pattern of changes observed at the all-India level varies across rural and urban areas. In rural areas, a rapid increase took place in the share of male non-agricultural workers, whereas in respect to females, it increased rather slowly during 1972-73 to 1999-2000, except for 1987-88. In 1987-88, the country experienced a severe drought due to which the employment opportunities sharply declined in agriculture (Parthasarathy, Shameem and Reddy 1998). As a result, the rural workers seem to have been compelled to take up jobs in the rural non-agricultural sector available within the village or nearby towns. If we drop the year 1987-88, a rapid increase in respect to male and moderate increase in respect to female RNAE took place in rural areas during 1972-73 to 1999-2000 (Figure 2). It has also been found that the share of both male and female workers in the urban non-agricultural sector/ informal sector, by and large, increased constantly; a greater increase took place in the 1990s, especially in respect to female workers. Further, the share of female workers in the urban non-agricultural sector increased much faster than in rural non-agriculture sector in the 1990s as compared to the 1980s. In urban areas, they have not been affected much due to the drought in 1987-88. It is evident that the size of non-agricultural sector, particularly for males in rural areas and females in urban areas, has been on the constant rise during the entire period; the increase was a little faster in the pre-reform than in the post-reform regime.

There has been a widening gap between male and female participation in RNAE over the years (Figure 2), implying that female workers are not equally participating in RNAE, and their accessibility is, to a greater extent, constrained by several socio-economic factors prevailing in rural areas. All in all, the size of the

rural non-agricultural sector has been expanding with varying degrees across gender and areas, but the rate at which it increased in the 1980s has not sustained in the 1990s.

Figure 2: Size and Composition of Workers in RNAE in India, 1972-73 to 1999-2000
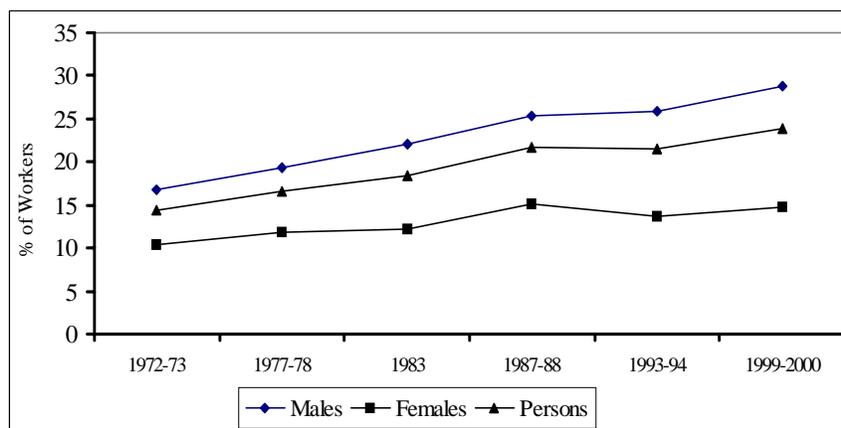
Source: Table 2.

Regional Pattern of RNAE

The above analysis clearly reveals that there has been a moderate growth of RNAE in varying degrees across male and female workers in rural and urban areas. The growth of RNAE, however, is not uniform across different states in the country. A considerable regional variation in the share of workers in RNAE is quite perceptible.

The data presented in Table 3 reveal that most of the states have had a higher proportion of workers in RNAE than that of the all-India rural averages, among which Kerala, followed by Himachal Pradesh and Haryana, recorded the highest share in RNAE. A rapid increase in the proportion of male workers in RNAE took place in most of the states in the 1980s as compared to the 1990s. A majority of the states witnessed a steep decline in the proportion of male RNAE in 1993-94 over 1987-88 and picked up in 1999-2000. The drought of 1987-88 seems to have disturbed the natural growth of RNAE in majority of the states, especially in Rajasthan, Gujarat and Orissa (Parthasarathy, Shameem and Reddy 1998). The values of co-efficient of variation also reveals that the regional disparity started to show a sharp decline in the pre-reform period, and began to rise in the post-reform period.

Table 3: Distribution of Male and Female Workers (UP+SS) in RNAE by Major States in India, 1972-73 to 1999-2000 (Per cent)

State	Males						Females					
	72-73	77-78	1983	87-88	93-94	99-00	72-73	77-78	1983	87-88	93-94	99-00
Andhra Pradesh	21.4	19.7	25.6	25.9	24.4	25.6	13.8	14.6	18.7	17.9	16.3	15.7
Assam	-	-	-	23.5	21.8	35.3	-	-	-	17.7	16.8	20.6
Bihar	17.8	16.9	18.7	20.0	18.0	21.0	14.8	11.0	11.8	9.8	8.1	14.3
Gujarat	16.1	15.6	21.1	31.4	28.9	28.6	8.7	5.6	7.7	24.2	9.4	8.0
Haryana	19.9	22.5	27.8	29.1	39.1	40.4	15.6	9.5	9.7	7.5	6.8	7.9
Himachal Pradesh	18.9	22.6	22.9	31.3	34.2	46.2	1.6	1.8	2.4	3.6	4.5	4.9
Karnataka	14.8	16.8	18.4	20.4	21.2	21.5	10.9	12.5	11.8	14.5	15.4	12.2
Kerala	44.3	40.8	42.2	45.8	46.8	57.2	41.4	27.4	29.1	34.3	37.0	40.2
Madhya Pradesh	9.9	10.8	12.8	14.7	12.8	15.8	4.4	5.3	6.1	8.9	6.4	8.4
Maharashtra	17.6	19.6	20.4	24.2	24.7	26.2	6.6	7.8	7.1	8.6	8.8	6.1
Orissa	18.4	15.4	21.8	25.1	21.3	23.0	18.3	14.2	19.0	22.0	15.0	19.6
Punjab	20.6	22.2	22.5	31.2	31.9	36.3	37.0	10.0	7.4	8.4	7.3	9.4
Rajasthan	15.6	17.5	19.0	34.8	30.4	32.7	8.4	4.7	6.1	16.7	7.0	8.1
Tamil Nadu	24.6	26.1	31.1	34.8	36.0	37.8	15.6	16.4	18.2	22.9	21.5	24.1
Uttar Pradesh	18.1	19.8	21.3	21.1	23.7	28.2	15.0	10.9	10.3	8.7	10.0	12.5
West Bengal	22.1	22.3	26.9	27.8	35.3	33.6	43.1	31.3	24.9	29.2	41.1	45.9
All India	19.3	19.5	22.4	25.5	25.9	28.6	14.3	11.9	12.3	15.3	13.8	14.6
CV (%)	37.8	32.9	29.0	27.0	31.2	34.2	76.7	66.2	60.2	57.2	77.5	77.6

Note: CV: Co-efficient of variation. CV is estimated for the data on proportion of male workers in RNAE for fifteen major states.

Source: 1) NSSO (1981, 1988, 1990, 1997 & 2001).

An analysis of the regional pattern of male and female RNAE across the states ranked with the agricultural prosperity, the rate of literacy and the incidence of unemployment, brings out interesting policy insights to understand the dynamics of RNAE. The percentage distribution of male workers in RNAE by the states, ranked in ascending order of per capita income from agriculture (PCIA)[4] as a proxy

---

[4]   The per capita income from agriculture (cultivators and agricultural labourers) is estimated for 1983 to examine the regional variation in RNAE due to the variation in agricultural growth. In most cases, the states of abnormal variations in RNAE are not included for graphical presentation.

for agricultural prosperity, reveals that most of the states with higher PCIA had a major share of male workers in RNAE as compared to the states with lower PCIA, except Tamil Nadu and Bihar (Figure 3). Further, in most of the agriculturally developed states *vis-à-vis* backward states, a greater increase took place in the proportion of male workers in RNAE in 1999-2000 over 1983[5]. This follows that the growth of agriculture has contributed to an increase in the level of male participation in RNAE, mostly through consumption and production linkages during the post-reform period.

At the same time, the states with lower PCIA also, in part, seemed to have experienced a moderate increase in the share of male workers in RNAE, indicating that the distress in agriculture also contributed to the growth of male RNAE. The distress movements of male workers into the rural non-agricultural sector in times of agricultural distress could not be, in toto, ruled out (Jayaraj 1994; Parthasarathy, Shameem and Reddy 1998; Rajasekhar and Biradar 1998; Biradar 2006, 2007).

Figure 3: Percentage Distribution of Male Workers in RNAE by Major States Ranked in Ascending Order of PCIA, 1983 and 1999-2000
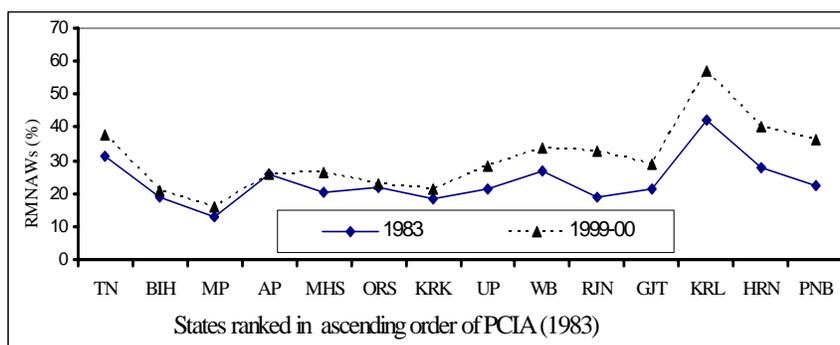
Note: RMNAWs: Rural male non-agricultural workers.
Source: Table 3.

It has also been found that the distribution of male workers in RNAE, by the states ranked in ascending order of the rate of male literacy (RML)[6] in 1983 and 1999-2000, clearly shows that the states with higher RML had considerable proportion of male workers in RNAE as compared to the states with lower RML

---

5   A greater increase in the proportion male RNAE during 1983 to 1999-2000 can be seen in terms of the level of distance between the 1983 and 1999-2000 lines, which tended to rise along with the states with higher PCIA.

6   The states were ranked in ascending order of the rate of male literacy in 1981, as per the census data, to explore the nexus between male education and male RNAE in the pre-(1983) and post-reform (1999-2000) years.

(Figure 4). A greater increase in the proportion of male RNAE was registered in the states with higher RML than in lower ones in 1999-2000 over 1983. This clearly indicates that the rate of literacy, as a surrogate to human capital, was also one of the key factors determining the extent of male participation in RNAE during the post-reform period.

Figure 4: Percentage Distribution of Male Workers in RNAE by Major States Ranked in Ascending Order of RML, 1983 and 1999-2000
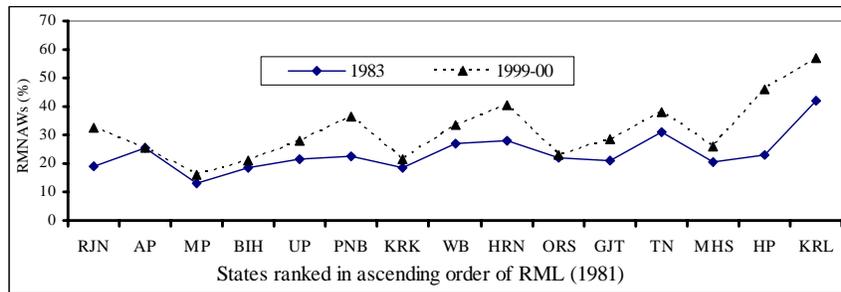
Note: RMNAWs: Rural male non-agricultural workers.
Source: Table 3.

Figure 5: Percentage Distribution of Male Workers in RNAE by Major States Ranked in Ascending Order of CDS UR, 1983 and 1999-2000
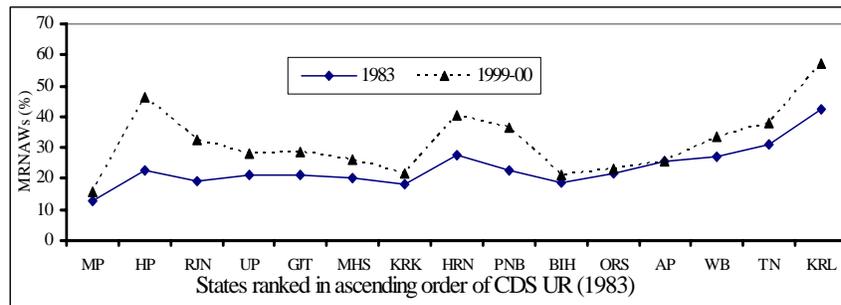
Note: RMNAWs: Rural male non-agricultural workers; CDS UR: Current daily status unemployment rates.
Source: Table 3.

The percentage distribution of male workers in RNAE by the states, ranked in ascending order of the current daily status unemployment rate (CDSUR)[7], also indicates that the states with higher incidence of unemployment had larger share of

---

[7]   To capture the distress-induced RNAE during the pre- and post-reform periods, the states were ranked on the basis of the incidence of unemployment as per CDS in 1983.

male workers in RNAE. This follows that the distress factors, in part, also contributed to the growth of male RNAE. The data, however, shows that a greater increase took place in the proportion of male workers in RNAE in those states that had lower ranks of CDSUR as compared to states that had higher ones in 1999-2000 over 1983. This follows that the growth of male RNAE in the states with lower CDSUR seemed to have been determined by growth related factors.

In respect to females, the data (Table 3) indicate that the share of female *vis-à-vis* male workers in RNAE is quite lower in most of the states, except for West Bengal. The proportion of RNAE increased continuously only in two states, viz., Kerala and Himachal Pradesh, during 1972-73 to 1999-2000. If we drop the year 1987-88, most of the states seem to have witnessed a moderate rise in the share of females in RNAE. It has also been found that the co-efficient of variation in female RNAE is much higher than that of male RNAE. The values of co-efficient of variation declined in the years of pre-reform period, whereas it began to rise in the years of post-reform period; the pace of increase was much higher than the pace of decline. A distributional pattern of female workers in RNAE by the states ranked in ascending of PCIA, in most cases, suggests that, unlike in the case of male workers, the states with higher PCIA had lower proportion of female workers in RNAE *vis-à-vis* the states with lower PCIA (Figure 6). An increase in the proportion of female workers in RNAE appeared to have recorded in the states which had lower PCIA than the states with higher ones in 1999-2000 over 1983. This illustrates the fact that a rise in income from agriculture tended to prevent the female workers from participating in RNAE unless they were highly paid. It can generally be observed that women were treated as respectable life partners but not active work partners (Chadha 2001). Only in times of distress in agriculture, a section of female labourers, mostly belonging to the resource poor households, would be forced to work in agriculture or outside so as to stabilise their annual household income and the living standard.

Figure 6: Percentage Distribution of Female Workers in RNAE by Major States Ranked in Ascending Order of PCIA, 1983 and 1999-2000
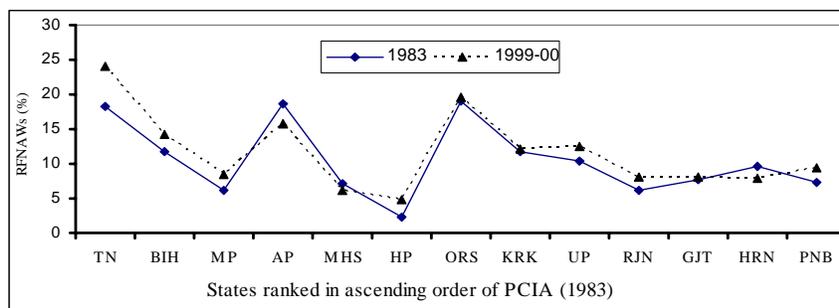
Note: RFNAWs: Rural female non-agricultural workers.
Source: Table 3.

In the absence of agricultural growth, the distress diversification of female workers in favour of rural non-agricultural activities was quite discernible (Jayaraj 1994; Parthasarathy, Shameem and Reddy 1998; Rajasekhar and Biradar 1998; Biradar 2006, 2007). As in the case of male workers, the percentage distribution of female workers in RNAE by the states ranked in ascending order of the rate of female literacy (RFL), reveals that the states with higher RFL had higher proportion of female workers participating in RNAE (Figure 7). It has also been found that, in most cases, the states with higher RFL experienced greater rise in the proportion of female workers in RNAE as compared to the states with lower RFL in 1999-2000 over 1983. This shows that the activities generated in the rural non-agricultural sector are more likely to be skill and knowledge based. That is why a large segment of workers in the age-groups of 15-19 and 20-24 years have begun to withdraw from the labour market in favour of schools/colleges to acquire more educational qualifications, skills and knowledge (Chadha 2001, 2004; Biradar and Bagalkoti 2001; Chadha and Sahu 2002; Biradar 2004).

Figure 7: Percentage Distribution of Female Workers in RNAE by Major States Ranked in Ascending Order of RFL, 1983 and 1999-2000
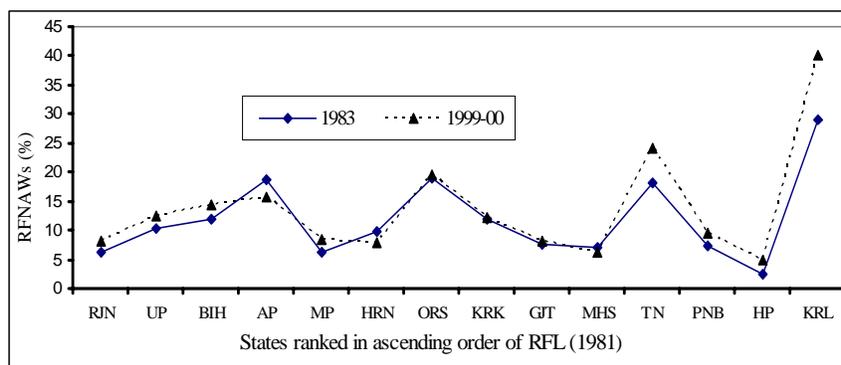
Note: FRNAWs: Female rural non-agricultural workers; RFL: Rate of female literacy.
Source: Table 3.

The distress diversification of female RNAE is explicitly evident from the percentage distribution of female workers in RNAE by the states ranked in ascending order of the female CDSUR (Figure 8). The states with higher incidence of female CDSUR *vis-à-vis* the states with lower ones showed a significant share of females in RNAE in the years 1983 and 1999-2000. This shows that there has been a distress diversification of female RNAE. A rapid increase in the proportion of female workers in RNAE also took place in those states with higher incidence of female unemployment as compared to the states with lower ones during 1983 to 1999-2000.

The foregoing regional pattern of analysis clearly reveals that the regional variation in the proportion of male RNAE was better explained by growth related factors, whereas in the case of females, it was largely explained by distress-related factors (Rajasekhar and Biradar 1998; Birdar 2006, 2007).

Figure 8: Percentage Distribution of Female Workers in RNAE by Major States Ranked in Ascending Order of Female CDSUR, 1983 and 1999-2000
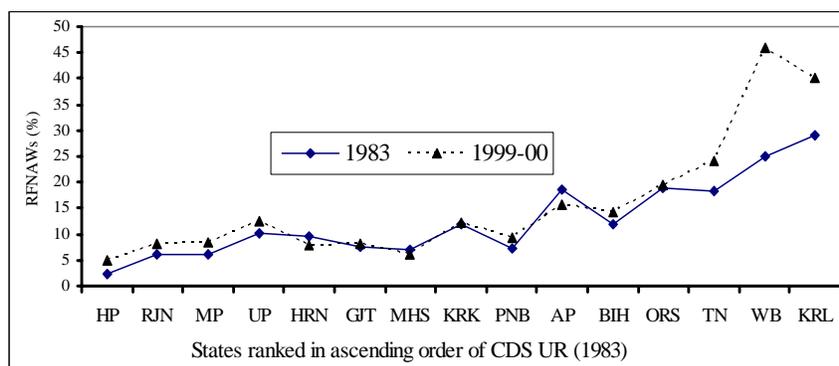
Note: RFNAWs: Rural female non-agricultural workers: CDS UR: Current daily status unemployment rates.
Source: Table 3.

Prevalence of Poverty in Rural India

In India, especially in rural areas, the incidence of poverty continues to be widespread and persistent (WB 1997, 2000; Dev 2000; Sundaram 2001; Sundaram and Tendulkar 2003). Although the economic growth-enhancing strategy based on "trickle-down hypothesis", and multi-pronged and multi-faceted poverty alleviation programmes were launched, India still has the world's largest number of poor, estimated at 260.2 million, 75 per cent of them in rural areas as per the Planning Commission figures for 1999-2000. The persistence of poverty has received a greater attention of researchers, policy makers and development practitioners in view of our endeavour towards achieving one of the Millennium Development Goals, as set by the UN General Assembly in 2000, of halving the incidence of poverty by 2015 (WB 2001). A multi-dimensional poverty alleviation approach, therefore, has to be worked out in the context of changing macro-economic scenario.

Given the controversy over the extent of poverty reduction in the recent past, the proportion of people living below the poverty line certainly declined in 1999-2000 over 1993-94. The data presented in Table 4, *prima facie*, show that the incidence of poverty has been largely concentrated in rural rather than urban areas; three out of every four poor persons live in rural areas. In rural areas, however, the

percentage of people living in poverty, by and large, declined constantly from 56.4 per cent in 1973-74 to 27.1 per cent in 1999-2000, whereas in the case of urban areas, it declined from 49 per cent to 23.6 per cent during the same period. The decline in the incidence of poverty is little faster in rural areas than in urban areas. The decline in the incidence of rural poverty in the 1980s has been mainly attributed to a faster growth of agriculture, followed by infrastructure and human resource development, particularly female literacy (WB 1997; WB 2000). It has been hypothesised that the decline in the incidence of poverty is largely ascribed to the growth of RNAE, especially in respect of male workers. It is due to the fact that the daily real wage rates in rural non-agricultural occupations are higher than in agricultural sector and also rising over time (Sharma 2001; Biradar and Bagalokit 2001; 2004; Biradar 2006).

Table 4: Prevalence of Poverty in India, 1973-74 to 1999-2000

Year/Period	Rural	Urban	All
Number of poor (million)			
1973-74	261.3	60.0	321.3
1977-78	264.3	64.6	328.9
1983	252.0	70.9	322.9
1987-88	231.9	75.2	307.1
1993-94	244.0	76.3	320.3
1999-2000	193.2	67.0	260.2
Poverty ratio (%)			
1973-74	56.4	49.0	54.9
1977-78	53.1	45.2	51.3
1983	45.7	40.8	44.5
1987-88	39.1	38.2	38.9
1993-94	37.3	32.4	36.0
1999-2000	27.1	23.6	26.1
Annual growth rate (%)			
1973-74 to 77-78	0.23	1.49	0.47
1977-78 to 83	-0.95	1.88	-0.37
1983 to 1987-88	-1.65	1.18	-1.00
1987-88 to1993-94	0.85	0.24	0.70
1993-94 to1999-2000	-3.82	-2.14	-3.40
1973-74 to 1999-2000	-0.15	-0.13	-0.15

Source: Planning Commission, Government of India, New Delhi.

Regional Pattern of Poverty Incidence

The incidence and progress of poverty reduction is not uniform across the states. The data presented in Table 5 show that the states such as Orissa, Bihar, Assam, West Bengal and Uttar Pradesh had greater incidence of poverty, whereas Punjab, Haryana, Kerala and Himachal Pradesh had relatively lower incidence of it in 1999-2000. The data also indicate that a substantial and consistent fall in the incidence of rural poverty took place in most of the states, namely, Kerala, West Bengal, Andhra Pradesh, Gujarat, Haryana, Punjab, Karnataka, Maharashtra, Rajasthan and Tamil Nadu. No significant progress in poverty reduction was discernible in the states such as Bihar, Assam, Orissa, Madhya Pradesh and Uttar Pradesh. The varied levels of poverty prevalence and reduction have been attributed to the differential rates of employment growth in agriculture as well as in non-agriculture sector, the relative importance of which needs to be identified for effective policy intervention. An analysis of the distribution of poverty incidence by major states, ranked in ascending order of PCIA (agricultural growth), rate of literacy (human capital) and male and female RNAE (growth of rural non-agriculture) in the years of pre- (1983) and post-reform (1999-2000) periods, provides powerful policy insights to address the problem of poverty in a multi-dimensional framework.

**Table 5: Prevalence of Poverty in Major States in Rural India,
1973-74 to 1999-2000**

State	1973-74	1977-78	1983	1987-88	1993-94	1999-00
Andhra Pradesh	48.4	38.1	26.5	20.9	15.9	11.1
Assam	52.7	59.8	42.6	39.4	45.0	40.0
Bihar	63.0	63.3	64.4	52.6	58.2	44.3
Gujarat	46.4	41.8	29.8	28.7	22.2	13.2
Haryana	34.2	27.7	20.6	16.2	28.0	8.3
Himachal Pradesh	27.4	33.5	17.0	16.3	30.3	7.9
Karnataka	55.1	48.2	36.3	32.8	29.9	17.4
Kerala	59.2	51.5	39.0	29.1	25.8	9.4
Madhya Pradesh	62.7	62.5	48.9	41.9	40.6	37.1
Maharashtra	57.7	64.0	45.2	40.8	37.9	23.7
Orissa	67.3	72.4	67.5	57.6	49.7	48.0
Punjab	28.2	16.4	13.2	12.6	12.0	6.4
Rajasthan	44.8	35.9	33.5	33.2	26.5	13.7
Tamil Nadu	57.4	57.7	54.0	45.8	32.5	20.6
Uttar Pradesh	56.5	47.6	46.5	41.1	42.3	31.2
West Bengal	73.2	68.3	63.1	48.3	40.8	31.9
All India	56.4	53.1	45.7	39.1	37.3	27.1

Source: Planning Commission, Government of India, New Delhi.

The states with higher PCIA not only had smaller proportion of people living in poverty but also witnessed a rapid progress in reduction of it as compared to the states with lower PCIA during 1983 to 1999-2000. In other words, the incidence of poverty declined as agricultural growth picked up (Figure 9). However, there were some instances where the poverty reduction was substantial even in states with poor performance in agriculture. For instance, the states such as Tamil Nadu, Maharashtra and Bihar that had lower progress in agriculture experienced a steep decline in the incidence of rural poverty during the same period.

Figure 9: Prevalence of Poverty in Major States Ranked in Ascending Order of PCIA, 1983 and 1999-2000
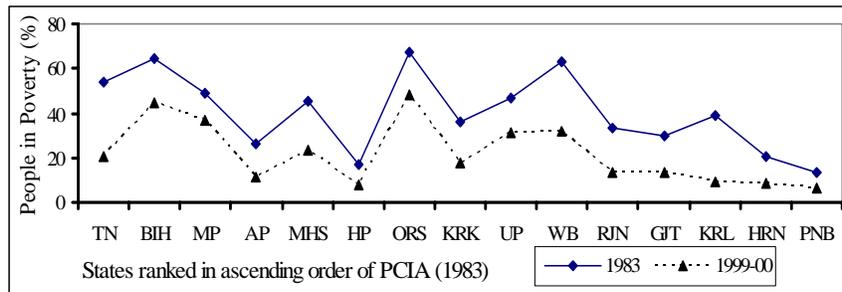
Source: Table 5.

Figure 10: Prevalence of Poverty in Major States Ranked in Ascending Order of Literacy Rate, 1983 and 1999-2000
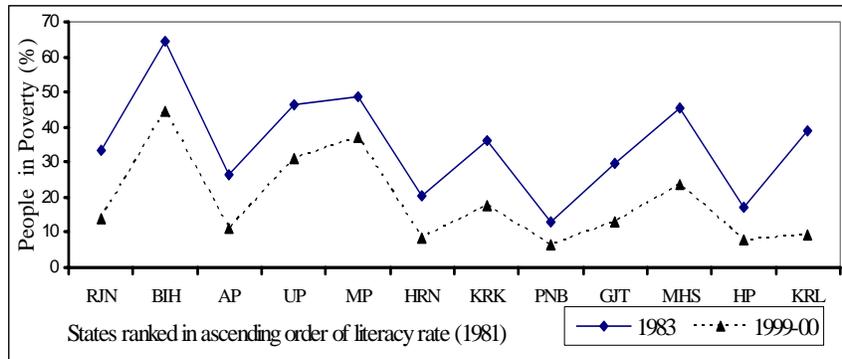
Source: Table 5.

Similarly, another interesting observation is that, in most cases, the states with lower rate of literacy *vis-à-vis* the states with higher ones had larger share of people in rural poverty. In other words, as the rate of literacy (growth of human

capital) increased, the incidence of poverty tended to decline across space and over time (Figure 10). A greater decline in the incidence of rural poverty took place in states with a higher rate of literacy as against the states with lower ones. This shows that the growth of human capital also played a vital role in determining the extent of occupational diversification in favour of RNAE and thereby contributing to a decline in the incidence of rural poverty in the post-reform as compared to the pre-reform period.

A striking feature is that the incidence of rural poverty was not significant in those states which had larger proportion of male workers in RNAE as compared to the states with lower ones (Figure 11). It has also been found that a rapid decline in the incidence of rural poverty took place in the states with higher share of male RNAE *vis-à-vis* the states with lower ones, except for West Bengal and Orissa. This clearly indicates that the growth of RNAE, particularly for males, contributed to a greater decline in the incidence of rural poverty in the 1990s. However, contrary to the above observation, the distribution of poverty incidence by the states ranked in ascending order of female RNAE lent support to the hypothesis that the growth of female RNAE was distress-induced. It is evident that most of the states with higher proportion of female RNAE had higher incidence of poverty as compared to the states with lower proportion of female RNAE during the pre- and post-reform periods (Figure 12).

Figure 11: Prevalence of Poverty in Major States Ranked in Ascending Order of Male RNAE, 1983 and 1999-2000
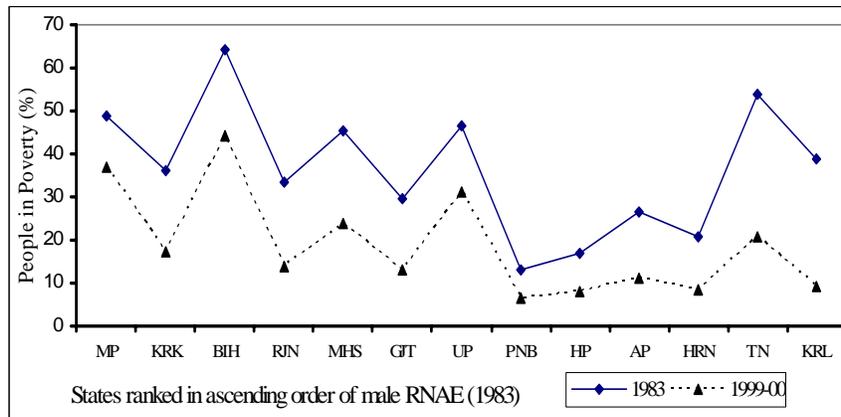
Source: Table 6.2

**Figure 12: Prevalence of Poverty in Major States Ranked in Ascending Order
of Female RNAE, 1983 and 1999-2000**
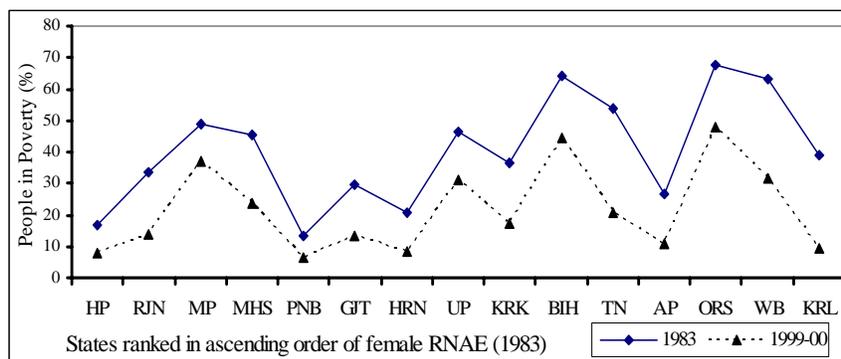
Source: Table 6.2

Although a positive association existed between female RNAE and poverty, the states with higher proportion of females in RNAE experienced relatively a greater decline in the incidence of poverty than the states with lower proportion of females in RNAE during 1983 to 1999-2000. The above regional pattern of poverty incidence clearly shows that the growth of agriculture, male RNAE and rate of literacy, *inter alia*, are the important sources of poverty reduction. But, the extent of poverty reduction due to each of these factors may provide a specific policy intervention to tackle the problem of poverty in rural areas.

Poverty Alleviation Through RNAE

It is a well known fact that in the 1990s there was a decline in the growth rate and quality of employment in agriculture and non-agriculture, particularly in rural areas[8]. An important and widely debated question is, how the incidence of rural poverty has sharply declined even when the growth rate and quality of rural employment has come down? In this context, we hypothesise that, firstly, in spite of a decline in the growth rate and quality of rural employment, the incidence of rural poverty has declined due to the shift of rural workers away from agriculture to rural non-agriculture where they get relatively higher wages. Secondly, the shift of labourers away from agriculture to rural non-agriculture may also raise the daily real wage rates of the existing labourers in agriculture, thereby contributing to a further

---

[8] The quality of employment can be measured in terms of percentage of casual wage employment to total rural employment, which has been on the rise, and a greater participation of workers in casual wage employment may reduce the total wage earnings of the labourers (Biradar and Bagalkoti, 2004; Biradar 2006). This may cause further impoverishment.

decline in the incidence of poverty. It has also been argued that since the rural non-agricultural activities taken up by the poor are not the same as those taken up by the non-poor, the aggregate decline in the incidence of poverty cannot be strictly attributed to the aggregate growth of RNAE[9]. However, if the poor take up rural non-agricultural jobs where the real wage earnings and income levels are higher than in agriculture, the incidence of rural poverty, *a priori*, is expected to decline. In the process of economic growth in rural areas, the incidence of rural poverty and the proportion of workers, particularly in respect of males, in RNAE have tended to move in opposite direction but not at the same slope, implying that the growth of RNAE, however, has partial poverty reduction effect (Figure 13).

Figure 13: Nexus between RNAE and Poverty in India, 1973-74 to 1999-2000
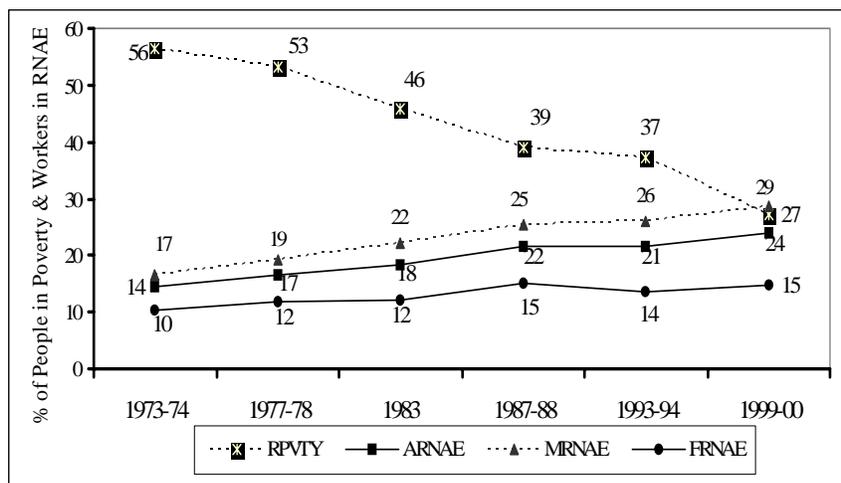
Note: RPVTY: Incidence of rural poverty; ARNAE: All rural non-agricultural employment; MRNAE: Male rural non-agricultural employment; FRNAE: Female rural non-agricultural employment.

Econometric Analysis

The incidence of poverty is due to many factors, most of which are cause-and-effect types and hence, it is rather difficult to identify exact causes and effects. Although several factors contributed to poverty reduction, for the present study,

---

[9]   As the entire growth of RNAE may not be from the poor households alone, the daily real wage rates of agricultural labourers in the rural non-agricultural occupations and an increase in the agricultural wages due to shift of workers in favour of RNAE are considered as other important ways for examining the contribution of RNAE towards poverty reduction.

depending on the availability of data, only the growth of agriculture and rural non-agriculture, development of human capital and the Government programmes/policies were considered as important sources of poverty reduction. The growth of agriculture is captured through per capita income from agriculture and the daily real wage rates of male and female agricultural labourers, the growth of rural non-agriculture is captured through the proportion of male/female workers in RNAE and the daily real wage rates of male and female agricultural labourers in the rural non-agricultural occupations, the development of human capital is measured in terms of rate of male/female literacy and the Government programmes/policies are captured through rural per capita public expenditure for rural development and social services.

In addition, poverty reduction can also be caused by a rise in the agricultural wages resulting from a shift of workers away from agriculture in favour of the rural non-agricultural sector. This has been captured through a change in the daily real wage rates of male and female agricultural labourers between 1983 and 1999-2000. Among these sources of poverty reduction, the dominant forces are explored by estimating the elasticity of poverty. Therefore, with a view to estimating the elasticity of poverty, the log-linear simple regression model for each of the explanatory variable for the year 1999-2000 has been formulated, as most of them are highly correlated among themselves.

$$\text{Log PVTY} = \alpha + \beta \log \text{PCIA} + \upsilon$$
$$\text{Log PVTY} = \alpha + \beta \log \text{WRM/FLA} + \upsilon \qquad \text{.........(1)}$$

$$\text{Log PVTY} = \alpha + \beta \log \text{M/FRNAE} + \upsilon$$
$$\text{Log PVTY} = \alpha + \beta \log \text{WRM/FLNA} + \upsilon \qquad \text{.........(2)}$$

$$\text{Log PVTY} = \alpha + \beta \log \text{ÄWRM/FLA} + \upsilon \qquad \text{.........(3)}$$
$$\text{Log PVTY} = \alpha + \beta \log \text{RoM/FL} + \upsilon \qquad \text{.........(4)}$$
$$\text{Log PVTY} = \alpha + \beta \log \text{GVTPOL} + \upsilon \qquad \text{.........(5)}$$

While PVTY refers to the incidence of rural poverty, PCIA refers to the per capita net income from agriculture, WRM/FLA refers to the daily real wage rates of agricultural male/female labourers in agricultural occupations, M/FRNAE refers to the proportion of male/female workers in RNAE, WRM/FLNA refers to the daily real wage rates of agricultural male/female labourers in rural non-agricultural occupations, RoM/FL refers to the rate of male/female literacy, GVTPOL refers to the Government/ programmes policy in terms of rural per capita public expenditure for rural development and social services and ÄWRM/FLA refers to the change in the daily real wage rates of male and female agricultural labourers in agricultural occupations in 1999-2000 over 1983 (used to capture the indirect impact of the growth of RNAE on poverty reduction). While α and β are constant and co-efficient of parameters, respectively, υ is random error term in each equation.

Table 6: Regression Results for the Sources of Poverty Reduction in Rural India, 1999-2000

Model	Explanatory Variable	α	β	R^2	Adjusted R^2	F
1	PCIA	4.294 (3.849)	-0.604*** (-2.735)	0.365	0.316	7.481
	WRMLA	3.077 (7.389)	-0.775*** (-4.423)	0.601	0.570	19.567
	WRFLA	3.092 (8.062)	-0.765*** (4.285)	0.585	0.553	18.553
2	MRNAE	3.264 (5.489)	-0.687*** (-3.405)	0.472	0.431	11.600
	FRNAE	0.931 (3.021)	0.282 (1.058)	0.079	0.008	1.119
	WRMLN	3.092 (5.661)	-0.686*** (-3.981)	0.470	0.429	11.547
	WRFLN	2.754 (4.481)	-0.564** (-2.464)	0.318	0.266	6.002
3	ÄWRMLA	2.508 (6.757)	-0.690*** (-3.435)	0.476	0.435	11.800
	ÄWRFLA	2.234 (9.075)	-0.751*** (-4.095)	0.563	0.530	16.773
4	RoML	5.948 (2.098)	-0.418* (-1.658)	0.175	0.112	2.750
	RoFL	3.570 (3.405)	-0.524** (-2.220)	0.275	0.219	4.927
5	GVTPOL	2.243 (2.942)	-0.342 (-1.311)	0.117	0.110	1.719

Note: Figures in parentheses indicate 't' values and ***, ** & * refer to the statistical significance at 1, 5 & 10 per cent level, respectively; Number of observation was 15 in each equation.

The results of the log-linear simple regression, based on cross-section data, are provided in Table 6. The data shows that the growth of agriculture captured through PCIA and also real wage rates agricultural labourers, the growth of non-agricultural sector captured through the proportion of workers in RNAE and real wage rates and the development of human capital, measured in terms of literacy rate, were found to be the important reasons for poverty reduction in the 1990s. A strong and negative association was found between PCIA and poverty, implying

that the growth of agriculture contributes to a decline in the incidence of poverty. The elasticity of PCIA indicates that one per cent increase in per capita income from agriculture leads to 0.604 per cent decline in poverty. A significant impact of agricultural growth on poverty reduction was evident from a strong and negative association that existed between the daily real wage rates for both male and female labourers in agricultural occupations and poverty. The elasticity of WRMLA and WRFLA indicates that one per cent rise in the daily real wage rates for male and female labourers in agricultural occupations results in 0.775 and 0.765 per cent decline in poverty, respectively. This follows that the growth of agriculture resulting in a rapid rise in the agricultural wage rates contributes significantly to a decline in poverty.

Similarly, in the case of rural non-agricultural sector, it has been found that a strong and negative association existed between the proportion of male workers in RNAE and poverty incidence, implying that the growth of male RNAE has immense poverty reduction effect. The elasticity of MRNAE shows that 1 per cent increase in male RNAE results in 0.687 per cent decline in poverty. The daily real wage rate of male labourers in non-agricultural occupations was found to have a significant impact on poverty reduction. It is evident from the elasticity of WRMLA that one per cent increase in the daily real wage rates of male agricultural labourers leads to as much as 0.686 per cent decline in poverty. In the case of females, on the other hand, a positive but insignificant association existed between female RNAE and poverty incidence. This appears to imply that the female RNAE in which they involved appears to be less productive, casual/contractual and low paid jobs, and their participation in RNAE might have led to a decline or stagnation of daily real wage rates as well as in the income levels in the rural non-agricultural sector, resulting in a further impoverishment and/or no progress in poverty reduction due to the growth of female RNAE.

However, the impact of daily real wage rates on poverty reduction does not support the above observation that the growth of female RNAE is in a residual sector, low productive, low paid, dead-end jobs, though it may be distress-induced. A positive but weak association of poverty with female RNAE and a strong negative association with the daily real wage rates may indicate that the participation of females in casual wage employment in the non-agricultural sector has poverty reduction effect, as the wage rates are increasing significantly. This may be due to the fact that the daily real wage rates of male or female labourers are estimated form only casual type of employment and not from other employment status such as self-employment (and regular/salaried employment). The female RNAE also includes self-employment and their participation in self-employment seemed to have resulted in a decline in the real wages/income levels and thereby resulting in a less and/or no impact on poverty reduction in rural areas. That is why the daily real wage rate for females, which capture only from causal wage employment, was significantly and

negatively associated and that of female RNAE was insignificantly and positively associated with the incidence of poverty. If we consider the extent of poverty reduction due to the growth of RNAE and wage rates for both male and female workers, the latter has a greater poverty reduction effect than the former. It is evident that the beta values of MRNAE, WRMLA and WRMLNA were found to be higher than that of FRNAE, WRFLA and WRFLNA.

An interesting discovery of the study is that the indirect impact of growth of male and female RNAE (measured in terms of ÄWRM/FLA) on poverty reduction has been rather quite significant. A strong and negative association existed between the ÄWRMLA and ÄWRFLA and the incidence of poverty. The elasticity of ÄWRMLA and ÄWRFLA indicates that one per cent increase in the daily real wage rates in agriculture due to shifting of male and female workers towards non-agricultural occupations leads to 0.690 and 0.751 per cent decline in poverty incidence. This simply follows that the shift of male and female labourers away from agriculture to the rural non-agricultural sector tends to raise the daily real wage rates of the existing workers in agriculture and thereby contributing to a further decline in the incidence of poverty. Such decline in the incidence of poverty is little higher in the case of occupational diversification by females as compared to males. The occupational diversification in favour of RNAE has much beneficial direct and indirect impact on poverty reduction in the countryside.

If we take literacy as an index of human capital, it has been found that a strong and negative association existed between the incidence of RoML and RoFL. This may imply that the workers with education, especially at higher levels of educational attainments, are more likely to access qualitative jobs in the rural non-agricultural sector and earn more wages/income, thereby contributing to a decline in the incidence of poverty. The elasticity of RoML and RoFL shows that one per cent increase in the rate of male and female literacy results in 0.418 and 0.524 per cent decline in poverty, respectively. In a knowledge-based economy, human resource development, especially in respect to females, is one of the key factors which determine access to productive RNAE and thereby contributing to a faster decline in poverty. Finally, a negative but weak association has been found between the rural per capita public expenditure for rural development and social services (GVTPOL) and the incidence of rural poverty. This appears to imply that the Government programmes have not made a significant impact on reduction of poverty. It is evident that the occupational diversification in favour of RNAE for both males and females has direct and indirect impact on poverty reduction. In view of a gradual decline in the pubic expenditure for rural development including poverty alleviation programmes, the growth of RNAE strongly supported by agricultural growth and human resource development, can be considered as a policy intervention to tackle the age-old problems of unemployment and poverty in rural areas.

Conclusion

The foregoing analysis reveals that the size of the rural non-agricultural sector has been expanding with varying degrees across genders and regions, but the rate at which it increased during the pre-reform period has not sustained during the post-reform period. It has been observed that the growth rates of non-agricultural employment, especially in rural areas, have fluctuated in accordance with the growth rates of agricultural income and food grains. Whenever the growth of agricultural income and food grains were found to be higher, the growth rates of workers in RNAE, especially females, were also recorded to be lower. This implies that the growth of employment in the rural non-agricultural sector, especially in respect to females, tends to move in opposite direction to the growth rate of agricultural income and food grains. But the cumulative proportion of workers in RNAE continued to increase; the increase was much faster in the case of males as compared to females.

The regional pattern of RNAE illustrates that the states, ranked with higher per capita income from agriculture, rate of male and female literacy and also current daily status unemployment rate *vis-à-vis* the states ranked with lower ones, had greater proportion of male workers in RNAE. A greater increase took place in the proportion of male RNAE in the states which are more advanced in agriculture and male literacy as against the states with lower levels during the post-reform period. At the same time, the states with higher incidence of unemployment rates also had higher share of male workers in RNAE.

In respect to female workers, it has been found that the states with higher per capita income from agriculture had lower proportion of female workers in RNAE as against the states with lower ones. In the states of agricultural prosperity, the female workers are less likely to be forced to take up jobs within or outside agriculture unless they are poor or highly paid. Similarly, the states with higher incidence of unemployment had greater proportion of female workers in RNAE than that of the states with lower ones during the same period. This observation lents support to the distress-led diversification of RNAE in respect to female workers, though it is not necessarily a residual sector. A regional pattern of poverty incidence, on the other hand, shows that the states with higher per capita income from agriculture, rate of literacy and male RNAE had smaller proportion of people in rural poverty and also witnessed a rapid progress in reduction of it, as compared to the states with lower ones during the post-reform, as compared to the pre-reform period.

The growth of income and daily real wage rates in agriculture, the growth of male RNAE and daily real wage earnings in the rural non-agricultural occupations, increase in the daily real wage rates in the agricultural occupations due to the shift of workers in favour of the rural non-agricultural sector, rate of literacy and rural per capita public expenditure for rural development and social services were found to

be the important sources of poverty reduction. It is evident that poverty alleviation cannot be done in isolation. It requires a multi-dimensional approach. The growth of RNAE followed by agricultural growth and human resource development, for both males and females belonging to the weaker sections of the society, appears to have a greater poverty reduction effect in the 1990s.

An important observation of the study is that a shift of workers away from agriculture in favour of the rural non-agricultural sector tends to raise the wage rates of the existing labourers in agriculture, thereby contributing to a decline in poverty. Occupational diversification in favour of RNAE, therefore, has dual impact, direct and indirect, on reduction of poverty. It can be concluded that in view of a gradual decline in the share of the Government expenditure for rural development and poverty alleviation programmes, the promotion of RNAE, followed by agricultural growth and human resource development, can be considered as an important policy intervention to tackle the long-standing problem of poverty in rural areas.

References

Bhalla, Sheila (1993). Test of Some Propositions about the Dynamics of Changes of the Rural Workforce Structure. *The Indian Journal of Labour Economics*, XXXVI (3): 428-39.

——— (1997). The Rise and Fall of Workforce Diversification Processes in Rural India. In G K Chadha and Alakh N Sharma (eds), *Growth, Employment and Poverty: Change and Continuity in Rural India*. New Delhi: Vikas Publishing House Pvt. Ltd.

Bhatt, P R (2003). Changes in Workforce Structure in India. *The Indian Journal of Labour Economics*, XLVI (4): 877-86

Biradar, R R (2004). Human Capital Base of Labour Force among Social Groups in India: Emerging Issues and Challenges. *The Indian Journal of Labour Economics*, LXVII (4): 731-48.

——— (2006). Rural Non-Farm Activities in India: Emerging Issues. In Sabanna Talwar (ed), *Agriculture and Globalisation*. New Delhi: Serial Publications.

——— (2007). Growth of Rural Non-Farm Activities in Karnataka: Emerging Issues and Prospects. In Jayasheela (ed), *Rural Karnataka*. New Delhi: Serial Publications.

——— and S T Bagalkoti (2004). Growth of Rural Non-Farm Activities in India: A Spatio-Temporal Analysis. In P Purushotham (ed), *Rural Non-Farm Employment*. Hyderabad: National Institute for Rural Development.

——— and S T Bagalkoti (2001). Changing Facets of Employment in Rural India: Emerging Issues and Challenges. *Indian Journal of Agricultural Economics*, LVI (3): 538-52.

Chadha, G K (2001). Impact of Economic Reforms on Rural Employment: No Smooth Sailing Anticipated. *Indian Journal of Agricultural Economics*, LVI (3): 491-525.

——— (2004). Human Capital Base of the Indian Labour Market: Identifying Worry Spots. *The Indian Journal Labour Economics*, XXXVII (21): 3-38.

——— and P P Sahu (2002). Post-Reform Setbacks in Rural Employment: Issues that Need Further Scrutiny. *Economic and Political Weekly*, XXXVI (21): 1998-2026.

Corral, L and T Reardon (2001). Rural Non-farm Incomes in Nicaragua. *World Development*, XXIX (3): 427-42 (Special Issue).

Dev, S Mahendra (1990). Non-Agricultural Employment in Rural India: Evidence at a Dis-aggregate Level. *Economic and Political Weekly*, XXVI (28): 1526-36.

——— (2000). Economic Reforms, Poverty, Income Distribution and Employment. *Economic and Political Weekly*, XXXV (10): 823-35.

Ferreira, F H G and P Lanjouw (2001). Rural Non-farm Activities and Poverty in the Brazilian Northeast. *World Development*, XXIX (3): 509-628 (Special Issue).

Government of India (GoI) (2003). Rural Labour Enquiry Report on Wages and Earnings of Rural Labour Households 1999-2000, *55th Round of NSS*. Shimla: Ministry of Labour, Government of India.

——— (2003a). *Statistical Abstract, India 2003, Central Statistical Organisation.* New Delhi: Ministry of Statistics and Programme Implementation, Government of India.

Jayaraj, D (1994). Determinants of Rural Non-agricultural Employment. In Pravin Visaria and Rakesh Basant (eds), *Non-Agricultural Employment in India: Trends and Prospects*. New Delhi: Sage Publications.

Lanjouw, Peter (2001). Nonfarm Employment and Poverty in Rural El Salvador. *World Development*, XXIX (3): 529-47.

——— and Abusaleh Shariff (2004). Rural Non-Farm Employment in India: Access, Income and Poverty Impact. *Economic and Political Weekly*, XXXIX (40): 4429-46.

Liedholm, Carl and Peter Kilby (1989). The Role of Nonfarm Activities in the Rural Economy. In Jeoffrey G William and V R Panchamukhi (eds), *The Balance Between the Industry and Agriculture in Economic Development: Sector Proportions, Vol 2*. London: ILO/Macmilan Press.

National Sample Survey Organisation (NSSO) (1981). Report on the Second Quinquennial Survey on Employment and Unemployment, All India, NSS 32nd Round. *Sarvekshana*, V (1 & 2). New Delhi: Government of India.

——— (1988). Report on the Third Quinquennial Survey on Employment and Unemployment, All India. *Sarvekshana*, XI(4). New Delhi: Government of India.

——— (1990). Results of the Fourth Quinquennial Survey on Employment and Unemployment, All India, NSSO 43rd Round (July 1987-June 1988). *Sarvekshana*, Special Issue. New Delhi: Government of India.

——— (1997). Key Results on Employment and Unemployment in India 1993-94, Fifth Quinquennial Survey, NSS 50th Round (July 1993- June 1994). *NSSO Report No.406*. New Delhi: Government of India.

——— (2001). Employment and Unemployment Situation in India 1999-2000, Part - I, NSSO 55th Round (July 1999-June 2000). *NSSO Report No. 458*. New Delhi: Ministry of Statistics and Programme Implementation, Government of India.

Parthasarathy, G, Shameem and B Sambi Reddy (1998). Determinants of Rural Non-Agricultural Employment: The Indian Case. *Indian Journal of Agricultural Economics*, LIII (2): 139-54.

Rajasekhar, D and R R Biradar (1998). *Rural Non-Farm Activities in Karnataka*. Bangalore: Institute for Social and Economic Change (Mimeo).

Reardon, T, J Berdegue and G Escobar (2001). Rural Non-farm Employment and Incomes in Latin America: Overview and Policy Implications. *World Development*, XXIX (3): 395-409 (Special Issue).

Ruben, R and M Van den Berg (2001). Nonfarm Employment and Poverty Alleviation of Rural Farm Households in Honduras. *World Development*, XXIX (3): 549-60 (Special Issue).

Samuel, P S Ho (1979). Decentralized Industrialization and Rural Development: Evidence from Taiwan. *Economic Development and Cultural Change*, XX (1): 77-96.

Sharma, H R (2001). Employment and Wage Earnings of Agricultural Labourers: A State-wise Analysis. *The Indian Journal of Labour Economics*, XLIV (1): 27-38.

Sundaram, K (2001). Employment and Poverty in 1990s: Further Results from NSS 55th Round Employment-Unemployment Survey 1999-2000. *Economic and Political Weekly*, XXXVI (32): 3039-49.

——— and S D Tendulkar (2003). Poverty among Social and Economic Groups in India in 1990s. *Economic and Political Weekly*, XXXVII (50): 5263-76.

Unni, Jeemol (1991). Regional Variations in Rural Non-agricultural Employment: An Exploratory Analysis. *Economic and Political Weekly*, XXVI (3): 109-22.

——— (1996). Non-Agricultural Employment and Rural Livelihoods: Macro *Vis-à-vis* Micro View. *The Indian Journal of Labour Economics*, XXXIX (4): 795-807.

——— (1997). Employment and Wages among Rural Labourers: Some Recent Trends. *Indian Journal of Agricultural Economics*, LII (1): 59-72.

Vaidyanathan, A (1986). Labour Use in Rural India: A Study of Spatial and Temporal Variations. *Economic and Political Weekly*, XXI (52): A-130-46.

Visaria, Pravin (1995). Rural Non-Farm Employment in India: Trends and Issues for Research. *Indian Journal of Agricultural Economics*, L (3): 398-409.

World Bank (WB) (1997). *India: Achievements and Challenges in Reducing Poverty*. Washington, D.C.: Oxford University Press.

——— (2000). *India: Reducing Poverty, Accelerating Development*. Washington, D.C.: Oxford University Press.

——— (2001). *Global Economic Prospects and the Developing Countries*. Washington D.C.: Oxford University Press.

Book Reviews

International Handbook on Privatisation. **David Parker and David Saal (eds). Cheltenham, UK: Edward Elgar. 2003. Pp xvii + 608.**

Programmes favoured by several economists and supported by international bodies, such as the IMF, World Bank etc., have been going on in various forms in various countries all over the world since 1980s with several success stories, though complemented with not so successful stories too. In 2000, global receipts are of the order of $ 200 billion. Why privatise, who are likely to privatise (right or left wing governments), what is to be privatised, when to do it, how to do it, whom to favour and whom to ignore, who may gain and who may lose? What would be the role of the governments after? What has been the international experience? These are some of the pertinent and mind-blowing questions on which this handbook provides rich information, theory covering not only privatisation but also regulation, analytical and empirical analyses, and some country-wise detailed case studies by 32 experts drawn from across the globe. The editors say in the Preface, "This handbook is intended to provide a comprehensive source for policy makers, managers and students keen to understand privatisation theory, the privatisation process and its content, and to learn lessons from the privatisation experiences of countries in the developed and developing worlds and the transition economies of Central and Eastern Europe" (Pg xi). The book, with 25 chapters presented in five parts, apart from an excellent introduction chapter by the editors, is indeed up to the editors' intention and inquisitive readers' satisfaction.

Essays in this book categorically point out that the left-wing governments are not unenthusiastic towards privatisation programmes. Privatisation may take different forms such as outright sale of shares/assets to public or to domestic and/ or foreign companies, or build-operate-transfer schemes etc. Reasons for privatising are several, and include raising cash resources for public spending without unpopular tax increases (with or without losing control over the enterprises), reducing government debt, developing markets, favouring special interest groups, increasing economic efficiency, growth, foreign investment, employment, competitiveness, poverty reduction etc. Obviously the impacts of privatisation would be both at firm level and the economy level. One commendable feature of the book is that some papers deal with the impacts on social welfare also.

Part 1 of the book covers privatisation in theory and practice. Megginson and Netter present the history and methods of privatisation since ancient times to date. Robinson, viewing that state ownership has numerous disadvantages ['what is owned by everyone is perceived to be owned by no-one' (Pg 46)] distinguishes between privatisation, liberalisation and deregulation. He argues that markets must be liberalised to fully realise the potential benefits of privatisation. Willner is skeptical

about the true benefits of privatisation. He criticises that cost efficiency alone should not have been the criterion to disfavour state ownership. Allocative efficiency is an equally important criterion for which the state ownership is superior. Discussing various methods of privatisation, Garaham argues that there is no one ideal method of privatisation.

Part 2 covers privatisation in developed economies (European Union, Australia, Canada and the United States). Parker provides a brief but excellent survey of the privatisation activity in the European Union. Though there is some similarity in the privatisation programmes across the countries, the similarity is however misleading, and different countries maintained differing degrees of enthusiasm – mostly based on pragmatic rather than ideological reasons (except in UK and France). While there are mainly four reasons for privatisation in the EU (efficiency promotion, domestic capital markets development, reducing government debt and a response to the EU directives on market liberalisation), efficiency gain does not seem to be the prime reason. Distinguishing between static and dynamic efficiency gains, Parker wonders whether privatisation is conducive enough for the latter variety. Citing several studies, he points out that "empirical studies of the comparative efficiency of public versus private sector firms (…..) suggest that, while private enterprises are sometimes more efficient than their state-owned counterparts, state enterprises can be as efficient, especially in markets where there is little or no product competition…" (Pg 120). It is also worth noting that several advanced European countries too are averse to foreign capital and foreign ownerships.

Parker's discussion on the impacts of privatisation on social welfare is quite enlightening. He laments, "the privatisation literature tends to be dominated by concern with economic efficiency. Issues to do with power and control in social welfare terms either are secondary issues in this literature or, much more frequently, are ignored altogether" (Pg 125). He points out, "Across the EU, privatisation implies a shift in economic power from the state to private capital markets with an associated redistribution of income … to a different set of interests. More specifically, there is evidence that privatisation is leading to a shift in economic power and income to large business groupings" (Pg 123). State influence in countering the adverse effects on economic welfare is removed with large-scale, particularly transnational, private enterprise. Privatisation takes less favourable view of employment, employment rights, wages and trade union collective bargaining etc. Once these were being treated as "rights", but nowadays these are viewed as "inefficiencies". Who are the losers? "The losers are those interests now less favoured by government, usually the trade unions and those vulnerable to unemployment and wage cuts post-privatisation. In particular, those workers most likely to lose are the lower skilled, less well-educated workers…." (Pg 124). Yet, Parker is not against privatisation. He only pleads for a far more critical evaluation

of the privatisation programmes taking into account long-term impacts on industry and social welfare.

Boardman, Laurin and Vining study the privatisation and future prospects in North America. In Canada there have been significant gains, whereas in the US since the government ownership is anyway less, the efficiency and the welfare effects are little. Hodge studies the Australian experience where the federal government and the state governments have maintained different stances on privatisation. He provides two successful case studies – electricity and telecommunication sectors. Arguing for postal privatisation in the United States, Crew and Kleindorfer say, there "are no strong technological, strategic or economic reasons why the postal service should be publicly operated" (Pg 189). (This reviewer too maintains the same opinion with respect to the Indian Postal Department, which refuses to improve its efficiency despite its huge infrastructure backup and the competition it faces from several private courier services!)

Part 3 covers developing economies (Brazil, China, Mexico, Chile, South Africa, and sub-Saharan Africa) with discussion on assessment of the privatisation by Cook and Kirkpatrick, explaining the difficulties in assessing the impact of privatisation, and how neither theory nor empirical studies (due to methodological problems) could settle the debate on ownership and economic performance. Their discussion covers macro-level and micro-level impacts as well as social impacts. They conclude, "improvements in public enterprise performance and in the contribution to economic development involve more than simply changing ownership from the public to the private sector" (Pg 217). Issues such as corporate governance, institutional capacity, market competition and political economy are also involved.

Baer discourses on the experiences in Brazil and laments that though privatisation helped in fiscal adjustments, efficiency improvement and capital inflow, it however worsened the traditional problem of inequality. Discussing the Chinese experience, Chai points out that there are at least 15 concepts of privatisation. He lists out various lessons that other developing countries may learn from the Chinese experience. These include: some privatisation in any form is better than none; more privatisation is better than less; establishment of social safety net to protect the victims of full privatisation and functioning capital market are preconditions for privatisation; and most importantly, privatisation is absolutely necessary to achieve sustained intensive growth (brought through total factor productivity than through increased use of inputs). Ramirez informs that public opinion in Lain America is opposed to the idea of privatisations since these programmes have been generating clear 'winners' without the obligation of 'losers' being compensated. He says, "The streamlining of the Chilean and Mexican economies has yet to produce clear and sustained increases in economic efficiency and productivity, while it is apparent that privatisation has come at the steep cost of increased economic concentration,

anti-competitive practices, economic and financial instability, corruption and criminal behaviour" (Pg 287). His word of caution: "At a minimum, it would be wise to avoid the simultaneous privatisation of several public service sectors that have newly emerging regulatory systems and where administrative and operational flaws are likely to be discovered only after privatisation" (Pg 287). Schwella discusses at length the highly complex nature of political, economic and social issues (including the language problem) in South Africa that have relevance to the difficulties in making privatisation policy. Bennell discusses the case of sub-Saharan Africa where in many countries corruption and lack of transparency are the major concerns for prospective investors.

In Part 4, Filatotchev discusses theory and concepts of privatisation and corporate governance covering the transition economies of central and eastern Europe (Russia, Czech Republic, Poland, Hungary and Ukraine). The modes of privatisation differed from country to country, thus resulting in a diverse range of ownership structures and corporate governance mechanisms. Hungary is considered to have created a very liberal climate for foreign investors by allowing repatriation of profits and 100 per cent foreign ownership. Two analytical models are presented to study the implications of ownership patterns, particularly the differences between insider-controlled and outsider-controlled firms, and privatisation impact on the firm's investment and performance. Filatotchev argues that protection of minority shareholders is quite important for enterprise restructuring and efficient governance.

Hare and Muravyev view that privatisation in Russia was pursued in excessive haste without adequate restructuring of production. The resulting ownership pattern with several barriers to change (banks, financial markets, labor markets etc.) did not yield any dramatic improvements in economic performance. The other papers in this part are by Mejstrik on privatisation and corporate governance in Czech Republic, by Mickiewicz and Baltowski on Polish piecemeal privatisation, by Major on privatisation in Hungary and its aftermath, and by Estrin and Rosevear on privatisation in Ukraine. Czech Republic, Poland and Hungarian cases are relatively successful stories, while Ukraine case is not so successful mostly due to the insider-ownership structures that resulted.

Part 5 presents essays on regulating privatised industries. Electricity, water, communications, transport etc. are essentials for life. Such utility sectors have accounted for the largest portion of the privatisation programmes so far. Usually such sectors are monopolies and competition is meagre. Besides, when natural monopolies (such as the utility sectors) with high fixed costs prevail, competition would even be uneconomic. When such sectors are completely left in the hands of private sector, consumers may have to be protected from undue high prices and poor services. In other words, whenever markets fail, state regulation becomes necessary, or even essential. Thus, whether governments should retain some control after the privatisation, or not, is the issue here. If governments have to indulge in

regulation, should they directly regulate, or independent regulatory bodies that could, in principle, work without political hindrance be set up – is another issue.

"Whenever there is no competition, or the competition is not strong enough to prevent a public utility from exploiting its customers, government regulation of public utilities remains on the agenda of policy and, therefore, remains an important subject of economic theory" (Bos, Pg 478). Theory of regulation is one of the important steps to properly model governments' behaviour. Bos's paper on theory and concepts of regulation and Weyman-Jones's paper on regulating prices and profits are analytically interesting pointing out the difficulties in privatisation of public utility sectors and in devising effective regulatory systems. After discussing a general framework of the theory, Bos presents a game theoretic model with information asymmetries. The welfare-maximising regulator is the principal and the personal-income-maximising manager of the enterprise is the agent. After noting the inadequacies of some simple regulating rules (such as iterative process of regulated prices and yardstick competition), Bos discusses information-demanding regulatory rules and price cap regulation [RPI-X formula][1] , and argues that imperfectly informed regulators may set wrong incentives for the managers of the regulated public utilities. His paper also discusses the importance of quality regulation. Weyman-Jones's paper complements the paper by Bos, specifically addressing certain practical difficulties faced mostly in the context of price cap regulation using (RPI-X) formulation, ie., how to work out the RPI and set X.

Comparative analysis of regulatory systems by Ogus is a thought-provoking essay going beyond economic regulation, and covering social regulation also. The narrow concepts of economic 'regulation' and 'regulatory law' etc. are of recent origin and predominantly of Anglo-American origin based on the economic notion of public law responses to market failure. His discussion of administrative laws and regulatory traditions is quite enlightening. Ogus rejects the notion that power of judges to control administrative activity reflects the level of economic development. Arguing that it depends more on the independence of the judiciary, he says, "It has been persuasively argued that the world's most active judiciary, in this case, is to be found in India" (Pg 517). According to him, "American judges take a harder look at the reasonableness of administrative actions (so-called 'substantial judicial review'), whereas their English counterparts have rather concentrated on whether appropriate procedures have been observed" (Pg 518). Though the objectives and principles of regulation have been tending to be similar across nations, the institutional and procedural characters of regulatory systems are better understood within each national jurisdiction's culture.

[1] RPI: Retail Price Index, and X a constant set by the regulator reflecting productivity increases of the public utility. By varying X from sector to sector, [RPI-X] formulation, equivalent to rate of return regulation, regulates the maximum average revenue that a company is allowed to charge for its outputs.

Parker discusses the problems and challenges in privatisation and regulation of public utilities for developing economies where the institutional weaknesses exist. Privatisation does not mean mere transfer of the ownership of the assets to private parties. Not only it may entail market liberalisation, competition and regulation, but also requires supporting institutions including protected property rights, effective contract laws, supportive and efficient pro-competition legislation, as well as developed capital markets. Results of privatisation can differ according to whether such institutions exist or not. In several countries such institutions don't exist; even if they do, they do not function efficiently. Under such circumstances, the forms, which the competition and regulation policies take, ultimately decide whether the poverty levels in these countries would reduce or not. Each country has to work out the form of regulation within its own institutional framework that best meets its needs. Pointing out the difficulties, he warns however that even states may fail.

Earlier, economic consensus used to be that natural monopolies are better left with state ownership. Nowadays, this view has changed substantially. The idea that such monopolies can be broken up and some components of them can be brought under competitive environment led to privatising them. Saal elaborates on the UK's experience on restructuring, regulation and liberalisation of privatised utilities. Telecommunications, gas and electricity industries were once nationalised, and are now privatised again. The restructuring of these industries to promote competition did not turn out to be as easy as were the initial high hopes. The process has been demanding constant and permanent industry-specific regulation. "… even the best designed restructuring plans are likely to require a substantial amount of post-privatisation adjustment before effective competition is brought about. …. even when effective competition in potentially competitive markets is achieved, the need for a substantial regulatory system will remain" (Pg 577). Thus the state's role could not be diminished and state intervention in these cases will be a permanent feature even after privatisation.

The book thus indeed contains a "thorough summary of the rationale, methods, processes and outcomes of privatisation at both the theoretical and empirical levels and for the full range of economies" (Pg 1). One appreciable feature in the editorial effort is not to simply present a biased one-sided perspective but also valid counter perspectives on privatisation. It is not a 'handbook' but an information bank, and highly recommended for all those (including who are remotely) concerned with the topic.

Some comments/questions still remain in the end. Are privatisation and private ownership relevant issues only for capital-endowed countries? What if some countries do not have any worthwhile capital assets to privatise? Is state ownership necessary at least in the initial stages of capital build-up? Shouldn't a justifiable social rationale be the more relevant criterion for the presence or absence

of the state in any economic sector (including utilities), instead of some criteria based on market prices? Is there a guarantee that the economic consensus will not turn around in future again favouring the state ownership? What will be the costs to the society then? May be these are somewhat philosophical issues.

Some decades ago whenever some private enterprises in India fell sick, politicians used to argue that such loss-making enterprises should be taken over by the government instead of allowing them to be closed down forever. Nowadays, politicians of the same variety however argue that profit-making public enterprises should not be privatised – implying that loss-making public enterprises may be privatised! Such phenomena make me point out a shortcoming of the book. Discussion of the political economic aspects, which certainly play quite an important role in privatisation decisions and policies, is rather inadequate in some (if not most) of the essays. Hope the authors and editors will cover these aspects more in future.

Economic Analysis Unit   ***N S S Narayana***
Indian Statistical Institute
Bangalore – 560 059.

***Development in Karnataka: Challenges of Governance, Equity and Empowerment.* Gopal K Kadekodi, Ravi Kanbur and Vijayendra Rao (eds). New Delhi: Academic Foundation. 2008. Pp 432. Rs 995.**

This is a rich collection of studies on development of Karnataka. Nine of the 25 contributors are academics located outside India, but having a keen interest in Karnataka's economy, polity and society. The book is an outcome of a conference held at the Institute for Social and Economic Change, Bangalore in 2005. The papers in the volume are grouped into three parts: Part I, Politics and Policy, contains four papers on political stability and change, political leadership and policies needed to promote empowerment of women. Part II deals with the themes relating to civil society and governance. It contains six papers focusing on NGO-state relations, public sphere, corruption and local governance, political economy of gram panchayats and dynamics of local governance, urban decentralisation and citizen participation. Part III, Sectoral Perspectives, presents six papers covering agrarian reforms, IT sector, social mobility and occupational health, gender and health inequities, participation in government programmes, social security for unorganised workers. The papers bear the stamp of scholarly approach and analysis of the themes they cover. The editors have contributed a perceptive overview bringing together the core findings and insights of these papers. They argue persuasively that the Karnataka experiences offer a viable model of development combining

technology-led growth with decentralisation. However, they themselves recognise that in terms of the evidence provided by the studies in the volume, this thesis is impressionistic and some could even regard it as wishful!

It is usual for new explorations in research to have an initial tentative phase. The strategy should be to press ahead scanning for clues the findings obtained so far. Sketched below briefly is the perspective obtained by the editors as reflected in the overview. The perspective leans markedly towards decentralisation and local governance with only a passing glance at growth. This is one reason for the tentativeness of their perspective, but more of it later. What is obvious from the studies is that the experiences in decentralisation themselves are mixed casting a shadow of ambiguity on future trends and prospects. The experiments to promote decentralisation began in the Mysore region of Karnataka over a century ago. In fact, "the terms Panchayat and Sabha were first articulated by Ram Raz, based on his experience as a 'native judge' in Mysore about 200 years ago. These were then adopted by the north Indian writers and subsequently absorbed into the nationalist canon via Gandhiji's vigorous advocacy" (Page 19). The evolution of PRIs in Mysore can be traced back to "Krishnaraj Wadiyar's expansion of local self-government in 1902-03". This culminated in "the 1983 Act under the Hegde government whose provisions were adopted, with a few modifications, by the authors of the 73rd Amendment to the Indian Constitution (in 1993)" (Page 19). A significant clue yielded by the studies is that despite these impressive moves at the top, the changes at the ground level were mixed with a significant part being negative, like corruption, weak participation, exclusion of disadvantaged groups and neglect of unorganised workers and of chronically backward areas which got included in the reorganised state of Karnataka in 1956. About the 'Karnataka Model' of development which they advocate for India as a whole, the editors are candid to admit that "The theory of the 'Karnataka Model' has far surpassed its implementation. Challenges that remain beyond regional inequalities, include the slow, incremental nature of change in many parts of the state, continuing gender inequalities, several shortcomings in the implementation of the PRI reforms, and a lack of attention to urban governance"(Page 20).

How does one explain this wide gap between the policies to promote decentralisation and the actual outcomes at the grassroots? The book does bring out the proximate factors for this gap, but we have a feeling that the basic cause is the alienation of the policy making elites, other organised groups and the development personnel from the rural masses. Governance continues to rely on top-down hierarchies and disinterested bureaucracy. However, improved transport and communications, mass media, changing life styles and markets are working to powerfully churn the rural society. The old order disintegrates while the policies and programmes to construct a new order based on decentralisation may be too late in coming. Meanwhile, the disaffected groups like Naxalites are likely to increase in

number and get linked up to become a formidable political threat to the present elite-dominated regime. An interesting possibility is that whether growth picks up or economy stagnates, the threat from disaffected groups is likely to loom larger and far more difficult to control than now. If growth picks up but excludes many in the absence of decentralisation, the disaffection would spread widely and become more virulent. If economy stagnates, the crisis can come even sooner than we now perceive! Our purpose is to suggest that if the Karnataka model sketched in the book is viewed from a broader economic and political perspective, the possible scenarios could range all the way from development to systemic breakdown. The moral is that the innovative interdisciplinary approach developed by the book needs to be extended to include growth in the economy beyond IT and politics of disaffection in the Karnataka model. The resulting model is not likely to yield an easy and quick path to development. But, it would give a fuller and deeper understanding of major processes of change operating in Karnataka and bring out more clearly and concretely what needs to be done to steer Karnataka towards the desired development goals. The book is an important milestone in the progress towards a Karnataka development model. But, in our view, a lot remains to be done. A careful reading of this book will provide valuable clues to the long and twisted path which remains to be covered to make the model a more reliable guide to policy making. The book can be considered as a major step taken in that direction.

Institute for Social and Economic Change   ***V M Rao***
Bangalore – 560 072.

***States of the Indian Economy: Towards a Larger Constituency for Second-Generation Economic Reforms*. Amir Ullah Khan and Harsh Vivek. New Delhi: Sage Publications. 2007. Pp 256. Rs 550.**

Amir Ullah Khan and Harsh Vivek, with educational training from the Institute of Rural Management, Anand, and with easy proximity to a large volume of data in Indian Development Foundation and National Sample Survey 58th Round, have brought out a very useful book on Indian economy, which could be used as a ready reckoner. The approach of the book is quite different from that of the other books on Indian economy. The language used is simple, clear and exact, making the reading enjoyable. The pictorial explanations deserve special appreciation. The font size and the style of printing make the reading easier.

The authors have attempted to give a balanced view on the patterns of development in India, touching upon the strength, weakness, opportunity and threats. The achievements in the last one-and-a-half decades in India have been beautifully traced and also praised. Historical perspectives and unambiguous definitions of some important concepts and analysis of the available data add to the

merits of the book. One can easily understand, by going through the book, the physical and policy environment of Indian economy. As a result, this book could be used by post-graduate students as a text-book on Indian economy and by researchers as a reference book.

The book consists of six chapters, besides introduction and conclusion. The growth story, importance of Union Budget, political economy of price rise and National Rural Employment Guarantee Programme (NREGP) are very briefly discussed in introduction. Here (Pp 28-29), taking some states as example, the inflation is attributed to the size of spending on NREGP, however, without substantial empirical evidence. Establishing such relationship could have been avoided, for it appears to suggest the suspension of NREGP for arresting the price rise.

The first chapter extols the growth of the Indian economy. The drivers of the growth identified in this chapter, however, are not the new ones, nor the results of the recent economic reforms. For instance, the human resource, workforce and the majority of the finest educational institutions listed out on Page 49 (Indian Institute of Technology, Indian Institute of Management, Indian Institute of Science, Indian Statistical Institute, Council of Scientific and Industrial Research, Indian Agricultural Research Institute, Indian Space Research Organisation, Defence Research and Development Organisation and Bhabha Automic Research Centre) are there with us for long. Similar is the case with the manufacturing units like Hero Cycles etc. (listed out on Pg 57). These institutions and units have been helping Indian economy in many ways for long and their contributions need not necessarily be associated with economic reforms.

The challenges that we face are also listed out. They are poverty, regional disparity, infrastructural bottlenecks, unemployment and military expenditure. The economic reforms could not do much as far as these challenges are concerned.

Services in rural India are discussed in Chapter Two. Information on the rural access to infrastructural facilities is made available (Source: NSS 58th Round) for all the major states in India, enabling easier interstate comparisons. Scores and gap indices for rural infrastructure are also available, the source of which is India Development Foundation. Besides other things, the inadequacy of vocational training and industrial training has been rightly identified to be the cause for non-availability of skilled manpower and gainful employment on one hand and the emergence of unorganised and informal sectors on the other (Pg 71). The authors pinpoint the plight of the poor in the country even today (Pg 72).

Haryana, Punjab, Gujarat, Maharashtra and Tamil Nadu have been ranked as progressive states. Andhra Pradesh, Karnataka, Kerala and West Bengal are described as emerging states. A large amount of relevant and useful information on these progressive and emerging states is presented in chapters three and four, respectively. But, it is unfortunate that the other poor states have been excluded from this analysis. The details of these excluded states (or BIMARU states, as the

authors call them on Page 112) could have been utilised for finding answers for some of the following pertinent questions: (a) Why are these resource-rich states lagging behind? (b) Why have the economic reforms not helped them come out of the pits? (c) Is the problem with the reform measures or with those states? (d) What kinds of reforms do they need? (e) When would they join the list of progressive states? The authors, with sufficient skill and proximity to the required information, could easily write another book on answering the above questions; and in this way, could help in designing special development policies for those states as well.

Also, a large volume of statistics has been used in these two chapters, which are very useful for researchers. But in one place, a discrepancy has cropped up. Table 3.11 (Pg 140) gives 28.57 per cent as urban population in Maharashtra, but in the text page (fifth line in the last paragraph of Page 141) this is stated to be 42 per cent. The exact reason for this difference is not known.

There is a separate chapter (five) on infrastructure growth and investment. Here, power, telecommunication and transportation sectors are discussed, again with amply rich materials. In the same chapter, rural drinking water mission, rural electrification mission, rural irrigation mission and rural housing mission are presented as sub-headings under the heading of 'Rural Reconstruction - Bharat Nirman'. The overall performance is praised, though drinking water, electricity and housing in villages are still not satisfactory. The sixth chapter is on Industrial Renaissance, wherein the position of Indian industries during colonial period and during the pre and post-reform periods is discussed. Again the information presented is excellent. However, the purpose and sequence of these two chapters are not very clear. If the authors wanted to give a general background of the Indian economy, they could have presented these materials in the initial chapters. A part of the fifth chapter, 'Rural Reconstruction', could have gone very well with the second chapter, 'Services in Rural India'. Hence, it appears that had these chapters (two, five and six) been better planned, arranged and presented, the quality of the book could have been still better.

The last chapter, 'Conclusion - The Unfinished Agenda', appears to be a mixture of the views of the authors. Here, they remember the issues so far neglected. In the authors' own words: "However, what is now required is a serious look at the areas that have been ignored. For inclusive growth that would reduce poverty, take economic growth to the smaller towns and villages…" (Pg 238). Had the authors started the book with this serious outlook, the book would have been entirely different. At the fag end of the book, they list out some hot issues like, rural tragedy (Pg 239), misuse of input subsidies (Pg 240), abuse of dominance (Pg 243), lawlessness (Pg 245) and increasing levels of pollution (Pg 245) among others. What about the role of economic reforms here? Rigorous analysis of these issues with empirical evidences could have made the book better.

Though in many places, the authors commend the competition among the states in giving subsidies to the (foreign) industrialists (Pg 247), the negative implications of the unhealthy competition among the states are forgotten. Another problem found with this kind of approach is to call incentive to farmers as subsidy and subsidy to industrialists as incentive. In the name of inclusive growth, by using the market mechanism, exclusion of local populace is taking place in India. Unfortunately, this has not attracted the attention of the authors. This results in a very uncomfortable situation, as C T Kurien writes in his review of the book entitled *A Journey in Time and Space,* edited by Raj Kapila and Uma Kapila.

The 'Acknowledgements' have also been recorded beautifully in the book under review. However, the words, "...even as she handles a rowdy son, a boisterous daughter and seven other jobs…" (Pg 18) in the 'Acknowledgements' could have been better avoided.

Eventually, the book makes it clear that the states which were already better off have got some development inputs from the reform measures, while the poor ones (BIMARU) continue to be excluded. There may be regional disparities within the developed states as well. Thus, the book provides scope to raise the following questions: Will this kind of lopsided and unbalanced development have trickle-down effect? Will it be sustainable? If the current reform measures adopted so far could not help the poor states and poor regions to improve their economic conditions, what kind of reforms should be adopted to develop those poor and excluded states?

On the whole, the book is a very useful contribution to the existing knowledge and is an updated version of the Indian economy.

Professor of Economics   **S Iyyampillai**
Bharathidasan University
Tiruchirapalli - 620 024.

Children in Agony: A Source Book. **Sibnath Deb**. **New Delhi: Concept Publishing Company. 2006. Pp 366. Rs 700.**

Child abuse is a state of emotional, physical, economic and sexual maltreatment meted out to a person below the age of eighteen and is a globally prevalent phenomenon. However, in India, as in many other countries, there has been no understanding of the extent, magnitude and trends of the problem. The growing complexities of life and the dramatic changes brought about by socio-economic transitions have played a major role in increasing the vulnerability of children to various and newer forms of abuse.

Child abuse has serious physical and psycho-social consequences which adversely affect the health and overall well-being of a child. According to WHO:

"Child abuse or maltreatment constitutes all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power." Thus child abuse is a violation of the basic human rights of a child and is an outcome of a set of inter-related familial, social, psychological and economic factors. The problem of child abuse and human rights violations are one of the most critical matters on the international human rights agenda. In the Indian context, acceptance of child rights as primary inviolable rights is fairly recent, as is the universal understanding of it.

The National Policy for Children, 1974, declared children to be a "supreme national asset". It pledged measures to secure and safeguard all their needs, declaring that this could be done by making wise use of available national resources. It is a sorry state of affairs that ten successive Five Year Plans in our country did not consider the importance of such a vital issue and not allocated adequate resources to meet the needs of children. An exercise on child budgeting carried out by the Ministry of Women and Child Development revealed that total expenditure on children in 2005-2006 in health, education, development and protection together amounted to a mere 3.86 per cent, rising to 4.91per cent in 2006-07. However, the share of resources for child protection was abysmally low at 0.034 per cent in 2005-06 and remained the same in 2006-07. Available resources have also not been utilised effectively for achieving outcomes for children. As a result, the status and condition of children have remained far from satisfactory. In the Indian context, harmful traditional practices like child marriage, caste system, discrimination against the girl child, child labour and Devadasi tradition impact negatively on children and increase their vulnerability to abuse and neglect. Lack of adequate nutrition, poor access to medical and educational facilities, migration from rural to urban areas add to rise in urban poverty, children on the streets and child beggars, all result in break down of families. Trafficking of children also continues to be a serious problem in India. The nature and scope of trafficking range from industrial and domestic labour, to forced early marriages and commercial sexual exploitation. Existing studies show that over 40 per cent of women sex workers enter into prostitution before the age of 18 years. Moreover, for children who have been trafficked and rescued, opportunities for rehabilitation remains scarce and reintegration process arduous. These increase the vulnerabilities of children and expose them to situations of abuse and exploitation.

In such a situation, where children are still not receiving the desired attention by the governments and the larger society, the book under review is certainly a timely publication as it raises the various important issues like family violence and its impact on the children, child abuse and neglect, child labour, child trafficking and prostitution, street children, and juvenile delinquency. Author has dealt with these issues separately at length in six chapters. All the issues that have

been included in the book are inter-related and have a direct link with poverty, lack of parental guidance and care, and family violence. While dealing with the selected issues, the author has very aptly presented the related issues of the problem like the definition, types, myths and facts, incidences and magnitude, causes and consequences of the specific problem. In every chapter, the author has also discussed the preventions and interventions that can be taken up in order to deal with the problem. All the issues dealt in the book have been looked at in a global situation which makes horizon of the book quite large. One very important thing that has been included in the book is the latest selective study findings, given at the end of the each chapter of the book. It provides access to the reader to the relevant and latest literature and debate on the issue to understand the magnitude of the problem in a more detailed and holistic manner. Going by the way the author has dealt with the various issues/problems, the book can create an environment wherein a discussion keeping the child in the centre may gain momentum. However, certain issues relating to the efforts being done in order to make the child secure have either been fully ignored/left out or dealt with only cursorily in the book. Several examples can be cited in support of this. But I would like to quote only one such effort from India: the Childline (1098). The Childline is a national, 24-hour, free, emergency telephone helpline and outreach service for children in need of care and protection. The Childline aims to reach out to the most marginalised children in the age group of 0-18 years and provide interventions of shelter, medical, repatriation, rescue, death related, sponsorship, emotional support and guidance. Such helplines for children are operational in about 120 countries of the world. A book that has been written to sensitise the larger society, irrespective of social strata, about the problems of the children and adolescents to create more child friendly environment, need to incorporate such efforts essentially. The author can consider such efforts to be included in the next edition of the book. While going through the book, one may miss a synthesis or summary of what has been presented in each chapter. The book would have been easier to read had the summary been given either at the end of each chapter or as a separate chapter. However, even in the present form, the book certainly provides a good reading and is of immense value for all those who have interest in the issues relating to the children world over.

Senior Fellow   **Sandeep Joshi**
MP Institute of Social Science Research
6 Bharatpuri Institutional Area
Ujjain – 456 010.

Interrogating Social Capital: The Indian Experience. **D Bhattacharyya, Niraja G Jayal, B N Mohapatra and Sudha Pai (eds). New Delhi: Sage Publications. 2004. Pp 335. Rs 695.**

Social capital as a concept has attained some notice in recent years, be it in the development discourses of multilateral donor agencies or in academic writings. It is used as an empirical framework to analyse several macro- and micro-level results of the performance of democratic institutions. The World Bank and other donor agencies have even made it a central part of their lending strategies for the developing countries. Seeing the growing importance of the concept, the authors in the present volume have taken a crucial step to examine the relationship between the concept of social capital and democracy in India. Social capital has been defined by many scholars but here the term is used in the way Robert Putnam has defined it. According to Putnam, social capital comprises "those features of social organization — such as trust, norms, networks — that can improve the efficiency of society by facilitating coordinated action". There are ten essays in the book by various authors, based on their research field work.

The first three essays discuss the role of social capital in relation to collective action occurring in rural-based community institutions such as panchayats. Sudha Pai's essay, *Social Capital, Panchayats and Grassroots Democracy: The Politics of Dalit Assertion in Two Districts of Uttar Pradesh*, examines the role of social capital in segmented societies, either as facilitator or inhibiter in the functioning of the democratic institutions. She finds that though the Dalits have succeeded in asserting themselves in the political arena, i.e., in panchayats, by collective action and networking, this has at the same time undermined the relation among the Dalit sub-castes. The awareness and politicisation of Chamars has separated them from other Dalits such as the Balmikis, thereby inhibiting the building up of a broad-based social capital which would enhance the functioning of local democratic institutions. The reason attributed by Pai is the unequal access to the gains of Land Reforms and Green Revolution leading to economic and political powers being unequally accessed. However, her conclusion on Dalit political assertion in Uttar Pradesh seems to have gone much further than what may have been justified by the factual situation in those villages.

Political activities have also been the context of Niraja Gopal Jayal's paper, *Democracy and Social Capital in Central Himalaya: A Tale of Two Villages,* on the rural hill society in the Himalayas. This paper presents a grim view of the impact of the panchayat system on social capital, and shows how, before the present panchayat system was introduced, local traditions were very strong with movements such as Chipko and Sarvodaya. People were conscious enough to formulate and implement rules regulating the use of natural resources and sanctions to avoid violations. With the introduction of the new panchayats, a drastic change has

occurred in the whole tradition. Factionalism and divisions within the community have resulted in the reduction of attributes of social capital like trust and cooperation. The 'Van Suraksha Samiti' slackened in its working after being linked to the panchayat. To Jayal, social capital is a genetic endowment, dynamic and changeable in character, and cannot be created.

A significant aspect of social capital discussed by Bishnu N Mohapatra in *Social Connectedness and the Fragility of Social Capital: A View from a Village in Orissa* is that even though Putnam asserts that as social capital increases there would be more cooperation and learning, leading to sustained collective action, this is not happening. The village had earlier exhibited participation in all spheres of community life, with separate committees to look after the public behaviour of the villagers, temple properties, etc. But with political activities intruding into the village sphere, there has been a depletion of cooperation and common action. The power relation has broken the communities. In India, creation of social capital is not easy. Mohapatra has discussed *sahi* committees at length, but he has not considered the possibility that they bear a passing semblance to traditional panchayats such as caste panchayats, especially if one notices the duties performed by them, such as protection of community solidarity and organising yearly festivals. Mohapatra also describes a *charisahi* committee which is more like traditional village panchayats and comprises members from all the four localities (localities inhabited by the 'touchable' castes; the fifth locality is of the Harijans, hence excluded). An important function of this committee is dispute settlement, just as traditional panchayats.

Susanne Hoeber Rudolf's essay *Is Civil Society the Answer?* makes an interesting assessment of the relation between social capital and associations, i.e., civil society institutions. She relates how the associations can be negative as well as positive for a society. Earlier studies had shown that external linkages in the form of state action and party-oriented activities have broken up local initiatives and organisations. It indicates that all associations need not be trust builders. Associations may have an effect on the 'inner moral life' of the participants, but it does not necessarily promote collective action. Social capital is not a unilinear progressive process, but can turn out to be regressive too.

Relating political action and civic acts, Dwaipayan Bhattacharyya discusses in his *Civic Community and its Margins: School Teachers in Rural West Bengal* the effect of political mobilisation of a school teacher on social capital in rural West Bengal. In the study, the school teacher was the link between the village and outside agencies, as he was educated. He was liked and respected by the villagers as he was responsible for their children's education. But with the entry of the Left parties, he was drawn into party work and neglected the social activities that he used to carry out. Due to this growing detachment, the respect that the village people had for the teacher went down, and he was also later discarded by

the party. There is an underlying tension present between political action and civic acts.

In continuation of the theme of the interplay between the school system and social capital, Manabi Majumdar's article, *Classes for Masses? Social Capital, Social Distance and the Quality of the Government School System*, examines the links between social inequalities and educational participation, emphasising the issues of civic cooperation, which is hampered amidst varying inequalities. The social distance (the gap between the social background of the teacher and students) has led to the teachers of 'higher' groups being apathetic towards the 'low' caste/class student which has resulted in the denial of proper teaching to the students. The elites send their children to private schools and, hence, are least bothered about improving the functioning of the government schools. The author asks for a common norm to consider the cause of the deprived children, breaking the ties of patron-client for some time and restore norms of reciprocity to fix the lapses in the government school system.

Nandini Sundar's essay, *Devolution, Joint Forest Management and the Transformation of Social Capital,* discusses the joint forest management (JFM) policy in relation to social capital and devolution. This region of Bastar in Madhya Pradesh had high levels of social capital that led to collective management of natural resources by the Scheduled Tribes. But with the introduction of the government-initiated JFM, this capital is lacking, and has not been transferred to the formal system. The committees have forced the limited formal structure to carrying out illegal activities, and have thus destroyed the existing social capital.

The next two studies deal with the measurement of social capital in Indian states. Peter Mayer in *Making Democracy Perform: Human Development and Civic Community in India* emphasises human capital, rather than social capital, as the builder of civic communities, with education as an important process. He takes the example of Kerala where with the early provision of education better civic communities were built. He agrees with the applicability of Putnam's version of social capital in India but criticises his lack of emphasis on the role of education. Renata Serra, however, finds it difficult to measure social capital in India, more so because of the greater complexity of societal features. In her article, *Putnam in India: Is Social Capital a Meaningful and Measurable Concept at the Indian State Level?,* she finds the civic community variables of Putnam (i.e., newspaper readership, membership in voluntary associations) difficult to be located in Indian states. Single indicators cannot reflect the diversity of India. Hence she advocates the use of an intervening variable such as education which could build trust, participation etc., and emphasises universal education to build social capital.

Ashok Swain's essay, *Social Network and Protest Movements: The Case of Kerala*, explores the usefulness of social capital to develop protest movements. Strong social networks and connectedness strengthen and bring success to protest

movements. These movements are sustained through loose ties but reach wider groups, such as mass movements which took place after Independence against socio-economic oppression and 'anti-people' government policies. Swain finds the liberty to organise and mobilise protests guaranteed to its citizens in Indian democracy as suitable for protest movements.

The lucid language in which the essays are written and the supporting tables and figures make the book interesting to read. There is a free and continuous flow of issues and thoughts in the book. The field-based critique of the theory of social capital in an Indian (non-Western) setting is the most appealing feature of the book. The only problem is the repeated explanation of the concept of social capital in every chapter, which one feels is certainly not required. The book deals with a subject that is so relevant to development, and looks at an attribute that may contribute to the greater effectiveness of development programmes and anti-poverty efforts.

Researcher   **Priya Gupta**
Institute for Social and Economic Change
Bangalore - 560 072.

Books at a Glance

The Whole Truth and Nothing but the Truth: A Dalit's Life.
**Kesharshivam B. Translated from Gujarati novel *Prrnasatya*, by
Gita Chaudhuri, Kolkata: Samya. 2008. Pp xxxii+307. Rs 350.**

Gujarat, the birthplace of Mahatma Gandhi, is as well the region where he
tried to cultivate the seeds of non-violence, non-discrimination and equality. In
hindsight, it seems that the Mahatma had not fully understood the nuances of the
culture there. This novel, a translation from the Gujarati original, is an attempt to
help the English readers hear the voices of the subaltern from Gujarat as depicted
by the life of a member of the deprived community. Literary works by Dalit writers
have emerged significantly in Maharashtra and Dalit literature has carved out a
niche for itself in Marathi literary world. Unlike in Maharashtra, Dalit literature in
Gujarat did not emerge from politically strong moorings. Initially, it was sporadic,
but slowly grew to be a full-fledged literary group. Largely it is a truthful depiction
of the sufferings and struggles experienced by the members of this marginalised
section of society. Basically it comprises autobiographies of individuals who have
suffered untold misery and discrimination during their lifetime. On the one hand,
this literature serves the purpose of understanding the social equations, and hence
social intervention; on the other, it voices the subdued militancy. *The Whole Truth…*
is the life story of Kesharshivam, a state government officer, who was born in a Dalit
family and grew up under the pressure of continuous struggle. He actually began
his career as a short story writer, and therefore, his style of narration, quite luscious
as it is, enhances the readability of the novel. He develops characters quite naturally
and describes events very cogently. The social lives of Dalits (specifically in Gujarat)
are meticulously recorded, and even seemingly insignificant events are described
in all finer details. Dr Ambedkar's influence pervades the entire novel, more so in the
Introduction by the translator. She writes: "If you were to knock on the words of
pain, you would hear the sound of truth…. if you were to dig into them, you would
find blood streaking out". Kesharshivam brings in Gandhi's simplicity in his
narration. The narration at times has a strong Hindu cultural bias and one would not
miss the lengthy description of the strong cultural ethos. Usually a translator's own
life, experiences and thinking pose a problem in describing and palpably depicting
the feelings of the original author; but Gita Choudhury proves that it is certainly not
impossible. Her powerful presentation shows her in-depth understanding of the
subject without personally undergoing the suffering that the original author has
undergone. She writes: "Birth means entry into life. But for the Dalits, it is an entry
into a forest…. these forests are full of wild animals, which kill at a blow. They often
eat what they kill so that there is no bother of burial.... the forests are not uniform,

there are several sanctuaries, where these wild animals are sheltered: social sanctuaries, religious sanctuaries and spiritual sanctuaries." This book provides a vantage window to view the life of Dalits from Gujarat (the land of Mahatma) during those eventful five decades after Independence. If one has any compassion for understanding (and even experiencing) the social trauma, one must read this book.

Her Story, Our Story and On the Swing: Short Stories and a Novella. **Vibhavari Shirurkar. Translated from Marathi by Yashodhara Deshpande Maitra. Kolkata: Stree. 2008. Pp xxxvi+230. Rs 275.**

Publishing house Stree has been doing a yeoman service in the filed of gender studies by bringing out in English important writings by women from different regions of India. K*alyanche Nishwas* (Breathing of the Flower Buds) and *Hindolyawar* (On the Swing) is a collection of short stories and a novella in Marathi by Malati Bedekar under the pseudonym Vibhavari Shirurkar. Strong feminist movements have taken place in the Pune region giving rise to a good number of authors who reflected upon the problems and sufferings of women. The region has witnessed a public movement in family planning led by women. It also has the tradition of setting up schools for women: the first school for women was started by Savitribai and Jyotiba Phule. Maharshi Karve's Stree Shikshan Sanstha took roots in Pune and not only educated a large number of women but also created a strong group of feminist activists. But for the efforts of these groups, feminism in Maharashtra would not have flourished to the present extent. The publishers and the translator ought to be complimented on bringing out this beautiful collection of short stories that cover many facets of suffering by women. These are not just stories but case studies that educate all of us about the many issues confronting and agitating the mind of a woman. It begins with the story of sacrifice of a young girl who decides not to marry to support her parents. There is this story about a married woman whose inability to express her love for her friend from her young days suffocates her. The inexplicable pangs of this suffocation touch the readers through the translator's powerful descriptions. There are these whispers of gossipers poking fun at the innocent girls that are throttled by the society's selfish unwritten rules. Another piece, *My Mother, My Enemy*, describes the silent suffering of a mother and her daughter. Both are taunted and targeted by the society and suffer its hurting darts and endure the sad and slow garroting feeling. Maybe today's woman here is fearless and less suffering, but then there may be a lot below the surface that cannot be fathomed from a distance. Pain and suffering is also determined by the class and place in the society. The issues confronting a woman in a well-to-do family may be different in content, but the core probably is the same: the smothering of human emotions. The novella occupies another half of the canvass presented to the reader painted in a pleasant and yet painful colour. It again

underscores the translator's full understanding of and identification with the original text. It reverberates the deep feeling a female has in her heart that seldom reaches her lips. The book mirrors how the life of a woman is centred around social considerations, oppressions and interfaces. Women's position places them always at the receiving end and they live on as mute spectators. Surely, the stories were written during the pre-Independence era but the inner, core feminine exploitation has not changed since. What has changed is only the context and locations. The translator's narration is lucid and piercing and retains truthfully the feelings of the original author. The powerful narration helps one understand a woman from within. And it stirs up any sensitive soul, be it a man or a woman.

Administrative Management in Education. **Sitra Sarojini. Bangalore: Sun Publishing House. 2003. Pp 280. Rs 225.**

— Dr M D Usha Devi, ISEC, Bangalore.

At a time when the education system across the world is expanding in its structure and forms of delivery, it is most appropriate that administration and management of education are emerging as important topics of discussion and debates in the education discourse. Hence the subject of this book is extremely important. However, the way this theme has been dealt with by the author and the way it has been published in the form of book are not only highly unprofessional but also lack seriousness on the part of the author and the publisher.

The book has two parts. While Part I consists of seven chapters, Part II has 12, and the 19 chapters are intended to cover a wide spectrum of administration and management dimensions. Each chapter, however, is a mere compilation of concepts and facts gathered from different sources, many of which do not find a place in the list of references. The author seems to be unclear about what is to be presented in the chapters and how it is to be presented, and, above all, what is the purpose of the presentation. Each chapter begins without any introduction and ends abruptly.

Regretfully, the publisher appears to have no idea of publishing a book and what should be the format in which a book has to be published. The bibliography is in the beginning itself, immediately after the foreword and preface! The year of publication of the book is not mentioned anywhere, compelling the reader to make wild guess about the same by looking at the dates mentioned in the preface and foreword. The book is not edited for language and typographic errors, as they abound freely throughout the book.

As such, the book does not make any significant contribution to the literature nor can it serve as a useful reference for students of education.

CONTENTS

CONTENTS

Subscription Rates

CONTENTS

CONTENTS

SUBSCRIPTION FORM

For subscribers in India, Other Developing Countries and Rest of the World

I/we would like to subscribe to *Journal of Social and Economic Development* and my payment instructions are given below.

Name: _____

Company/Institution:_____

Address: _____

_____

City: _____ State/Province: _____

Zip/Postal Code:_____

Country: _____ e-mail: _____

Subscription Total: | US$ | | Rs. |

Method of Payment

❑ Cheque/DD enclosed (Outstation cheques are not accepted).
   Cheques/DDs should be in favour of **The Registrar, Institute for Social and Economic Change, Bangalore - 560 072.**

❑ Bill me. (Phone Number required)

	Five Years		Single Issues	
	Institutions	Individuals	Institutions	Individuals
SAARC Countries	❑ Rs.1000	❑ Rs.600	❑ Rs.150	❑ Rs.120
Rest of the World	❑ US$250	❑ US$125	❑ US$25	❑ US$25

Phone: _____   Signature: _____

Send your order to the Publications Office:

ISEC
Publications Office
Institute for Social and Economic Change
Dr. V K R V Rao Avenue, Nagarabhavi PO
BANGALORE - 560 072.
Tel: 91-80-23215468   **Fax:** 91-80-23217008
Email: publications@isec.ac.in **Website:** www.isec.ac.in

Guidelines for Contributors

- Only articles/research notes/book reviews not published and not under review for publication elsewhere should be sent; a declaration to this effect should accompany the manuscript.

- Manuscripts should be submitted in duplicate, in a maximum of 30 pages (of A-4 size), typed double-spaced in 12-point font (Times New Roman); 15 pages of similar specifications for research notes. These limits are inclusive of tables, figures and references. Once an article is accepted, the author is required to provide the final version both in hard copy and on a floppy disk (3.5") prepared in MS Word.

- Manuscripts should be accompanied by an abstract of less than 150 words. Illustrations, figures, maps, graphs, etc., should be submitted on separate sheets, and should be kept to the minimum.

- Single quotes should be used for all quotations; double quotes only within single quotes. Non-English words should be underlined or in italics; spellings of such terms should be consistent in the article.

- All notes should be numbered consecutively and appear as end notes; notes for tables should be marked with (*), @, #, etc., and should appear at the bottom of the table. Sources of data, if from other than one's own research, should be listed below each table.

- References should follow the author-date system, e.g., Rao (1974:78) or (Rao 1974:78). The list of references should be in alphabetical order, multiple references to the same author for the same date should be distinguished by suffixing a, b, c, etc., to the date. (e.g., Rao 1974a:78; 1974b:106–7). The style of referencing should be as follows:

Beteille, Andre (1996). Sociology and Common Sense. *Economic and Political Weekly,* XXXI (35–7):2361–5.

Govil, Kailash Chandra (1991). *Why Do Farmers Plant Trees? — A Temporal and Spatial Analysis for Uttar Pradesh, India*. A Ph.D. Dissertation, Berkeley: University of California. Unpublished.

Rao, V. K. R. V. (1983). *India's National Income 1950–1980.* New Delhi: Sage.

Srinivas, M. N. (ed) (1996). *Caste — Its Twentieth Century Avatar.* New Delhi: Viking, Penguin India.

- Authors should ensure that References have all the necessary details and are accurate in respect of the spellings of authors, volume and issue number of journals and page numbers cited.

- Material should be arranged under appropriate sub-headings and not section numbers.