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July 24, 1996

To: Members of the Executive Board

From: The Secretary

Subject: **Bangladesh - Selected Issues**

This paper provides further background information to the staff report on the 1995 Article IV consultation discussions with Bangladesh, which was circulated as SM/96/54 on March 1, 1996 and is tentatively scheduled for discussion on Wednesday, August 28, 1996.

Ms. Bassett (ext. 34621) is available to answer technical or factual questions relating to this paper prior to the Board discussion.

Unless the Documents Preparation Section (ext. 36760) is otherwise notified, the document will be transmitted, in accordance with the procedures approved by the Executive Board and with the appropriate deletions, to the Asian Development Bank (AsDB), the Food and Agriculture Organization (FAO), the Islamic Development Bank (IsDB), the United Nations Development Programme (UNDP), the World Food Programme (WFP), and the WTO Secretariat, following its consideration by the Executive Board.

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INTERNATIONAL MONETARY FUND

BANGLADESH

Selected Issues

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Approved by Southeast Asia and Pacific Department

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A. Introduction

Despite progress in some social areas, poverty in Bangladesh still afflicts over 50 million people. Poverty in Bangladesh has many facets, including low income, inadequate calorie intake, poor health and educational attainment, and limited access to social services. This short note is organized in six sections: the second section reviews the recent trends in social indicators; the third section discusses definitions and the measurement of poverty; the fourth section relates poverty to growth scenarios; the fifth section reviews poverty alleviation programs; and the sixth section highlights the Government's strategies to reduce poverty.

B. Trends in Social Indicators

Many key social indicators have been improving during recent years. Population growth, malnutrition, and mortality rates declined, while life expectancy, child immunization, contraceptive prevalence, literacy, access to safe drinking water and sanitation improved. Data released recently by the Bangladesh Bureau of Statistics (BBS) indicate that between 1990 and 1994, life expectancy at birth increased from 56 years to 58 years; the infant mortality rate per 1,000 live births declined from 94 to 77; the under-five mortality rate per 1,000 live births declined from 151 to 134; child immunization rose from 59 percent to 71 percent; the contraceptive prevalence rate increased from 38 percent to 45 percent; access to safe drinking water increased from 89 percent to 97 percent; access to sanitation increased from 21 percent to 34 percent; and adult literacy improved from 37 percent to 42 percent.

Nonetheless, based on international standards of protein-energy nutrition, only 6 percent of the country's under-five children can be considered normal; the rest are either underweight and/or stunted. The prevalence of parasitic infection in children under-five is frequently over 85 percent. Moreover, most key social indicators still compare unfavorably with those of other countries. According to United Nations Development Program (UNDP) classifications, Bangladesh ranks 146 out of 173 countries in terms of human development as a result of poor health, widespread illiteracy, and low income. Life expectancy at birth is below the average of 63 years in developing countries; the infant mortality rate per 1,000 live births is higher than the average of 69 on average in developing countries; the adult literacy rate is less than the average of 69 percent; and the maternal mortality ratio of 459 per 100,000 live births is one of the highest in the world. Moreover, in terms of GDP per capita, only eleven countries rank lower than Bangladesh.

Rapid population growth (currently about 2 percent), relatively slow economic growth (a trend rate of about 4 percent), and rising inequalities are the principal impediments to

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[1]Prepared by Jan Bové, Resident Representative in Dhaka based on work by Min Tang (AsDB) and World Bank staff.

poverty reduction. Bangladesh is the most densely populated non-city state in the world and the land area is depleting fast in per capita terms. Cropped land per capita declined by 33 percent during 1975-92. Close to 60 percent of rural households are landless. Despite notable increases in foodgrain production over the past decade, the national foodgrain balance remains precarious. Natural disaster--floods, cyclones, and droughts--strike the country frequently, causing further serious hardship to the vulnerable population. The population growth has also over-stretched the basic social services and aggravated environmental problems. The rapid urban population growth (6 percent annually) is posing new challenges.

There are large disparities among the urban and rural populations, and between men and women. Whereas the urban mean real consumption was 24 percent higher than the rural value in 1983/84, the discrepancy rose to 40 percent in 1991/92 (Ravallion and Sen, 1995). Also, the burden of social deprivation falls disproportionately on women: 88 percent of the female labor force falls into poor category compared to 76 percent for men; the adult literacy rate for women is about half that of men; the primary school enrollment rate for girls is lower than for boys and their drop-out rate is higher; the average wage rate for women is less than half that for men.

C. Poverty: Definitions and Measurement

There is no single agreed definition, nor is there a commonly accepted measure of poverty. Whereas the Government rightly points out that poverty, as a phenomenon, is complex in nature, it has chosen to define a poverty line in terms of a minimum caloric consumption of 2,122 calories per person per day (1,805 calories for the "hard-core" poor) (MOF, October 1995). Grameen Bank uses an alternative concept of poverty based on 10 indicators of well being, including, for example, school attendance, capacity to repay small loans, capacity to access medical care, and access to a minimum standard of housing. Recent research has focused on a monetary poverty line, putting a taka value on a "basic-needs consumption bundle" representing a minimum daily intake of calories (2,122) and protein (58 grams), plus a nonfood component (Ravallion and Sen, 1995).

The principal source of information on poverty consists of household consumption expenditure data from the periodic Household Expenditure Surveys (HES) conducted by the BBS. Table 1 shows the official poverty indicators based on the HES conducted from 1983/84 to 1991/92.

According to these official data, the proportion of people below the poverty line as a percent of the total population declined from 58 percent in 1983/84 to 47 percent in 1991/92. The proportion of "hard-core" poor declined from 38 percent in 1983/84 to 28 percent in 1991/92. However, the Gini coefficient increased from 0.36 in 1983/84 to 0.39 in 1991/92, suggesting increasing inequalities over this period. An analysis of these data leads to three broad conclusions: (i) the poverty incidence declined moderately in the 1980s, but improvements became very small by 1991/92; (ii) the percentage of poverty in urban areas is more or less equal to rural poverty, whereas the incidence of hard-core poverty is much higher

Table 1. Bangladesh: Official Poverty Indicators, 1983/84-1991/92

	1983/84	1985/86	1988/89	1991/92
Poverty incidence: percent of population with daily calorie intake per person below				
2,122 calories				
Rural	56.97	51.04	47.80	47.61
Urban	66.36	56.00	47.73	46.58
National	58.05	51.66	47.79	47.47
1,805 calories				
Rural	37.94	22.06	29.52	28.27
Urban	35.51	19.20	20.45	26.03
National	37.66	21.70	28.37	27.97
Millions of people with daily calorie intake per person below				
2,122 calories				
Rural	47.0	44.2	43.4	44.8
Urban	7.1	7.0	6.3	6.8
National	54.1	51.2	49.7	51.6
1,805 calories				
Rural	31.3	19.1	26.8	26.6
Urban	3.8	2.4	2.7	3.8
National	35.1	21.5	29.5	30.4
Gini coefficient				
Rural	0.35	0.36	0.37	0.36
Urban	0.37	0.37	0.38	0.40
National	0.36	0.37	0.38	0.39

Source: Bangladesh Bureau of Statistics.

in rural areas; and (iii) the income distribution worsened between the mid-1980s and 1991/92. With the exception of the "hard-core" urban poor, these data also suggest that there was a decline in the absolute number of poor people during the nine-year period ending in 1991/92.

The official data on poverty incidence derived from HES data have been questioned by several studies, mainly because of measurement problems and shortcomings in sample coverage. As noted above, an alternative indicator using data on poverty incidence based on the monetary value of a bundle of basic-needs goods has been calculated (Table 2). It suggests that, following a decline until the mid-1980s, the incidence of poverty at the national level increased again to 50 percent of the population by 1991/92. These data also confirm that the incidence of rural poverty is consistently higher than urban poverty.

Table 2. Bangladesh: Alternate Poverty Indicators, 1983/84-1991/92[1]

(Percent of population)

	Urban	Rural	National
1983/84	40.9	53.8	52.3
1985/86	30.8	45.9	43.9
1988/89	35.9	49.7	47.8
1991/92	33.6	52.9	49.7

Source: Ravallion and Sen, 1995.
[1]Based on the monetary value of a bundle of basic-needs goods.

The Bangladesh Institute of Development Studies (BIDS), on the other hand, offers an alternative to the HES data base, with data on rural poverty from a 62-village survey conducted in the late 1980s and again in 1995 (BIDS, 1995). These data also provide a measure of poverty in terms of the monetary value of a bundle of basic-needs goods (i.e., the same methodology used for Table 2). Although the proportion of households below the poverty line declined from 57 percent in 1989 to 48 percent in 1994, these data show that the intensity of poverty as measured by the average gap of income of poor households from the poverty line, remained virtually unchanged at 22 percent. Also the Gini ratio increased marginally from 0.45 in 1989 to 0.46 in 1994, supporting the official data for the earlier part of this period that indicated a deterioration in income distribution.

Evidence for the 62-village study that the incidence of poverty had declined in the early 1990s is contradicted by recent (limited) surveys conducted by the Helen Keller international organization, which show that per capita average grain intake per week during April 1992 to April 1995 declined from 3,259 grams to 3,206 grams for the vulnerable rural population and from 2,621 grams to 2,568 grams for urban slum households. The apparent deterioration may be due to an 18 percent increase in rice prices over this period. These surveys also suggest that health indicators deteriorated in the three-year period to April 1995.

A number of efforts are under way to improve the institutional capabilities and methodologies in monitoring poverty. The Fund, World Bank, and Asian Development Bank (AsDB) are providing technical assistance to the BBS to improve the HES; another AsDB technical assistance project focuses on monitoring urban poverty; and the Center for Integrated Rural Development for Asia and the Pacific (CIRDAP) is providing assistance to the BBS and the Planning Commission to regularly collect data on various aspects of poverty.

D. Poverty and Growth Scenarios

Although policies to redistribute income are necessary to help the poor, given the very low level of per capita income in Bangladesh, any significant improvement in the poverty situation will require an acceleration of economic growth. At the current population growth rate of 2 percent and static income distribution, the national income will need to grow by 3 percent annually just to prevent an increase in the number of poor. However, the recent pattern of increasing inequality in both rural and urban areas suggests that national income needs to increase by 5 percent per year to prevent an increase in the number of poor. Bangladesh, therefore, probably needs a real GDP growth rate of at least 7 percent, compared to the current trend of 4-5 percent, in order to achieve a major breakthrough in poverty reduction. To achieve this, investment will, however, need to increase to a range of 20-25 percent of GDP by early next decade from the current level of only 15 percent of GDP.

As mentioned above, the distributive pattern of growth is also important in tackling poverty. If not for the evidence of increasing inequality in the preceding decade, the urban and rural poverty rates would have been 10 percent and 3 percent lower, respectively, than the actual rates in 1991/92 (Ravallion and Sen, 1995). Not surprisingly, poverty is closely (but inversely) correlated with land ownership. A recent study indicates that only 6 percent of rural households who owned less than 0.04 acres of land had access to sanitation, while 28 percent of rural households who owned more than 5 acres of land had access to sanitation (MOF, June 1995). Such inequality is also reflected in rates of morbidity (167 per 1,000 who owned less than 0.04 acres, compared with 147 who owned more than 5 acres). Similarly, primary school enrollment was 65 percent for those who owned less than 0.04 acres, compared to 81 percent for those owning over 5 acres. Recent surveys also indicate that rural poverty is closely correlated with infrastructure development. In villages without irrigation, the hard-core poor were 32 percent of the population, whereas in villages with irrigation they

were only 16 percent; rural electrification reduced the proportion of hard-core poor from 31 percent to 14 percent; and good transport reduced the proportion of hard-core poor from 30 percent to 21 percent.

E. Poverty Alleviation Programs

There are several targeted programs for poor and vulnerable groups that are designed to generate employment through credit and social mobilization schemes. At present, there are some 900 nongovernmental organizations (NGOs) who are working with or alongside the Government to improve the socio-economic conditions of the poor. Foreign donors are making substantial contributions to the poverty alleviation effort.

The Government maintains a permanent safety net program, financed from the recurrent and ADP budgets consisting mainly of the Food for Works Program (FFW), the Rural Maintenance Program (RMP) and the Vulnerable Group Development (VGD) Scheme. During 1993/94 and 1994/95, the FFW provided employment to 1.2 million and 1.5 million laborers, respectively. The RMP provides employment to some 60,000 destitute rural women. During 1989/90-1994/95, some 1.8 million poor women received training in occupational skills, while accumulating seed capital for economic activities, under the VGD scheme. The Food for Education Program is a recent innovation that is designed to reduce the number of school drop-outs while providing a safety net for poor households.

Both the Government and the NGOs (often working together), have developed several micro-credit programs, which focus on income generation and skill development for the poor. The Bangladesh Rural Development Board (BRDB), the largest government organization involved in poverty alleviation through micro-credits, has been working with 350,000 families and has disbursed Tk 4.77 billion in total. The Palli Karma Shahayak Foundation (PKSF), which works closely with NGO partner organizations, has disbursed Tk 480 million among 217,000 borrowers. Grameen Bank now has a membership of 1.2 million and covers almost half the villages in the country; it has disbursed well over Tk 40 billion in micro-credits. Similarly, Bangladesh Rural Advancement Committee (BRAC) now has a membership of 1 million in 2,500 villages; it has disbursed nearly Tk 6 billion in micro-credits.

Each of these programs is generally considered to have had a considerable impact on rural incomes, educational opportunities, advancement of women, and employment of the poor. A recent study indicated that the incidence of hard-core poverty was lower among participants of major NGOs (Khandker and Chowdhury, 1995). In Grameen Bank villages, incidence of hard-core poverty was 10 percent for participants as against 17 percent for nonparticipants; in BRAC villages, this ratio was 14 percent for participants, compared to 16 percent for nonparticipants; in BRDB villages, the ratio was 10 percent for participants as against 22 percent for nonparticipants. Grameen Bank estimates that, based on its own definition of poverty (see above), some 60 percent of its members crossed the poverty line in the past ten years.

The overall objective of lending programs of major donors including the World Bank and the AsDB in Bangladesh is to reduce poverty in a sustainable way. The World Bank assists the Government's efforts to reduce poverty by accelerating export-led private sector growth, and by promoting human resource development through better access and improved quality of basic education and primary health and family planning services. The AsDB's operational strategy focuses on the creation of economic opportunities for the poor and improving their access to basic social services. Both provide extensive concessional funding to many sectors, including agriculture, rural development, infrastructure development, population control, health and education.

F. Government Strategies to Reduce Poverty

The alleviation of poverty is the focus of the Government's development agenda. The medium- to long-term strategy is to eliminate structural impediments to poverty reduction. This, it is recognized, will require an acceleration of economic growth and the maintenance of macroeconomic stability. The Government has emphasized, however, that economic growth, while essential, is not a sufficient condition to eradicate poverty.

The development objectives of the draft Participatory Perspective Plan (PPP) of Bangladesh for 1995-2010, prepared in 1995, were: poverty reduction; generation of productive employment opportunities; the attainment of self-sufficiency in foodgrain production; human development; and private sector development. The principal strategies to achieve these objectives were: generation of labor-intensive growth; promotion of sustained investments in social and physical infrastructure; stimulation of private investment; and outward-looking economic policies. In this connection, the PPP underscored the need for developing appropriate structures for poverty alleviation programs, expanding food-assisted targeted programs, enhancing NGO participation, developing urban poverty programs, and promoting local level participation in poverty programs. The emphasis on poverty was not unique to the PPP, as previous plans also identified poverty reduction as one of the major objectives. To achieve the projected GDP growth rate of 8 percent by 2000 and 10 percent by 2010, investment was envisaged to increase to 20 percent of GDP by 2000 and 23 percent of GDP by 2010. Substantially higher resource allocations have been proposed for key social sectors namely education, health, and population sectors. Even on these optimistic assumptions, however, which would require substantial acceleration of structural reform, the eradication of poverty would take much longer to achieve than the PPP's target in the first ten years of the next century.

II. Recent Developments and Prospects of Agriculture Sector in Bangladesh[2]

A. Introduction

The agriculture sector in Bangladesh has achieved significant progress over the past decade. Technical and structural changes in this sector led to a rise in total foodgrain production from 16.2 million tons in 1985/86 to 19.6 million tons in 1992/93. As a result, the food deficit was reduced and the country reached near self-sufficiency in rice in years of normal weather. Assuming that the trend of the past decade continues, the country would be able to achieve self-sufficiency by the year 2000.

Continued policy reforms in the agriculture sector contributed largely to this impressive growth in foodgrain production. Deregulation and liberalization policies include increase in farmers' access to improved technology such as the use of high-yielding varieties (HYVs) and other modern bio-chemical technology; elimination of the state monopoly in the distribution and import of fertilizer and decontrol of power; deregulation of private sector imports and distribution of minor irrigation equipment and partial deregulation of seed distribution activities; deregulation of tubewell siting adopted for the use of water resources; and lower tariffs on imported farm equipment.

Despite these achievements, foodgrain production dropped substantially during 1993/94-1994/95. While this recent setback was partly attributed to unfavorable weather conditions, structural bottlenecks and inappropriate government intervention were also responsible. Looking ahead, agriculture will continue to be a vital factor in economic growth and in the improvement of the quality of life of the population. The floods in most areas of northwestern Bangladesh dampened the hope for bumper crop in 1995/96. Provided weather conditions are normal, a rebound in the rate of growth of foodgrain output is expected in 1996/97. The medium-term outlook for the agriculture sector largely depends on the degree of success of Government policies in providing quality infrastructure and public service; strengthening the development and spread of improved technologies, including those for crop diversification; and energizing private sector involvement. This latter aspect will require continuing progress in liberalizing the provision of inputs (particularly seeds) and resisting pressures to backslide on liberalization.

B. Structural Changes in the Agriculture Sector

1. Output growth

Value added in agriculture, which contributed over one-third of GDP and two-thirds of total employment, grew at an average rate of 2.3 percent during the 1982/83 to 1993/94 period. Foodcrops, which are dominated by rice, accounted for about 77 percent of value

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[2]Prepared by Min Tang (AsDB).

added in the agriculture sector and about 27 percent of GDP. The average growth in foodgrain production was 2.7 percent during the period 1989/90 to 1993/94, higher than the average population growth of about 2 percent during the same period. This growth enabled the country to reach near self-sufficiency in rice production in years of normal weather, a phenomenon which was considered impossible twenty years ago. Accordingly, food imports fell substantially from 3 million tons in 1988/89 to 0.65 million tons in 1993/94.

Performance of other crops, however, was generally stagnant.[3] Production of oilseeds and pulse hovered around 0.45 million tons and 0.5 million tons for over the past decade. Production of jute, which is the main cash and export crop, fell from 5.3 million tons in 1990/91 to 4.5 million tons in 1993/94 as a result of weak demand in the domestic and international markets. Fruit production was also at a standstill for almost a decade. The only major exception was cotton production which increased more than three-fold since 1988/89. There was also a big jump in the production of vegetables in 1993/94.

2. Policy changes

The performance of foodcrops can be largely attributed to the improvement in the agriculture policy environment, elimination of state monopoly in supply of most inputs, deregulation of tubewell siting, and the expanded use of HYVs.

The fertilizer market was privatized and deregulated over the last few years. The distribution of fertilizer, which used to be a monopoly of the public sector, is now largely in the hands of the private sector. The shift in the distribution from public to private sector, which consisted of a network of 123,000 distributors, dealers and retailers, resulted in a sharp fall in fertilizer prices and relieved the Government of enormous handling and transportation costs. In 1991, private traders began to engage in the direct import of fertilizers. It was estimated that the share of the private sector in the fertilizer market increased from less than 5 percent to more than 60 percent during the 1986/87-1991/92 period. The supply situation also improved substantially. During 1988/90-1993/94, the availability of fertilizers to the farmers increased from 1.5 million tons to 2.1 million tons. Bangladesh became self-sufficient in urea and often had surplus for export. However, since factories were still under the public sector, pricing decisions were frequently subject to political intervention.

The private sector also actively participated in the market for irrigation equipment. Since the late 1980s, the Government has withdrawn all restrictions on the import of irrigation equipment by the private sector and eliminated import duty on agricultural machinery. The removal of restrictions on standardization of the irrigation equipment aided farmers in selecting cheaper sources of equipment. Irrigation equipment ownership and management was shifted from the public to private sector. Government subsidies on minor irrigation

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[3]Data on nongrain crops in Bangladesh is poor, so that there may in fact have been more growth than reported.

equipment were also eliminated. As a result, the use of tubewell irrigation rose significantly. In an effort to standardize import duties, duties on some agricultural equipment have been reintroduced, and such equipment has also become subject to the VAT.

Policies on seeds played an important role in foodcrop sector development. The share of HYV rice in total acreage increased from 15 percent in the 1970s to 30 percent in the 1980s. This share rose further to almost half of total acreage in the early 1990s. Consequently, the contribution of HYV rice in total rice production more than doubled from about 30 percent during the 1970s to 65 percent in the early 1990s. However, compared with neighboring countries, the use of quality seeds remains low in Bangladesh. Inadequate supply of improved seeds is one of the principal causes of the low yields in rice and other crops in the country. For a long time, seed development and distribution were mainly under public sector control. In 1992, a new seeds policy was announced to facilitate private sector involvement in the seed distribution and to phase out government seed retail centers. However, this did not apply to rice, wheat, potatoes, jute, and sugarcane. Moreover, this seed policy has not become regulation, leading to uncertainties of its permanence, which inhibits private sector's willingness to invest.

C. Recent Developments in the Agricultural Sector

While foodcrop production increased steadily in the last decade, it suffered some setbacks during the past two years. Foodgrain production declined by 1.8 percent from 19.5 million tons in 1992/93 to 19.2 million tons in 1993/94, the first contraction in foodgrain production since 1987/88. Apart from the effects of unfavorable weather conditions, the 14 percent fall in rice prices in 1993/94 might also have had some adverse effects on crop cultivation during the year. It was reported that many farmers reduced their use of fertilizers and diesel for irrigation to reduce production costs. A 9 percent reduction in acreage sown to boro rice also contributed to the fall in foodgrain production.

1. Production in 1994/95

The growth in foodgrain production suffered further severe setback in 1994/95 when the volume of production fell by 5.7 percent. This was due to both unfavorable weather conditions and inappropriate market intervention by the Government. Aman rice cultivation was affected by mild to severe drought.[4] Rainfall in the northwest districts registered a 50 percent shortfall. Aman production in 1994/95 was estimated at 8.5 million tons, a decline of 9.8 percent from the 1993/94 level. The financial impact of reduced aman cultivation was significant as the income of landless and rural poor in the northwestern part of the country

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[4]The aman crop is planted in July-August and harvested in November-December, the boro crop is planted at end-December and harvested in March-April, and aus is planted in January-February and harvested in April-May.

declined substantially. The Government had to provide safety net programs to reduce the hardship of the people in the drought-affected districts.

Production of boro rice, which is the major cash crop of the farmers, also declined by 3.4 percent from 6.8 million tons in 1993/94 to 6.5 million tons in 1994/95. This reduction was mainly due to inadequate availability of fertilizer resulting from the serious disruption in fertilizer supply during the peak planting season. It was reported that the farmers used 35-40 percent less urea compared to pre-season intentions and most of the boro crop did not receive the last top dressing of urea.

2. Fertilizer crisis

The fertilizer crisis in late 1994 and early 1995 was caused by a supply shortage of urea coupled with the Government's inappropriate intervention in the distribution system, resulting in farmers' protests, demonstrations, road blockades and hartals (general strikes). The demand for fertilizer was high during the peak boro planting season in late 1994 and early 1995 as the farmers tried to compensate for the losses of the last aman crop. Also, a 35 percent sharp rise in the price of rice from January 1994 to January 1995 induced farmers to engage in extensive boro cultivation. However, the concerned government agency underestimated this demand and allowed excessive export of urea. From July 1994 to December 1995, while production of urea fell by 9 percent compared with the production during the same period in 1993/94, exports of urea rose by 52 percent from 273,000 tons to 413,000 tons (see Table 3). This resulted in a serious supply shortage in the domestic market. The local sales of urea from November to December 1994, one month before boro transplanting peak season, declined to 186,000 tons or a 70 percent drop from the same period in the previous year. The opening stock of urea was also reduced to 170,000 tons in November to December 1994.

The distorted price system of fertilizers also aggravated the shortage. The Government controlled ex-factory prices of fertilizers were substantially below world market prices. For example, the ex-factory price of urea in 1994/95 of about $93 per ton was only 37 percent of the import parity price of $250 per ton. This large price difference encouraged exports and led to arbitrage and rent-seeking behavior. Furthermore, the controlled price not only induced speculative holdings at a time of increasing demand, but also prevented the distributors from importing urea during the period of supply shortages. As a result, despite a 20 percent increase in demand, the local sales of urea reached 0.5 million tons during the boro transplanting period (December 1994 to February 1995), or about 24 percent below the level during the same period in 1993/94. Due to mechanical problems in some factories, the supply of urea in March-July 1995 further declined by 3.7 percent compared to the same period in 1994.

The Government tried to resolve the crisis of the fertilizer market by imposing a ban on urea export and by encouraging the local authorities to participate in fertilizer distribution. The latter proved to be counterproductive, thus further aggravating the situation. The policy

of distributing fertilizers through local government authorities disrupted the delivery schedule
of private distribution and led to rent-seeking and patronage. The Government also
introduced a maximum retail price of Tk 230 per bag of urea, leading to further confusion in
the market. The administration of the retail price was not feasible due to the severe shortage
of fertilizers in the market as well as cost factors involved in marketing fertilizers at various
locations. The average retail price of urea rose to Tk 327 per bag in March 1995 and reached
as high as Tk 400-500 per bag in some parts of the country.

Table 3. Bangladesh: Opening Stocks, Production, Export, and
Domestic Sales of Urea, 1993/94-1994/95

(In thousands of metric tons)

Months	Opening Stock	Production	Export	Domestic Sales	Opening Stock	Production	Export	Domestic Sales
		1993/94				1994/95		
July	276	129	53	132	362	176	71	129
August	215	178	43	189	388	122	94	151
September	161	187	6	177	216	183	63	199
October	165	188	30	89	110	188	61	168
November	235	185	56	150	73	158	58	102
December	214	166	84	166	97	167	66	84
January	130	194	27	225	116	212	21	198
February	73	175	0	203	101	168	0	199
March	48	201	2	130	68	170	0	208
Total		1,603	301	1,461		1,544	434	1,438

Source: Data provided by the Bangladesh authorities.

3. Price swings

Changes in the supply situation of foodgrains led to swings in domestic food prices in recent years (Table 4). The market price of rice fell by 21 percent during the second half of 1992/93 due to the record harvest of boro in 1991/92 and unusual stock piling by the private traders and millers. As part of the reform programs supported by the donors, the Government gradually reduced its role in foodgrain distribution. However, when the private traders realized that public procurement had been suspended for an indefinite period, they sold their surplus stocks causing the abrupt fall in prices.

Rice prices began to rise in the second quarter of 1993/94 following a bad aman harvest. From January 1995, when it was evident that the aman production suffered a major setback, the acceleration in prices was rather steeper, reflecting a rebuilding of private stocks. The possibility of a reduction in boro crop production due to the disruption in fertilizer supply further aggravated the price situation. In May 1995, the increase in the retail rice price was 16.5 percent compared to that in May 1994 and 51 percent compared to that in May 1993.

D. Production Outlook for 1995/96

Unfavorable weather conditions during the first quarter of 1995/96 dampened the foodgrain production outlook for the period. The target of foodgrain production for the fiscal year was set at 20 million tons, a 10 percent increase from the production of the previous fiscal year. However, due to vast floods at both maturity and harvest stages of crops, the aus output dropped to 1.7 million tons, 8 percent lower than targeted.

Owing to severe floods in August 1995, aman production in 1995/96 was also affected both at the time of seeding and transplantation. Actual plantation area of aman was only 79 percent of the target level. In late September, production in the northwestern district was again affected by floods. While it was still too early to provide a precise assessment, the Ministry of Agriculture estimated the loss to be as high as 1.8 million tons alone, with aman output expected to be 4 percent below the level of 1994/95.

The impact of the shortage of foodgrain could be further aggravated by the following factors. First, a sharp increase in the price of foodgrain in the world market could have a substantial adverse impact on the food situation in Bangladesh. Reflecting the strong demand coupled with low production in many countries, international rice prices increased by 25-30 percent from April 1995 to September 1995. Wheat prices also showed an upward trend as there were lower harvests in the United States and Australia. World grain production stagnated in the first half of the 1990s, while world population had grown by 440 million during the same period.

Table 4. Bangladesh: Open Market Price of Coarse Rice, 1990/91-1994/95

(Taka per metric ton)

	1990/91	1991/92	1992/93	1993/94	1994/95
July	9,340	10,540	10,860	8,100	10,850
August	9,770	10,640	10,700	8,140	11,220
September	9,800	10,710	10,430	8,590	11,670
October	10,030	10,940	9,610	8,730	12,030
November	10,200	10,550	8,720	8,770	12,180
December	9,900	10,210	8,540	8,750	11,730
January	10,190	10,510	8,700	9,400	12,637
February	10,300	10,770	8,670	10,360	12,715
March	10,710	11,020	8,640	11,150	13,740
April	10,670	11,480	8,600	11,550	13,580
May	10,130	10,710	8,570	10,900	12,710
June	10,110	10,540	8,300	10,720	12,220
Average	10,096	10,718	9,195	9,597	12,274

Sources: Data provided by the Bangladesh authorities and the World Food Programme.

Second, while the international price of foodgrain surged, the domestic price declined due to massive public foodgrain operations. The average paddy price in September was about 3 percent lower than that of August and 5 percent lower than that of April 1995. While the fall in rice prices could help stabilize domestic inflation, the widening gap between international and domestic foodgrain price might discourage private sector to import foodgrains. In 1994/95, the private sector imported 1.0 million tons of foodgrain, 40 percent higher than the Government's imports.

Third, the availability of fertilizer, which was one of the main reasons for the shortage of foodgrain supply in 1994/95, was also not very promising. The production target of urea for 1995/96 was slightly below the production in 1993/94. However, even this modest target was ambitious given the frequent hartals and mechanical failure of several state-owned fertilizer plants.

As of late-1995, it was estimated that even under the best scenario that assumes imports of the private sector in 1995/96 to be at the same level as in 1994/95, the Government's food account deficit would increase from Tk 7 billion in 1994/95 to about Tk 9 billion in 1995/96 (Table 5).

E. Prospects for Further Reform

With the population occupying only 0.1 hectare of arable land per capita, the key objective in the agriculture sector in Bangladesh in the medium term is to maintain a sustainable level of foodcrop self-sufficiency. While the recent setback in the growth of foodcrop production has increased the uncertainty of meeting this goal, there is still a high possibility that the country will be able to achieve foodgrain self-sufficiency by the end of the century. The growth rate of foodgrain production may rebound strongly in 1996/97 as the production base has been low due to the two consecutive years of negative growth. It is projected that with continued improvements in yield and irrigation management and barring any major floods, agriculture growth could rise to about 3 percent by 1999/2000. The country still has significant potential for increasing foodcrop production, especially of winter crops. International comparison shows that farmers in Bangladesh applied roughly one-third as much fertilizer per hectare as farmers in China; irrigated a smaller percentage of arable land compared to China, Indonesia, and Vietnam; and used lower quality seeds compared with other Asian countries. Any improvement on those inputs, therefore, will increase the average yield of foodcrop production in Bangladesh.

However, it should also be noted that attainment of high agricultural growth rate in the long run will probably depend on the contribution of non-rice crops and nonfood crops subsector. This is because the potential for growth in rice production and marginal returns from further investment in this area are expected to decline unless there are major technological breakthroughs. A recent study showed that crops that demonstrated a comparative advantage

Table 5. Bangladesh: Food Account Operations, 1994/95-1995/96

(In thousands of metric tons unless otherwise specified)

	Rev. Est. 1994/95	Budget 1995/96	Staff Est. 1/ 1995/96
Gross production 2/	18,080	20,000	17,895
Aus	1,791	1,800	1,650
Aman	8,504	9,800	8,200
Boro	6,540	7,200	6,800
Wheat	1,245	1,200	1,245
Net (90 percent of gross)	16,272	18,000	16,106
Consumption (annual)	18,617	20,000	18,917
Population (in millions)	119	121	121
Daily consumption per capita (by ounce)	15.1	16.0	15.1
Net (shortage = "-")	-2,345	-2,000	-2,811
Total imports			
Aid (all wheat)	813	857	761
In millions of U.S. dollars 3/	137	150	150
Private sector	1,013	368	950
Rice	583	202	500
Wheat	430	166	450
Government (commercial)	620	775	1,100
Rice	230	300	400
Wheat	390	475	700
International prices (per metric ton)			
Rice		265	344
Wheat		175	197
Exchange rate (Tk/US$)		40.3	40.7
Food account deficit (in millions of taka)	7,000	6,830	8,827

1/ Based on discussions with Ministry of Food and Ministry of Agriculture.
2/ Data provided by Ministry of Food and estimates based on discussions with Ministry of Agriculture.
3/ Food aid estimates are based on commitments in U.S. dollars.

include fruits, vegetables, maize, sunflower, and soybean, and potentially cotton. These crops could provide better financial returns to the farmers and more effectively utilize water supply in the dry season. However, both research and extension of the current technology is required to achieve this potential. Private sector development of appropriate marketing arrangements and improvement of rural infrastructure to facilitate foodgrain transportation are also important factors for the success of diversification.

III. The Implementation of the Annual Development Program (ADP)[5]

A. Introduction

This chapter is organized in four sections: the second section reviews trends in the level and composition of the ADP; the third section reviews ADP projects; and the fourth section discusses issues in prioritization and implementation of the ADP.

B. Trends in the Level and Composition of the ADP

In addition to a Three-Year Rolling Investment Program, and now also a 15-year Participatory Perspective Plan, the Ministry of Planning prepares an ADP that is synchronized with the Government's annual budget cycle. The ADP covers both current and capital expenditure of ongoing development projects. Financing is provided through domestic and foreign resources, both repayable (i.e., borrowing) and nonrepayable (i.e., taxes and grants).

1. Overall trends

For many years, Bangladesh experienced significant shortfalls in project implementation on account of institutional constraints as well as taka funding shortfalls. There has been a noticeable improvement after 1992/93, with the overall rate of implementation reaching 94 percent and 93 percent of the target in 1993/94 and 1994/95, respectively. At the same time, the domestic share of taka funding, including budgetary resources and domestic borrowing, rose rapidly from virtually nil at the beginning of the decade to about 40 percent in 1994/95. This was, to a considerable extent, due to an enhanced revenue effort. Also, the disbursement performance has improved considerably, with project aid disbursement reaching $1.3 billion in 1994/95.

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2. Sectoral composition

In recent years, there has been a significant shift in the sectoral composition of ADP expenditure in favor of the social sector, in particular, education (Table 6). Expenditures on education increased by more than three-fold during the last five years to reach 14 percent of total ADP by 1994/95, while the share of expenditures on health and family planning doubled to account for 8 percent during the same period. However, the share of expenditures on the development of water resources fell sharply from 17 percent in 1989/90 to just 6 percent in 1994/95 and that on industrial development fell from 8 percent to about 1 percent. Infrastructure and energy together have continued to be the largest claimant of ADP resources, accounting for over two-fifths of total ADP expenditure.

C. Review of ADP Projects in 1995/96

A provisional review was made of projects included in the ADP for 1995/96 (both existing and new projects). The review covered all the principal sectors, including agriculture, industry, mineral resources, education, and health.

A functional classification of ADP expenditure on agriculture suggested that over two-thirds involved the provision of goods or services that could be supplied in the market by the private sector. This was borne out by the review of a sample of projects covering a broad range of agricultural activities, such as seed development, rice production, and food processing. A similar conclusion could be drawn from a review of selected industrial projects, including manufacturing, mineral resources, power, and transportation projects. In addition, the review suggested that projects in these sectors generally would benefit from improved preparatory work, including assessment and feasibility studies, and prioritization.

A review of the important education sector suggested that a higher share of expenditure should be allocated to primary education if the Government's target of universal primary education is to be attained in an acceptable time frame. Moreover, the food-for-education program, which accounted for about 35 percent of ADP expenditure on primary education, reached a relatively small proportion of the enrolled children, and its net impact on promoting primary school enrollment had not been fully assessed.

Expenditure in the health sector was heavily weighted in favor of secondary, tertiary, and institutional health care. This was especially so for the non-aided portion of the program. These projects were found to be cost-ineffective, and private sector involvement was recommended.

Table 6. Bangladesh: Annual Development Program by Sectoral Share, 1989/90-1995/96 1/

(In percent of total)

	1989/90	1990/91	1991/92	1992/93	1993/94	Est. 1994/95	Budget 1995/96
Agriculture and water resources	26.0	23.0	21.2	20.7	17.5	18.2	20.0
Agriculture	5.7	5.9	7.0	5.6	5.8	5.2	5.7
Rural development	3.1	4.2	5.3	5.6	5.3	6.6	6.9
Water and flood control	17.1	12.9	9.0	9.5	6.3	6.3	7.4
Industry	7.5	1.9	2.0	1.1	1.8	1.3	1.4
Power, scientific research, and natural resources	17.4	14.3	17.6	22.7	17.4	17.2	15.0
Transportation 2/	13.2	12.0	13.9	14.8	17.1	18.9	19.2
Communications	3.0	2.1	2.7	2.3	6.0	4.4	5.1
Physical planning and housing	5.1	4.4	5.1	3.7	3.6	4.7	5.5
Education	4.0	3.2	5.0	8.1	10.2	14.3	13.2
Health	1.7	2.7	2.3	3.2	3.1	3.6	3.9
Family planning	3.8	5.9	4.5	4.3	4.6	4.6	4.3
Social welfare	0.5	0.6	0.5	0.5	0.4	0.7	1.5
Other sectoral	0.5	0.8	0.8	1.4	0.9	2.0	2.2
Nonsectoral 3/	17.2	29.3	24.4	17.4	17.5	10.3	8.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Ministry of Planning, Implementation, Monitoring, and Evaluation Division (IMED).

1/ The aggregate ADP expenditure figures provided by the ERD may not correspond to those calculated by the IMED.
2/ Includes Jamuna Bridge.
3/ Comprises block allocations, technical assistance, and self-financing.

D. Issues in Prioritization and Implementation

The review of projects suggested that there is considerable scope for improving the selection, prioritization, and implementation of projects included in the ADP. The issues here do not only revolve around the intrinsic quality of ADP projects, but also the total amount of ADP expenditure, especially in periods when the overall level of government spending needs to be constrained to match available resources.

1. Prioritization of ADP projects

Based on the preceding project review and the Government's strategy for human resource based economic growth to overcome poverty, it is suggested that criteria used by Government to select specific projects for inclusion in the ADP should focus on: (i) activities with a clear rationale for public (as opposed to private) sector financing or provision; (ii) activities that make the highest net contribution to social welfare; and (iii) activities that have the greatest impact on poverty reduction.

Over 80 percent of ADP projects are ongoing (as opposed to new) ones, and the criteria should therefore be applied to both ongoing and new projects, when resource constraints call for a cutback in ADP spending. This requires procedures to restructure or eliminate ongoing projects, including the preparation of pruning reports.

Whereas the selection criteria should, in principle, be applied early in the ADP planning process, this does not mean that projects, once approved at the various government levels, should automatically be eligible for financing under the ADP. This is particularly important for locally financed projects, the quality of which tends to be less assured than that of aided projects. It is notable that, with the exception of technical assistance, a large share of projects included in the ADP were not subjected to the specified approval process.[6] There is clearly a need for such projects not to be included in the ADP, or at least not funded, until they have fulfilled the established public expenditure criteria.

The concept of a "core" program, or a list of high quality/priority projects, could be a useful prioritization tool at times when budget constraints require a cutback in overall spending levels. This approach could promote greater transparency and discipline in prioritization of capital expenditure, ensuring adequate funds for core projects, while limiting the number of low-priority projects, including "politically mandated" or "prestige" projects. ADP project preparation procedures could also benefit from linking the ADP more effectively with the Three-year Rolling Investment Program.

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[6]This means that the Project Concept Paper has not been approved at an appropriately high level of government. In addition, there are many projects in the ADP for which the more detailed project Pro Forma has not been approved by the line ministry concerned.

Table 7. Bangladesh: Fertilizer Statistics, 1988/89-1994/95

	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	Est. 1994/95
	(In thousands of metric tons)						
Total	2,121	1,997	1,991	2,394	2,549	2,765	3,111
Domestic production	1,586	1,621	1,532	1,787	2,168	2,444	2,236
Imports	535	376	459	607	381	321	875
Sales	2,105	2,187	2,373	2,389	2,640	2,355	2,439
Local	1,710	2,043	2,091	2,251	2,253	1,852	2,001
Exports	395	144	282	138	387	503	438
Closing stock	645	531	242	299	331	413	379
	(In taka per metric ton)						
Domestic wholesale prices							
Urea	4,025	4,025	4,025	4,246	4,541	4,075	3,720
Triple superphosphate	6,619	6,619	5,500	6,360	6,860	6,860	8,000

Source: Bangladesh Chemical Industries Corporation (BCIC).

2. Implementation of the ADP

In addition to quality issues, there is also a need to improve the ADP expenditure estimation and implementation process. In this connection, it is noted that close to 30 percent of the full year's expenditure was recorded in the final month of 1994/95. Moreover, although the Planning Ministry's estimates of aggregate ADP expenditure suggest a noticeable improvement in the implementation performance, the factors underlying this improvement are not fully understood. In addition, for individual projects, implementation lapses and delays are noted. A major problem area remains the procurement processing and approval at various stages of the procurement cycle (especially at the stage of review and approval by the line ministries, and at the stage of evaluating bids by the executing agencies). The bunching of expenditures at the end of the fiscal year also points to delays in initiating activities.

Despite efforts at improving guidelines for ADP expenditure, further improvement is needed in the following areas, including: (i) the procurement planning process--which some agencies have been doing on an ad hoc basis--should be institutionalized and applied consistently; (ii) training of personnel involved with procurement should be intensified in order to familiarize them with current guidelines and procedures; (iii) procurement management should be strengthened, and there should be greater delegation of procurement authority; and (iv) agencies should be held accountable for performance, and lapses and delays should give rise to corrective interventions.

IV. The Implications of the Uruguay Round Agreement for Bangladesh[7]

A. Introduction

The conclusion of the Uruguay Round (UR) and the entry into force on January 1, 1995 of the World Trade Organization (WTO) represent an important step toward strengthening international trading relations. The Round provides for a reduction in trade barriers to both industrial and agricultural products, as well as increased and more secure market access through more tariff bindings;[8] integrates trade in agricultural products, and textiles and clothing into the framework of multilateral rules and disciplines; extends the reach of multilateral trade rules to new areas, such as services, investment, and intellectual property rights; clarifies the rules in

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[7]Prepared by Ali Ibrahim (PDR).

[8]A tariff binding is a commitment by a country not to increase a specified customs duty beyond a certain level ("the bound level") without consulting and/or compensating its trading partners. Tariff bindings increase the predictability of a country's trade regime, and hence contribute to greater certainty in trade and investment decisions.

many areas, including those involving the use of subsidies, and antidumping and countervailing duties; and strengthens the dispute settlement mechanism.[9]

Countries that undertook the most meaningful liberalization stand to gain most from the UR, but in order to reap the benefits from increased export opportunities, these countries may need to improve their supply capacity. Developing countries are expected to benefit from their own efforts at reducing trade barriers, and making their trade regimes more transparent and rules-based. They will also gain from the Round through the liberalization in their export markets of, for example, agriculture, and textiles and clothing (the latter owing to the phaseout of the Multifiber Arrangement (MFA)).

However, some developing countries, including Bangladesh, have raised concerns about two potentially negative side effects related to the market liberalization results of the Round. The first results from the erosion of preference margins in the markets of industrial countries following tariff reductions on a most-favored-nation (MFN) basis. The second stems from higher food import prices that are likely to be associated with the liberalization in agriculture, particularly the reduction in subsidies.

This chapter provides a preliminary assessment of the implications of the UR for Bangladesh and focuses on the impact during the transition period when the MFN will be phased out. These implications are related to changes in Bangladesh's trade regime as a result of specific commitments it has undertaken under the Round, as well as to changes in the external trading environment facing Bangladesh, as a result of liberalization commitments made by trading partner countries. The analysis indicates that Bangladesh's trade regime will not be significantly affected by the UR. It appears, however, that as a result of increased market access for ready-made garments, during the transition period up to end-2004 after which the MFA will be phased out, the Round could result in an increase in Bangladesh's net exports of about $280 million (or 1 percent of 1992 GDP). The impact after 2004 will depend crucially on the competitiveness of the Bangladesh garment industry.

The chapter is organized as follows: the second section examines how commitments undertaken by Bangladesh and other obligations resulting from the Round will affect its trade regime; the third section describes the main changes to Bangladesh's external trading environment, and quantifies their impact on Bangladesh's exports and imports; and the fourth section draws some preliminary conclusions.

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[9]For a detailed discussion of the results of the Uruguay Round, see Kirmani and others (1994).

Table 8. Bangladesh: Schedule of Commitments for Industrial Products

H.S. Code	Brief Description of Products	Pre-Uruguay Round Applied Rate of Duty 1/ (%)	Post-Uruguay Round Bound Rate of Duty (%)	Post-Uruguay Round Bound Rate of "Other Duties and Charges" (%)
0306.13&23	Shrimps and prawns	45	50	30
2523.10	Cement clinkers	7.5	50	30
3006.60.90	Chemical contraceptive preparations	0	50	30
3103.10	Superphosphates (fertilizers)	0	50	30
5303.10	Raw jute	30	50	30
6305.10.10	Sacks and bags of jute	60	50	30
7201.10	Non-alloy pig iron	7.5	50	30
7302.10	Rails	15	50	30
8401.10	Nuclear reactors	30	50	30
8402.00	Steam or vapor boilers and boiler parts	0; 7.5; 30	50	30
8403.00	Central heating boilers and boiler parts	0; 30	50	30
8407.10	Aircraft engines	7.5	50	30
8410.11	Hydraulic turbines of power not exceeding 1,000 KW	30	50	30
8410.12	Hydraulic turbines of power exceeding 1,000 KW but not exceeding 10,000 KW	30	50	30
8410.13	Hydraulic turbines of power exceeding 10,000 KW	30	50	30
8411.91	Parts of turbo-jets	30	50	30
8411.99	Parts of gas turbines	30	50	30
8434.10	Milking machines	7.5	50	30
8434.20	Dairy machinery	7.5	50	30
8439.90	Machinery for making paper or paper board	15	50	30
8471.20	Digital automatic data processing machines	7.5	50	30
8471.91	Other digital processing units, whether or not with system	7.5	50	30
8471.92	Input or output units, whether or not with system	7.5	50	30
8473.30	Parts and accessories of machines of heading No. 84.71	7.5	50	30
8525.20	Transmission apparatus incorporating reception apparatus	0; 7.5; 15	50	30
8601.10	Rail locomotives--powered from an external source of electricity	15	50	30
8601.20	Rail locomotives--powered by electric accumulators	15	50	30
8602.10	Diesel electric locomotives	15	50	30
8603.10	Self-propelled railway or tramway coaches, vans and trucks powered from an external source	15	50	30
9020.00.10	Gas masks and similar respirators	7.5	50	30
9021.40	Hearing aids, excluding parts and accessories	7.5	50	30

Source: WTO

1/ As per the 1994/95 operative tariff schedule. In case of multiple rates, these correspond to those applying to the different sub-headings at an eight-digit H.S. code.

B. Implications of the UR for Bangladesh's Trade Regime

Bangladesh's commitments under the UR involved tariff bindings for some industrial products, the elimination of all quantitative restrictions (QRs) on agricultural products and their replacement with tariffs, and a very limited commitment under the services agreement.

1. Tariff bindings for industrial products

Prior to the UR Bangladesh had no bound tariffs. Under the Round, Bangladesh has agreed to bind tariffs on 32 tariff lines (out of a total of 4,579 lines at a six-digit Harmonized System (HS) code level) at a rate of 50 percent (Table 8). Under the Round, countries were also required to bind any "other duties and charges" applicable to the items included in their schedule of commitments. Bangladesh inscribed a rate of 30 percent as other duties and charges in its schedule. The bindings became effective on January 1, 1996.

Compared to previous rounds of multilateral trade negotiations, the commitments undertaken by Bangladesh--although still modest--represent a positive step toward increased participation in the multilateral trading system. However, the product coverage of those commitments (only 0.7 percent of all six-digit HS tariff lines) is very limited and, consequently, would not contribute significantly to enhancing the stability and predictability of Bangladesh's trade regime.[10] In addition, except for jute bags and sacks, tariff bindings have been set well above applied rates and would not entail any liberalization of Bangladesh's import regime (apart from increased transparency and certainty). In this regard, Bangladesh lost a valuable opportunity to lock in its significant trade liberalization achievements of recent years.[11]

2. Elimination of QRs and tariffication in agriculture

Under the Uruguay Round agreement on agriculture, Bangladesh (like all participating countries) is required to eliminate all QRs on agricultural products and replace them by

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[10]For jute bags and sacks, tariffs were reduced in July 1995 from 60 percent to the bound level of 50 percent.

[11]Bangladesh liberalized its trade regime unilaterally both during the protracted UR negotiations, and also after the conclusion of the Round. For example, between 1991/92 and 1995/96, the maximum tariff was reduced from 400 percent to 52.5 percent (including the 2.5 percent license and permit fee); the number of tariff rates was narrowed from 11 to 7; and the number of items subject to trade-related QRs was reduced from 137 to 41.

tariffs.[12] As a result, like many developing countries, Bangladesh chose to introduce a ceiling binding--albeit at a quite high rate--of 200 percent for all its agricultural tariff lines, except for 13 four-digit HS tariff lines for which tariff bindings were set at 50 percent (Table 9). In addition, Bangladesh set a rate of 30 percent as "other duties and charges" for all agricultural products. These bindings came into effect on January 1, 1996, except for five tariff lines for which the bound rate has to be reached by 2004.

Bangladesh's commitments under the agreement on agriculture will help enhance the transparency of the trade regime by replacing nontariff border measures by tariffs, but will not provide any meaningful reduction in the level of protection given the very high level of tariff bindings and the lack of any obligation to reduce tariffs.[13]

3. Other commitments and obligations

a. Trade in services

The General Agreement on Trade in Services (GATS) provides, for the first time, a set of multilateral rules for the conduct of trade in services, and simultaneously creates a framework for a continuing process of liberalization in this sector. The GATS introduced two sets of obligations for member countries, including Bangladesh: (i) general obligations that apply to all measures affecting trade in services; and (ii) specific negotiated obligations that apply only to those services sectors listed in the member's schedule of commitments. Under the general obligations, Bangladesh is required not to discriminate between service suppliers of other GATS members (the MFN obligation), and to establish within two years (although some flexibility is allowed) enquiry points to provide specific information to other members. The extent of Bangladesh's specific commitment in services is limited to allowing foreign direct investment in the five-star hotel and lodging service sub-sector, as well as the employment--

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[12]As a least developed country, Bangladesh is exempted from the obligations under the agreement on agriculture to reduce tariffs, domestic support, and export subsidies on agricultural products, in contrast to developed countries which are required--over a period of 6 years--to reduce: (i) tariffs by a simple average of 36 percent with minimum reductions of 15 percent for each tariff line; (ii) domestic support (with some exemptions) by 20 percent; (iii) the value of direct export subsidies to a level 36 percent below the 1986-90 base period level; and (iv) the volume of subsidized exports by 21 percent. Obligations for developing countries are set at two-thirds of those of developed countries and are to be implemented over 10 years.

[13]Bangladesh's schedule of commitments for agricultural products entails a tariff reduction for green and black tea from the applied rate of 60 percent on January 1, 1995 to the bound rate of 50 percent by end-2004. This tariff reduction was effected in the 1995/96 budget, but is not likely to provide market access for these products for which Bangladesh has a relatively strong comparative advantage, and is an important exporter.

Table 9. Bangladesh: Schedule of Commitments for Agricultural Products 1/

H.S. Code	Brief Description of Products	Pre-Uruguay Round Applied Rate of Duty 2/ (%)	Post-Uruguay Round Bound Rate of Duty (%)	Post-Uruguay Round Bound Rate of "Other Duties and Charges" (%)	Implementation Period
0101.11	Live horses	7.5	50	30	1995
0104.10	Live sheep	7.5	50	30	1995
0105.11	Live fowls	30.0	50	30	1995
0208.20	Frog legs	45.0	50	30	2004
0501.00	Human hair	30.0	50	30	1995
0701.10	Seed potatoes	7.5	50	30	2004
0902.10	Green tea (non-fermented)	60.0	50	30	2004
0902.30	Black tea	60.0	50	30	2004
1006.10	Rice in the husk	7.5	50	30	1995
1008.30	Canary seeds	15.0	50	30	1995
1201.00	Soyabeans (seeds)	15.0	50	30	1995
1207.20	Cotton seeds	15.0	50	30	1995
1703.10	Molasses	45.0	50	30	2004

Source: WTO.

1/ For all agricultural products not included in this table, tariffs and "other duties and charges" are bound at rates of 200 percent and 30 percent, respectively.

2/ As per the 1994/95 operative tariff schedule.

in connection with the investment--of foreigners in higher management and specialized jobs, in accordance with the relevant laws and regulations of Bangladesh.

b. Trade-Related Investment Measures

Under the agreement on Trade-Related Investment Measures (TRIMs), WTO members are required not to impose any measure that is inconsistent with the provisions of Article III (national treatment) or Article XI (general elimination of quantitative restrictions) of the GATT, unless it can be justified under GATT exceptions. In the case of Bangladesh, these exceptions would include the balance of payments safeguard measures (GATT Article XVIII:B), and the protection of infant industries (GATT Article XVIII:C). TRIMs inconsistent with GATT Article III or XI include measures affecting companies with foreign investment that require particular levels of purchase or use of products of domestic origin (i.e., local content requirements) or that restrict the volume or value of imports to an amount related to the level of exports (i.e., trade balancing requirement). Bangladesh is required to eliminate any TRIM (notified to the WTO) that is inconsistent with the agreement, by January 1, 2002.

c. Protection of Intellectual Property Rights

The UR agreement on Trade-Related Intellectual Property Rights (TRIPs) provides for national treatment, MFN treatment, minimum standards of protection and enforcement of Intellectual Property Rights (IPRs), such as patents, copyrights, industrial design, geographical indications, and trademarks. As a less-developed country, Bangladesh may delay the application of some of the provisions of the agreement until January 1, 2006, but was required to implement the national treatment and MFN provisions by January 1, 1996.

d. Subsidies

As a least developed country, Bangladesh is exempted from the obligations to reduce domestic and export subsidies for agriculture. For industrial products, the UR agreement on subsidies does not subject least developed countries such as Bangladesh to the prohibition on export subsidies, but requires them to phase out subsidies on the use of domestic inputs over imported inputs by January 1, 2003.

C. Impact of the UR on Bangladesh's Balance of Payments

The likely impact of the UR on Bangladesh's balance of payments is analyzed by using a static partial equilibrium approach.[14] Given the predominance of the garment sector in total exports, the impact on Bangladesh's exports results primarily from the effects of the Agreement on Textiles and Clothing (ATC) on export of garments.[15] Other exports will be affected by tariff cuts by Bangladesh's trading partners. In particular, Bangladesh's exports enjoying preferential access may be adversely affected. On the import side, Bangladesh will be affected by changes in world food prices as a result of the liberalization in agriculture. Overall, the impact of the Round on Bangladesh's balance of payments is likely to be positive, at least during the period through 2005, as higher exports of garments would more than compensate for lower exports of other products--due to erosion of preference--and a slightly higher food import bill.

1. Impact of the Agreement on Textiles and Clothing on exports of garments

The ATC calls for the elimination of quotas in four stages over a ten-year period (1995-2004), and provides for an increase in the growth rate of MFA quotas for those items still under quota during the transition period (see Box). It is difficult to quantify the effects of the complete liberalization of the textiles and clothing markets, since these will depend on the overall demand for textiles and clothing in the importing countries, and the relative competitiveness of all exporters after the ten-year transition period. This study is therefore limited to assessing the impact over the transition period of the ATC on Bangladesh's exports of ready-made garments to its two major markets--the United States and the European Union (EU)--which together accounted for about 95 percent of the country's exports of ready-made garments in 1993/94.[16]

For this purpose, a distinction is made between Bangladesh's exports of ready-made garment items subject to quotas (quota-items) and those items not subject to quotas

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[14]The partial equilibrium approach is justified in light of the small size of Bangladesh's economy and its share of total world trade, although shifts in the underlying demand/supply functions should call for a cautious interpretation of the results. The methodology used in this analysis is explained in more detail in Shiells and others (1996). The income and welfare effects of the Round on Bangladesh are not examined in this paper.

[15]Exports of ready-made garments increased from $3.3 million (or 0.5 percent of total exports) in 1980/81 to $2.2 billion (or 64.3 percent of total exports) in 1994/95.

[16]Bangladesh's exports of garments to Japan are negligible (less than $5 million in 1994/95).

Box. Highlights of the ATC and its Implications for Bangladesh's Exports

The Uruguay Round Agreement on Textiles and Clothing (ATC) provides for the phase out of the MFA in four stages over a period of ten years. At the beginning of the first stage on January 1, 1995, countries maintaining quotas on textiles and clothing are required to fully integrate into GATT 1994 a list of products which accounted for at least 16 percent of their 1990 import volume (integration means that quotas should be eliminated and trade in these products should be governed by the general rules of GATT/WTO). At the beginning of the second stage on January 1, 1998, an additional list of products which accounted for no less than 17 percent of 1990 import volume should be integrated. At the beginning of the third stage on January 1, 2002, products which accounted for no less that 18 percent of 1990 imports should be integrated. All remaining products should be integrated at the beginning of the fourth stage on January 1, 2005.

An examination of the schedules of integration of the main importing countries, mainly the EU and the United States indicates that these countries chose to initially integrate product categories that were not restricted, meaning that liberalization of the categories under the MFA quotas (the most sensitive ones) would be heavily backloaded. The schedule of integration released by the United States indicates that Bangladesh quotas would not be affected in the first and second stages, and only few minor items would be liberalized in the third stage, implying that the bulk of the items exported by Bangladesh would remain under quota until the final stage.

In addition, for those items still under quota during the transition period, the ATC provides that the growth rate of MFA quota (8 percent for Bangladesh in the United States market) should be increased by a factor of 16 percent each year during the period 1995-97; then by 25 percent each year during the period 1998-2001, and finally by 27 percent each year during the period 2002-04. As illustrated in the table below, in the case of Bangladesh, on a cumulative basis, exports of ready-made garments under quota would be about 71 percent higher under the ATC than under the MFA. As a result, compared to the MFA, the ATC would ensure Bangladesh with a secured and increased access to the United States market for most of its quota-constrained garments exports at least until January 1, 2005.

Quota Increase for Bangladesh under the MFA and the ATC in the United States Market

Integration Period	Year	MFA Quota Growth Rate (in percent)	MFA Quota	Quota Growth Factor	ATC Quota Growth Rate (in percent)	ATC Quota	Difference (in percent)
Base period		7	100			100	
Jan. 1995- Dec. 1997	1	7	107	16	8.12	108	1
	2	7	114		8.12	117	3
	3	7	123		8.12	126	3
Jan. 1998- Dec. 2001	4	7	131	25	10.15	139	8
	5	7	140		10.15	153	13
	6	7	150		10.15	169	19
	7	7	161		10.15	186	25
Jan. 2002- Dec. 2004	8	7	172	27	12.89	210	38
	9	7	184		12.89	237	53
	10	7	197		12.89	268	71

(nonquota items).[17] In line with recent experience, it is assumed that during the transition period Bangladesh will fully utilize its quotas. For products subject to quotas, by end-2004, Bangladesh's exports of ready-made garments are likely to be higher than they would have been under the MFA, reflecting the acceleration of the growth of quotas under the ATC. Table 10 indicates that, as a result of the UR, Bangladesh's exports of garments subject to quota into the United States will increase by 36 percent from about $1.4 billion to about $1.9 billion over the period 1992-2004.[18]

Bangladesh may suffer a decline in exports of those ready-made garments for which it is not subject to quotas, as a result of increases in quotas granted to competitors. The approach used to estimate this effect involves estimating the effect of the ATC, first, on total imports into the destination market, and then, on exports by suppliers of quota-items. The difference between these two magnitudes, which represents total exports by suppliers of nonquota items, is then apportioned between Bangladesh and other suppliers of nonquota items by assuming that relative market shares within the group of nonquota exporters remain unchanged.[19] Estimates of total import growth of apparel under the ATC relative to the MFA are taken from a study by Hertel and others (1995). This study also provides estimates of the cumulative quota growth rate for the period 1992-2004, under the ATC and the MFA, for major exporters of quota-items. These estimates are used to illustrate the impact of the ATC on Bangladesh's exports of garments in the United States and the EU, with the results presented in Tables 10 and 11.[20]

The results of the simulation indicate that over the period 1992-2004, as a result of the UR, Bangladesh would incur a decline of its exports of nonquota items from $307 million to $262 million (or 15 percent) in the United States market, and from $909 million to $758 million

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[17]Imports of ready-made garments from Bangladesh are not subject to quotas in the EU, whereas in the United States, 31 product categories, which in 1993/94 accounted for over 80 percent of Bangladesh's exports of ready-made garments in that market, are subject to quotas under the MFA.

[18]These results are derived by multiplying the 1992 exports by the cumulative growth rate of quotas under the MFA on one hand, and under the ATC on the other hand.

[19]This assumption implies that Bangladesh would maintain its competitiveness vis-à-vis other nonquota suppliers. If Bangladesh's competitiveness were to deteriorate, this would increase the negative impact of the ATC on its exports of nonquota garment items.

[20]These results should be interpreted with caution as they involve some simplifying assumptions, and are predicated on the robustness of the results of the study by Hertel and others (1995).

Table 10. Effects of the Agreement on Textiles and Clothing (ATC) on Bangladesh's Exports
of Garments to the United States

(In thousands of 1992 U.S. dollars, unless otherwise specified)

Exporting Countries	1992 Exports	MFA Cumulative Growth Rate 1992-2004 1/ (%)	2004 Exports under MFA	ATC Cumulative Growth Rate 1992-2004 (%)	2004 Exports under ATC	Exports under ATC Relative to Exports under MFA (change in %)	Market Share under MFA (%)	Market Share under ATC (%)
Total	32,134,604	68	53,891,035	101	64,669,242	20.0	100.0	100.0
China	5,316,083	60	8,505,733	99	10,579,005	24.4	15.8	16.4
Hong Kong	4,435,386	15	5,100,694	22	5,411,171	6.1	9.5	8.4
Indonesia	987,913	114	2,114,134	191	2,874,827	36.0	3.9	4.4
Korea	2,780,195	10	3,058,215	14	3,169,422	3.6	5.7	4.9
Malaysia	934,050	110	1,961,505	186	2,671,383	36.2	3.6	4.1
Taiwan, Province of China	2,566,422	6	2,720,407	9	2,784,568	2.4	5.0	4.3
Thailand	823,544	106	1,696,501	177	2,281,217	34.5	3.1	3.5
Others	14,291,011	101	28,733,847	144	34,897,649	21.5	53.3	54.0
Others (quota-items)	8,863,521	100	17,727,042	180	24,817,859	40.0	32.9	38.4
Bangladesh (quota-items)	607,299	125	1,366,423	206	1,858,336	36.0	2.5	2.9
Others, Non-quota-items (excl. Bangladesh)	4,666,723	100	9,333,446	71	7,959,695	-14.7	17.3	12.3
Bangladesh (non-quota-items)	153,468	100	306,936	71	261,759	-14.7	0.6	0.4

Memorandum items:
Bangladesh:
Cumulative change in exports of quota-items: 491,913
Cumulative change in exports of non-quota-items: -45,177
Cumulative change in total exports of garments: 446,736
(in percent of 2004 exports under MFA) 26.7

Sources: United Nations COMTRADE data base for imports figures; Hertel and others (1995), Table 4, for MFA and ATC cumulative growth rates.

1/ Cumulative growth rates for other suppliers (constrained and non-constrained), as well as for Bangladesh (non-constrained) are those assumed for the rest of the world in the source table.

Table 11. Effects of the Agreement on Textiles and Clothing (ATC) on Bangladesh's Exports of Garments to the European Union

(In thousands of 1992 U.S. dollars, unless otherwise specified)

Exporting Countries	1992 Exports	MFA Cumulative Growth Rate 1992-2004 1/ (%)	2004 Exports under MFA	ATC Cumulative Growth Rate 1992-2004 (%)	2004 Exports under ATC	Exports under ATC Relative to Exports under MFA (change in %)	Market Share under MFA (%)	Market Share under ATC (%)
Total	35,845,807	42	51,018,317	61	57,650,698	13.0	100.0	100.0
China	4,306,124	53	6,588,370	88	8,095,513	22.9	12.9	14.0
Hong Kong	3,996,041	19	4,755,289	28	5,114,932	7.6	9.3	8.9
India	1,623,181	39	2,256,222	61	2,613,321	15.8	4.4	4.5
Indonesia	1,198,226	100	2,396,452	166	3,187,281	33.0	4.7	5.5
Korea	1,298,412	33	1,726,888	50	1,947,618	12.8	3.4	3.4
Malaysia	731,736	66	1,214,682	105	1,500,059	23.5	2.4	2.6
Poland	1,297,315	39	1,803,268	61	2,088,677	15.8	3.5	3.6
Thailand	967,213	99	1,924,754	165	2,563,114	33.2	3.8	4.4
Taiwan, Province of China	698,566	33	929,093	50	1,047,849	12.8	1.8	1.8
Turkey	3,683,766	39	5,120,435	61	5,930,863	15.8	10.0	10.3
Others	16,045,227	39	22,302,866	47	23,561,469	5.6	43.7	40.9
Others (quota-items)	2,611,291	39	3,629,694	61	4,204,179	15.8	7.1	7.3
Others, non-quota-items (excl.Bangladesh)	12,779,871	39	17,764,021	46	18,599,113	4.7	34.8	32.3
Bangladesh (non-quota-items)	654,065	39	909,150	16	758,177	-16.6	1.8	1.3

Memorandum item:
Bangladesh:
Cumulative change in exports of garments: -150,973

Sources: United Nations COMTRADE data base for imports figures; Hertel and others (1995), Table 4, for MFA and ATC cumulative growth rates.

1/ Poland and Turkey are not MFA members. Cumulative growth rates for these countries as well as India, Bangladesh and other suppliers (constrained and non-constrained) are those assumed for the rest of the world in the source table.

(or 17 percent) in the EU market. However, the total decline of $106 million in exports of nonquota items is largely outweighed by the substantial increase of about $490 million in exports of quota-items. Therefore, the phased elimination of quotas under the ATC provides Bangladesh with an increased export opportunity for the garment sector, assuming it maintains its competitiveness and enhances its supply capacity. The need for Bangladesh to improve its competitiveness will assume an even greater importance after 2004 when the elimination of all quotas would create a level playing field in the international market for textiles and clothing. In order to increase its supply capacity, Bangladesh would need to step up its structural reform, including by restructuring public enterprises, notably ailing textile mills, removing QRs on textiles, and reducing the level and dispersion of tariffs. In addition, upgrading the quality of Bangladesh's ready-made garments could contribute to enhancing the value of its exports.

2. Impact of tariff cuts by trading partners on other exports

The analysis in this sector focuses on Bangladesh's three major markets, namely the United States, EU, and Japan, and will also be limited to the main export commodities other than garments.[21] The effects of tariff cuts by Bangladesh's trading partners on exports of a given product varies according to the tariff treatment faced by this product in the destination market.

For products subject to MFN tariffs in the destination market, the generalized MFN tariff reductions following the UR will--other things being equal--lower prices in the importing country and increase demand for total imports.[22] Assuming that for these products export supply in Bangladesh is perfectly elastic, the increase in exports (referred to in this study as the MFN effect) is calculated (in a static framework) as the percentage change in price in the importing market times the import demand elasticity for the product.[23] For the commodities covered in the analysis, Bangladesh faces MFN tariffs only in the United States on shrimps and manufactured jute goods, but these products are already zero-rated, and therefore would not be affected by any UR tariff cuts.

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[21]The analysis covers only export commodities of at least $5 million. The three countries chosen accounted for about 75 percent of Bangladesh's total exports in 1994/95. The remaining exports are largely destined to developing countries, and would not be significantly affected given the limited tariff cuts effected by developing countries under the UR.

[22]The percentage change in price following a change in tariff is given by $dt/(1+t)$ where t denotes the initial tariff rate.

[23]Given the lack of comprehensive and consistent estimates of import demand elasticities by commodity groups in the three export markets, United States import demand elasticities put together by Stern and others (1976) from various studies are used for all the three countries. The results of this study should therefore be interpreted with caution.

Like other developing countries, Bangladesh benefits from preferential access for some of its exports to the United States, the EU, and Japan, under the Generalized System of Preferences (GSP). As a result, the generalized MFN tariff reductions following the UR will result in an erosion of the preference margin on Bangladesh's exports, and hence an improvement in the relative competitive position of nonpreferred suppliers. This will lead to a loss of market share for Bangladesh. The impact of this erosion of preferences on Bangladesh's exports is calculated as the percentage change of the price of the product in the importing country times the cross-price elasticity of import demand for the product.[24]

The results of these calculations reported in Tables 12-14 indicate that for the three destination markets, the erosion of preferences would entail a total loss of exports of less than $5 million, with the EU accounting for more than 80 percent of the total, reflecting the better GSP treatment received by Bangladesh's products in this market. This effect is negligible, especially considering that the UR tariff cuts will be implemented over a five-year period.

3. The impact of the UR Agreement on agriculture on net food imports

The prospects of a reduction in tariffs and subsidies in agricultural products following the UR agreement on agriculture has raised concerns about a possible increase of world food prices among some developing countries, which are net importers of food.[25] A recent study by Goldin and van der Mensbrugghe (1995) found that under the most plausible scenarios of liberalization in agriculture, the effects of the UR on prices of major food commodities would generally be very limited.

The results of the Goldin and van der Mensbrugghe's study are used to estimate the impact on Bangladesh's net food import costs for five commodities, consisting of four imported items (wheat, rice, edible oil, and sugar) and one exported item (tea). The approach, similar to the one used by Eiteljörge and Shiells (1995), consists of comparing a projection of net food imports in the year 2002 assuming liberalization agreed to in the Round is implemented,

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[24]Following Shiells and others (1996), the cross-price elasticity of import demand for the product of a preferred exporter is approximated by the price elasticity of import demand for substitute product from nonpreferred exporters times the ratio of total merchandise imports to domestic absorption of goods (i.e., nonservices GDP plus imports minus exports). The import demand elasticities are taken from Stern and others (1976), and again, given the considerable uncertainties regarding these elasticities, estimates of the effect of preference erosion should be interpreted with caution.

[25]These concerns overlooked the likely beneficial effect of higher food prices on the income, and hence the welfare, of farmers in developing countries.

Table 12. Bangladesh: Impact of the European Union's Tariff Cuts on Bangladesh's
Non-Garment Exports to the European Union

(In thousands of 1993/94 U.S. dollars unless otherwise specified)

HS Code	Commodity Description	Exports Value 1993/94	Type of Trade	Pre-Round Tariffs (%)	Post-Round Tariffs (%)	Percentage Change in Price	Import Demand Elasticity	Percentage Change in Exports	Absolute Change in Exports
0306.23	Shrimp	96,093	Preferential	16.00	14.00	-1.7	-1.13	-1.9	-1,872
41.04	Leather	64,188	Preferential	7.00	6.50	-0.5	-1.58	-0.7	-474
53.07	Jute yarn and twine	40,264	Preferential	5.30	0.00	-5.0	-0.36	-1.8	-739
6305.10	Jute manufactures	34,952	Preferential	8.60	4.00	-4.2	-0.36	-1.5	-540
6302.21	Specialized textile and household linen	9,164	Preferential	13.00	12.00	-0.9	-0.36	-0.3	-30
64.05	Leather footwear	6,302	Preferential	7.31	5.64	-1.6	-0.76	-1.2	-75
5303.10	Raw jute	5,721	Preferential	0.00	0.00	0.0	-0.36	0.0	0
5703.9	Jute carpet	5,320	Preferential	14.00	8.00	-5.3	-0.36	-1.9	-102

Memorandum items:
Total non-garment exports   297,118

Total exports covered in analysis   262,004
of which:
Preferential exports   262,004
MFN exports   0

Increase in exports due to:
Preference erosion effect   -3,832
MFN tariff cut effect   0
Total effect   -3,832
(in percent of covered exports)   -1.46

Sources: Bangladesh Export Promotion Bureau; European Union's Uruguay Round Schedule of Commitments.

Table 13. Bangladesh: Impact of Japan's Tariff Cuts on Bangladesh's
Non-Garment Exports to Japan

(In thousands of 1993/94 U.S. dollars unless otherwise specified)

HS Code	Commodity Description	Exports Value 1993/94	Type of Trade	Pre-Round Tariffs (%)	Post-Round Tariffs (%)	Percentage Change in Price	Import Demand Elasticity	Percentage Change in Exports	Absolute Change in Exports
0306.23	Shrimp	22,301	Preferential	3.00	1.00	-1.9	-0.23	-0.4	-98
41.04	Leather	7,053	Preferential	19.13	10.86	-6.9	-0.32	-2.2	-155
63	Jute manufactures	6,334	Preferential	20.00	0.00	-16.7	-0.23	-3.8	-241
64.05	Leather products	5,456	Preferential	31.19	21.89	-7.1	-0.48	-3.4	-185

Memorandum items:
Total exports | 61,024

Total exports covered in analysis | 41,144
of which:
Preferential exports | 41,144
MFN exports | 0

Increase in exports due to:
Preference erosion effect | -678
MFN tariff cut effect | 0
Total effect | -678
(in percent of covered exports) | -1.65

Sources: Bangladesh Export Promotion Bureau; Japan's Uruguay Round Schedule of Commitments.

Table 14. Bangladesh: Impact of United States' Tariff Cuts on Bangladesh's
Non-Garment Exports to the United States

(In thousands of 1993/94 U.S. dollars unless otherwise specified)

HS Code	Commodity Description	Exports Value 1993/94	Type of Trade	Pre-Round Tariffs (%)	Post-Round Tariffs (%)	Percentage Change in Price	Import Demand Elasticity	Percentage Change in Exports	Absolute Change in Exports
0306.23	Shrimp	68,374	MFN	0.00	0.00	0.0	-1.13	0.0	0
6305.10	Jute manufactures	22,200	MFN	0.00	0.00	0.0	-1.14	0.0	0
53.07	Jute yarn and twine	8,661	Preferential	2.30	0.00	-2.2	-0.42	-0.9	-82
9506.31	Golf shaft	5,562	Preferential	4.90	4.40	-0.5	-0.76	-0.4	-20

Memorandum items:

Total exports 192,154

Total exports covered in analysis 104,797

of which:

Preferential exports 14,223

MFN exports 90,574

Increase in exports due to:

Preference erosion effect -102

MFN tariff cut effect 0

Total effect -102

(in percent of covered exports) -0.10

Sources: Bangladesh Export Promotion Bureau; U.S. Uruguay Round Schedule of Commitments.

with two counter-factual projections of net food imports in the year 2002 without the liberalization entailed by the Round.[26] Counter-factual Scenario I assumes that without the UR, protection in agriculture (defined in terms of applied tariffs and subsidies) over the period 1994-2002 would remain at the average level of the period 1982-93, whereas Scenario II assumes protection to remain at the average level of the period 1991-93. Protection in agriculture was higher on average in 1991-93 than in 1982-93, so estimated food price increases due to the Round are larger under Scenario II, since liberalization starts from a higher base (Table 15 gives the estimated price increases for the two scenarios from the Goldin and van der Mensbrugghe's study).

The results in Table 16 indicate that for the products covered by the analysis, the impact of the UR on the food imports bill is likely to be relatively minor. As a result of the Round, by 2002, net food imports will likely increase by $2.4 million (or 0.4 percent) under Scenario I, and by $12.7 million (or 2.1 percent) under Scenario II. In both scenarios, the increase stems mainly from changes in wheat prices which outweigh a small decline in the price of rice and edible oil. While these estimates will vary with the volume of food imports, particularly rice and wheat, the impact of the UR on Bangladesh's food import bill will be limited given the very modest changes in food prices as a result of the Round. Bangladesh's food import bill will depend more on factors such as weather conditions and the Government's agriculture policy than the UR.

4. Overall impact of the UR on the balance of payments

The effects of the UR on Bangladesh's balance of payments will be felt gradually with the implementation of the various provisions of the agreement. The various effects on exports and imports are summarized in Table 17 to illustrate the impact of the Round through the end of 2004, when all the elements of the Round are scheduled to be implemented.

Overall, it appears that during the transition period in which the MFA will be phased out, the UR is likely to have a positive impact on Bangladesh's balance of payments. This could translate into a net increase in exports of some $278 million, or about 1 percent of 1992 GDP, by the end of 2004. This positive effect will stem mainly from the increase in market access provided by the acceleration in the MFA quota growth rates, which more than offset the adverse impact of preference erosion and higher food prices. However, a larger market access is not a guarantee for sustained increases in exports of ready-made garments through 2004. In order to fully exploit this export opportunity, Bangladesh must--starting now, rather than waiting until quotas are fully eliminated--improve its competitiveness and supply capacity. In addition, policy measures directed at diversifying exports would be crucial for strengthening the balance of payments and reducing its vulnerability.

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[26]Differences in results between this analysis and the one by Eiteljörge and Shiells (1995) are minimal, and are explained mainly by differences in the assumptions and commodity coverage.

Table 15. Bangladesh: Impact of the Uruguay Round on World Agricultural Prices

(Percentage change from benchmark levels in 2002)

Commodity	Scenario I 1/	Scenario II 2/
Wheat	1.2	3.8
Rice	-1.5	-0.9
Coarse grains	0.1	2.3
Sugar	-1.0	1.8
Beef, veal and sheep meat	0.2	0.6
Other meats	-0.9	-0.6
Coffee	-1.7	-1.5
Cocoa	-1.3	-0.7
Tea	-1.6	-1.4
Oils	-0.6	-0.3
Dairy	-1.3	-1.4
Wool	-1.1	-0.9
Cotton	-1.3	-1.2
Other agricultural products	-0.5	0.8

Source: Goldin, I. and D. van der Mensbrugghe (1995), Table 3.

1/ Based on the assumption that future levels of protection (1994-2002) in the absence of the Uruguay Round would have been the 1982-93 average level of protection.
2/ Based on the assumption that future level of protection (1994-2002) in the absence of the Uruguay Round would have been the 1989-93 average level of protection.

Table 16. Bangladesh: Impact of the Uruguay Round on Net Food Imports

(In millions of U.S. dollars, unless otherwise specified)

	1993	2002
Baseline: with Uruguay Round 1/		
Imported food commodities		
Wheat	191.2	319.3
Rice	5.0	20.4
Edible oil	173.2	300.9
Sugar	13.2	54.0
Total	382.6	694.6
Exported food commodity		
Tea	39.5	74.9
Net food imports	343.1	619.7
Scenario I: Lower level of protection in the absence of the Uruguay Round		
Imported food commodities		
Wheat	191.2	315.5
Rice	5.0	20.7
Edible oil	173.2	302.7
Sugar	13.2	54.5
Total	382.6	693.4
Exported food commodity		
Tea	39.5	76.1
Net food imports	343.1	617.3
Incremental effect of the Round		2.4
(in percent of net food imports)		0.4
Scenario II: Higher level of protection in the absence of the Uruguay Round		
Imported food commodities		
Wheat	191.2	307.6
Rice	5.0	20.6
Edible oil	173.2	301.8
Sugar	13.2	53.0
Total	382.6	683.0
Exported food commodity		
Tea	39.5	76.0
Net food imports	343.1	607.0
Incremental effect of the Round		12.7
(in percent of net food imports)		2.1

1/ Based on the *World Economic Outlook* (WEO) projections of October 1995. Under Scenario I (II) it is implicitly assumed that the WEO projections incorporate the price changes due to the Uruguay Round that are based on the assumptions in Scenario I (II).

Table 17. Bangladesh: Summary Impact of the Uruguay Round on
the Balance of Payments by 2004 1/

(In millions of 1992 U.S. dollars)

I.	Increase in exports	
	● From MFA reform (by 2004)	296
	● From preference erosion (by 1999)	-5
	● From MFN tariff cuts (by 1999)	0
II.	Increase in imports	
	● From higher food prices (2002)	13
III.	Net effect	278
	(in percentage of 1992 GDP)	1

1/ As noted in the text, these estimates are purely illustrative, and should be interpreted
with caution.

D. Conclusion

The UR agreement will not have any substantial impact on the level of protection provided by Bangladesh's trade regime. Further liberalization of the trade regime should be pursued vigorously on a unilateral basis, particularly with respect to the reduction of the level and dispersion of tariffs, as well as early elimination of remaining trade-related nontariff barriers.

However, the conclusion of the UR provides Bangladesh with an opportunity to increase its exports, despite relatively minor adverse effects associated with preference erosion and higher food prices. In order to fully exploit this opportunity to enhance its growth prospects and reduce the vulnerability of its balance of payments, Bangladesh would need to increase its supply capacity and strengthen its competitiveness. Since most of the positive impact of the Round will result from increased exports of ready-made garments reflecting the market access security provided by the backloaded phase out of the MFA, it is crucial that necessary steps be taken to improve productivity in this sector, as well as diversify exports. In this regard, Bangladesh should very rapidly deepen and accelerate structural reforms, notably in the area of public enterprises, financial sector restructuring and further trade liberalization.

V. The Demand for Money in Bangladesh[27]

Since the mid-1980s, Bangladesh has been gradually liberalizing its financial system. Direct credit controls have ended and interest rate controls reduced. Bangladesh Bank's monetary program includes projections of broad money; a quarterly reserve money program was adopted in 1995. An important step in the process of moving to indirect monetary management is to estimate the demand for money, and such estimates will be of practical use only to the extent they are stable, demonstrating a predictable relationship between the demand for money and its determinants.

With the aim of better understanding the behavioral relationship underpinning the monetary programming exercise, this chapter presents estimates for money demand using conventional econometric approaches as well as a disaggregated error-correction model which allows for different elasticities for agricultural and nonagricultural income.[28] The note also explores the possibility of using the number of bank branches as an indicator of monetization, and alternative indicators of the opportunity cost of money. The results indicate that there is a stable relationship between real money, disaggregated income, interest rates, and the number of bank branches in the long run. When comparing the forecasting performances of various models, the error-correction model with disaggregation of income into agricultural and

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[27]Prepared by Sheila Bassett (SEA).

[28]The results presented in this paper are based on extensive work by Eric Sidgwick (SEA). The model for money demand, including disaggregated income, is based on Parker (1995).

nonagricultural components has somewhat better forecasting ability than the conventional models.

A. Trends in Monetary Aggregates and Policies

1. Trends in monetary aggregates

In the last two decades there has been a substantial increase in the demand for money, reflected in the sharp increase in the ratio of broad money to GDP (Chart 1). The most significant increase was registered in time deposits, as the ratios of narrow money and currency to GDP were relatively flat over the period. The rapid rise in money demand coincided with the increasing importance of industrial production--and a declining share of agriculture--as well as a sharp increase in the number of bank branches. The latter reflected the Government's aim of deepening financial intermediation and mobilizing savings, particularly in rural areas.

The sharp rise in the demand for money during the period 1976-1995, and the pronounced decline in the velocity of broad money--with a sharp fall in the currency-deposit ratio,[29]--reflected rapid monetization (Chart 1).[30] The increased use of currency and, in particular, deposits by an emerging business sector and by households that previously relied on subsistence production and barter trade, is a phenomenon typical of developing countries. The decline in the currency-deposit ratio contributed to the rise in the reserve money multiplier over most of the period, although an increase in the level of excess cash reserves held at Bangladesh Bank led to a sharp fall in the multiplier between 1992 and 1994.[31]

2. Monetary policy

Trends in monetary aggregates have been influenced by monetary policy reform measures in the past decade and a half. During the 1970s and early 1980s, policy was conducted via direct controls on credit and interest rates, and reserve and liquidity requirements. However, from the mid-1980s controls over interest rates and credit allocation were gradually relaxed. In 1987, credit ceilings on individual banks were eliminated; between

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[29]The currency-deposit ratio has been rising recently, however, which may reflect, in part, the reemergence of negative real interest rates.
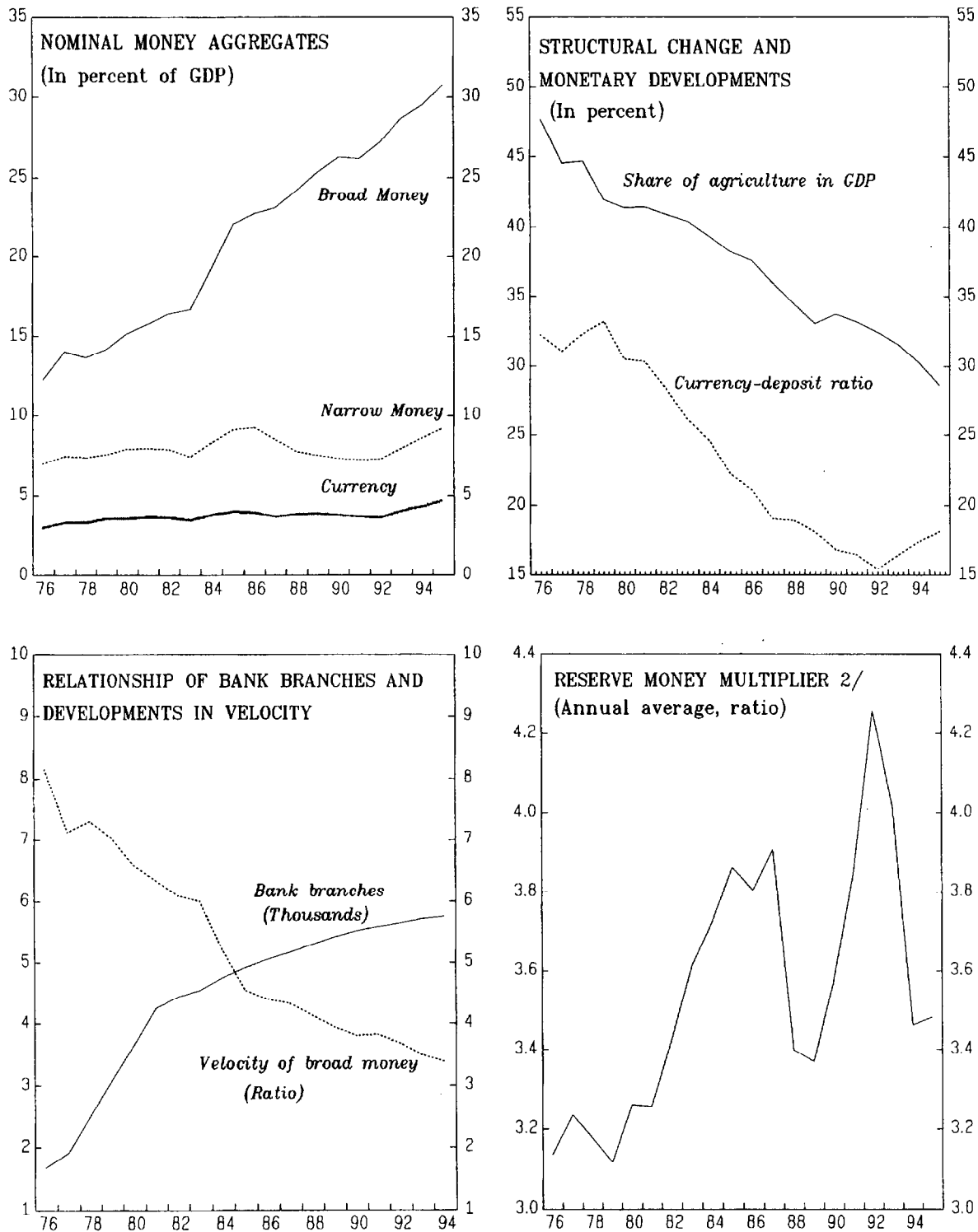
[30]See Bordo and Jonung (1987) for an investigation of the long-run behavior of the velocity of money which they established has a "U-shaped" pattern. In the first segment the monetization process results in a decline in velocity. After completion of the monetization process--when velocity flattens out--financial innovations and improvements in economic security produce rising velocity.

[31]Another sharp drop in the reserve money multiplier occurred in 1987 when the cash reserve requirement was raised from 5 to 10 percent.

CHART 1

BANGLADESH

Monetary Developments, 1976 - 1995 1/

NOMINAL MONEY AGGREGATES
(In percent of GDP)

Broad Money

Narrow Money

Currency

STRUCTURAL CHANGE AND MONETARY DEVELOPMENTS
(In percent)

Share of agriculture in GDP

Currency-deposit ratio

RELATIONSHIP OF BANK BRANCHES AND DEVELOPMENTS IN VELOCITY

Bank branches
(Thousands)

Velocity of broad money
(Ratio)

RESERVE MONEY MULTIPLIER 2/
(Annual average, ratio)

Sources: International Financial Statistics, IMF; Scheduled Banks Statistics, Bangladesh Bank; Bangladesh authorities.

1/ Fiscal years.

2/ The sharp declines in the reserve money multiplier in 1987/88 and between 1992 and 1994 were mainly due to a 5 percentage point increase in the cash requirement and a sharp increase in excess cash reserves, respectively.

late 1989 and early 1992, interest rates were largely liberalized;[32] and monetary policy instruments were streamlined and extended through the replacement of the refinance window by a rediscount window, and the introduction of 91-day Bangladesh Bank (BB) bills. Recently, the monetary authorities have relied more on indirect monetary instruments, i.e., changes in the bank rate (the rate at which banks can borrow from BB's rediscount facility), the sale of BB bills, and changes in the cash reserve requirement. In 1995 the frequency of BB bill auctions was increased to twice a month and auctioning of 90-day treasury bills was introduced.

One aim of financial reform was to make real interest rates positive and thereby encourage savings and financial deepening. Since the mid-1980s, interest liberalization measures resulted in a gradual increase in deposit rates. However, real interest rates remained negative until inflation began to decline in the latter part of the 1980s (Chart 2). The authorities also took measures to improve bank supervision, to develop capital markets, and to make the banking sector more competitive and responsive to market forces.

Financial reforms, in the long run, would be expected to enhance the effectiveness of monetary policy and lead to shifts in the level of money holdings and in income and interest elasticities of money demand.[33] These shifts can result in instability of money demand estimates over time. In the case of Bangladesh, financial liberalization was spread over a number of years and there is some evidence of discrete shifts in money demand.

B. Specification of Money Demand

A conventional money demand function--including a scale variable as an indicator of the level of transactions in an economy and a variable representing the opportunity cost of holding money balances (e.g., interest rates on alternative types of deposits or the expected inflation rate)--can be formulated in log-linear form as follows:

$$\ln m = \alpha + \beta \ln y + \gamma i \qquad\qquad \beta > 0, \gamma < 0 \qquad\qquad (1)$$

where m is the desired real money balances[34] in a steady-state situation, α is a constant, y is real income, and i represents the nominal interest rate. The income elasticity is equal to β and γ

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[32]Floors on deposit rates for savings accounts as well as fixed deposits--as well as bands for rates on lending to export, agriculture, and small and cottage industries--remain in effect.
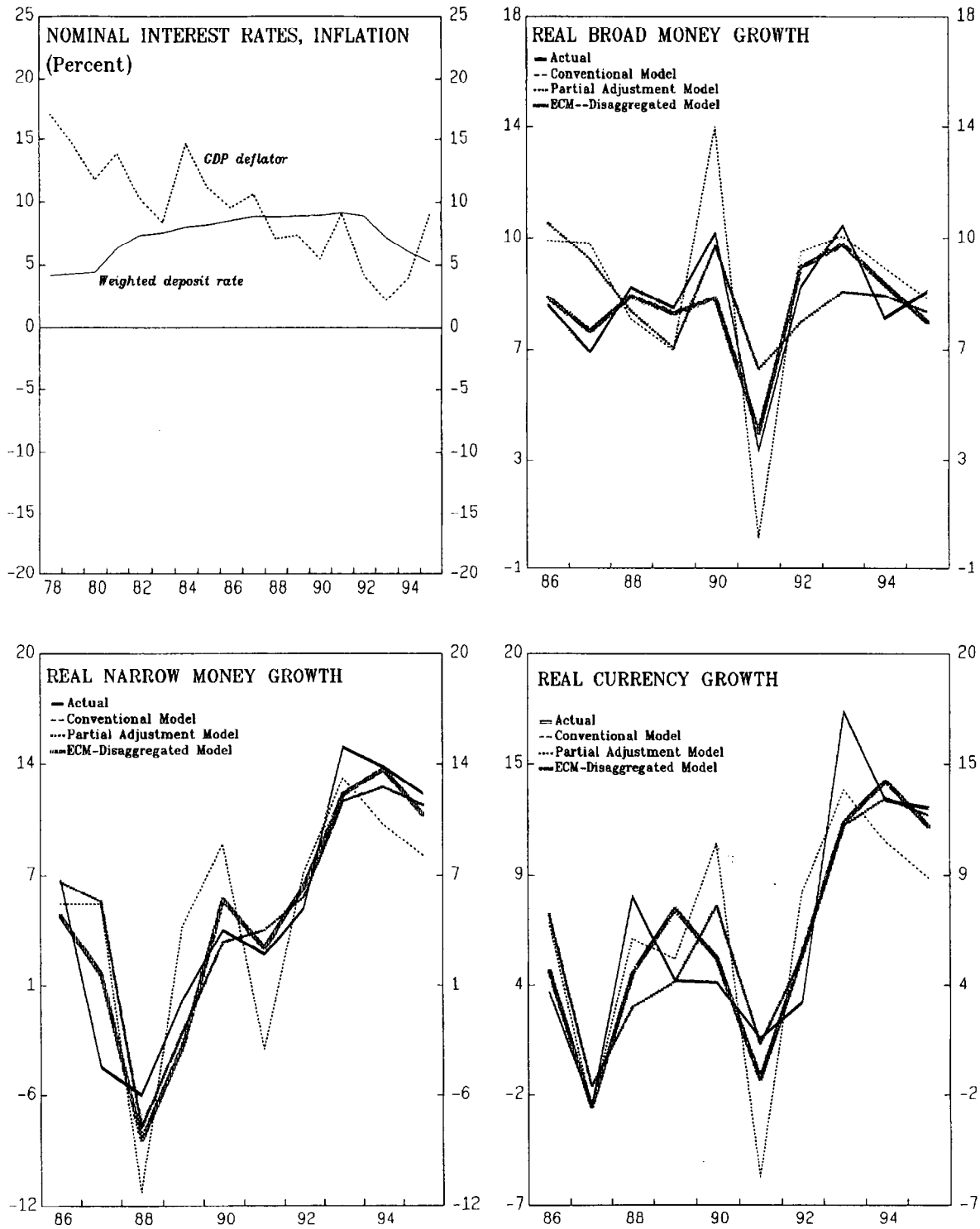
[33]See Tseng and Corker (1991), page 12.

[34]While in many empirical applications the demand for money is assumed to be homogeneous in prices, this hypothesis should in principle be tested (see Boughton (1991)).

CHART 2

BANGLADESH

Interest Rates, Inflation, and Simulation Experiments 1/

NOMINAL INTEREST RATES, INFLATION (Percent)

GDP deflator

Weighted deposit rate

REAL BROAD MONEY GROWTH
— Actual
-- Conventional Model
···· Partial Adjustment Model
— ECM--Disaggregated Model

REAL NARROW MONEY GROWTH
— Actual
-- Conventional Model
···· Partial Adjustment Model
— ECM-Disaggregated Model

REAL CURRENCY GROWTH
— Actual
-- Conventional Model
···· Partial Adjustment Model
— ECM-Disaggregated Model

Sources: International Financial Statistics, IMF; Scheduled Banks Statistics, Bangladesh Bank; Bangladesh authorities.

1/ Fiscal years. Dynamic simulation experiments begin in 1986.

measures the change in money demand when the nominal interest rate changes by 1 percentage point. The theoretical priors are that β is positive and γ is usually negative.[35]

Problems have been encountered with this simple conventional model, particularly in the case of developing countries, as it fails to take into account the process of financial deepening which often leads to shifts in the demand for money and hence unstable money demand equations. Excluding a proxy for this process would most likely lead to model misspecification and result in biased estimates of the income elasticity for money demand.[36]

To tackle this problem recent work has proposed alternative models. Arrau, et.al (1991) suggest the use of a time trend to capture the effects of financial innovation on money demand.[37] Recent work by Parker (1995) on India takes into account the long-term effect on money demand of monetization by differentiating between the agricultural and nonagricultural sectors. An increase in financial deepening would be associated with the structural transformation from an agrarian to an industrialized economy. The disaggregated model (in log-linear form) is as follows:

$$\ln m = \alpha + (1-\lambda)\,\beta \ln y + \lambda\,\beta \ln y_n + \gamma\,i + \theta \ln Br \qquad (2)$$

The model relates real money demand, m, to real income, y, and nonagricultural GDP, y_n.[38] The parameter λ is positively related to the extent of monetization of the agricultural sector relative to the nonagricultural sector, so that $\lambda=0$ would reduce to the conventional model implying the same monetization in both sectors, and $\lambda=1$ would indicate that demand is dominated by the nonagricultural sector and hence there is limited use of currency and financial instruments by farm households.

The number of bank branches, Br, is a scale variable which serves as an indicator of financial deepening, as the demand for money would increase with the availability of money and

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[35]Higher interest rates on time deposits induce a switch away from holding currency and narrow money. In the case of broad money, a higher interest differential on alternative assets would lower demand.

[36]See Arrau (1991) for a review of the failure of traditional approaches.

[37]A time trend was tried but it was found to be highly collinear with income and therefore was not used.

[38]To test the assumption of a coefficient of one on prices, equations were estimated using nominal money demand for each of the monetary aggregates, including the GDP deflator on the right-hand-side of the equation. The estimated elasticity for prices was close to one for broad money and currency, while narrow money was somewhat higher (1.4); however, the restriction was retained.

financial instruments. The number of bank branches would be expected to capture the effects of monetization and financial deepening not captured by λ in the disaggregated model. The expected sign of θ would depend on the monetary aggregate being estimated. However, a priori, an increase in the number of bank branches would be expected to increase the use of currency and financial instruments, although there might be some decrease in the demand for currency as people substitute away from holding cash and build up deposits. Over time, a greater number of bank branches, by increasing the opportunity for depositing funds, would increase the demand for narrow and broad money (financial deepening).

C. Data and Estimation Results

1. Data sources

Data were taken from the IMF's *International Financial Statistics* (IFS) for the main monetary aggregates (broad money, narrow money, and currency in circulation) on a monthly basis for the period 1975 to 1995; the monthly data were converted to fiscal years by averaging the twelve months in the fiscal year (July through June). Data for GDP, the GDP deflator, and the nonfood CPI were obtained from the authorities for the fiscal years covering the period 1972 to 1995.[39] In the case of currency and narrow money demand, the opportunity cost of holding cash was measured by a weighted deposit rate. For broad money, which includes time deposits, the three-month LIBOR on U.S. dollar deposits less the weighted deposit rate was used, where LIBOR would be the proxy for the return on alternative assets. The expected exchange rate depreciation was assumed to be zero. Data for the weighted deposit rate and the number of bank branches were obtained from Bangladesh Bank's *Scheduled Banks Statistics* for the period 1976 to 1993 and directly from the authorities for 1994 and 1995.

2. Time series properties of the data

Developments in econometric theory have led to increased attention to the time series properties of economic data. Because many time series exhibit a persistent tendency to increase or decrease over time (i.e., they are nonstationary), the traditional measures used for statistical inference may, in certain cases where stationary and nonstationary time series are combined, yield spurious results. Granger (1981) and others have shown that linear combinations of one or more nonstationary time series can turn out to be stationary; i.e., nonstationary variables can turn out to be cointegrated, thereby producing stationary residuals. Moreover, the presence of a cointegrated long-run equilibrium relationship between the variables allows the dynamic relationship to be represented in the form of an error correction model (ECM). The existence of a long-run relationship among a monetary aggregate and the determinants of money demand

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[39]Quarterly data for GDP were not available. An attempt was made to construct quarterly time series by interpolating annual data using exports and industrial production as indicator variables. However, preliminary estimation results were unsatisfactory and it was decided to proceed with annual data.

is investigated--after establishing that the variables have unit roots--by estimating money demand equations in level terms and testing the residuals for stationarity.[40]

The results of the Augmented Dickey-Fuller (ADF) unit root tests on the data are presented in Table 18.[41] They fail to reject the null hypothesis of unit root for the variables in level form. However, tests applied to the first difference of the variables reject the null hypothesis of a unit root, with the exception of the nominal weighted deposit rate, suggesting that all variables, except the interest rate variables, are integrated of order one (I(1)).[42, 43]

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[40]To say that a variable has a unit root is equivalent to stating that the variable is integrated of order one, I (1). Such a nonstationary variable Y_t can be written as $Y_t = \rho Y_{t-1} + u_t$, where $\rho = 1$ and $u_t \sim (0, \sigma^2)$ and is stationary.

[41]Unit root tests evaluate the hypothesis that $\rho = 1$ in the regression $Y_t = \beta_o + \rho Y_{t-1} + u_t$ where $u_t \sim (0, \sigma^2)$. In the Dickey-Fuller (DF) test, the equation is rewritten subtracting Y_{t-1} from both sides of the equation, $\Delta Y_t = \beta_o + (\rho - 1) Y_{t-1} + u_t$ where the null hypothesis is $(\rho - 1) = \beta_1 = 0$. Failure to reject the null is an indication that Y_t is nonstationary and will need to be differenced at least once to render it stationary. The distribution of the test statistic is a non-standard 't' statistic for which Fuller (1976) has tabulated the distribution. The standard DF test assumes that the data generating process is a first-order autoregressive process (AR(1)) under the null. If this is not in fact true, the autocorrelation in the error term will bias the test. To overcome this problem, the ADF test can be used to allow for the possibility of more dynamics in the above regression. The ADF test is a test of the null hypothesis that $\beta_1 = 0$ in the following regression: $\Delta Y_t = \beta_o + \beta_1 Y_{t-1} + \sum \gamma_j \Delta Y_{t-j} + u_t$ where the lag length j is set so as to absorb any correlation in ΔY, and the error term, u_t, is distributed as white noise. A time trend may also be included in these tests.

[42]The interest rate terms tend to move in discrete steps so it is difficult to discern the time series properties. However, cointegration was obtained in the long-run money demand equations, so they were retained in these equations.

[43]In the case of the data on the number of bank branches, ADF tests reject the null hypothesis of unit root in levels. However, visual inspection of the data (Chart 1) reveals that the series follow a logistic curve over the sample period, but after 1981 there is clear evidence of a linear trend, suggesting that it is nonstationary in levels. Also, given the relatively short span of the data, these tests may not be very powerful; it was found that increasing the number of lags on the first difference variables changed results in a number of cases. However, as noted later, excluding the number of bank branches in the narrow money and currency equations results in the rejection of the hypothesis that cointegration exists.

Table 18. Bangladesh: Tests for the Order of Integration of Real Money, Disaggregated Income, Interest Rates, and Number of Bank Branches[1]

	A.D.F. Statistic[2]	
	t_u (C, 2)	t_u (C,T,2)
ln M2	-0.42	-1.63
ln M1	0.16	-2.12
ln Cu	1.21	-1.86
ln Y	-2.15	-3.20
ln Y_n	-2.08	-5.00
i (M2) 3/	-1.82	-2.20
i (M1, Cu)	-2.07	0.43
ln Br[3]	-2.58*	-4.81***

	t_u (C, 1)	t_u (C,T,1)
Δln M2	-3.22***	-3.12*
Δln M1	-2.84**	-2.78
Δln Cu	-2.78*	-3.02
Δln Y	-3.81***	-4.96***
Δln Y_n	-3.94***	-4.71***
Δ i (M2)	-2.34	-1.98
Δ i (M1, Cu)	-1.48	-3.36**
Δln Br	-3.22**	-2.43

[1]Fiscal years from 1976 to 1995. ***,**,* indicates significance at the 1 percent, 5 percent and 10 percent level, respectively. Critical values are based on MacKinnon (1994). The null hypothesis is that there is unit root. Significance indicates that the null hypothesis is rejected.

[2]The Augmented Dickey-Fuller test statistics are presented with and without a time trend, t_u(C,n) and t_u(C,T,n), respectively, where "C" is a constant term, "T" is a time trend and "n" is the number of augmenting lags.

[3]i (M2) is the proxy for the opportunity cost of broad money (LIBOR minus the domestic weighted deposit rate); i (M1, Cu) is the proxy for the opportunity in cost of currency and narrow money (the domestic weighted deposit rate).

[4]Although the tests show that the series are stationary in levels, visual inspection of the data suggests that there is evidence that it is unit root over the period 1981 to 1995.

3. Cointegration tests

Having established the order of integration of the relevant variables, the next step was to test for the existence of a cointegrating relationship among the monetary aggregates and the determinants of money demand. The Engle and Granger (1987) two-step procedure is based on estimating the cointegrating vector using OLS and then carrying out a unit root test on the residuals to test for their stationarity to determine whether the variables are in fact cointegrated.[44] If the null hypothesis of unit root is rejected, i.e., the residuals are stationary, the second step involves estimating an error correction model (ECM) derived from equation (2) in which the lagged residuals of the first stage represent the error correction term.

The long-run money demand equations (equation (2) above) were estimated for each of the monetary aggregates using OLS and the results are reported in Table 19.[45] In addition to the interest rate terms, alternative proxies for the opportunity cost of money were also explored, including the inflation rate (nonfood CPI and the GDP deflator). Dummy variables to account for structural changes in money demand were included.[46] All regressions were run on fiscal years covering the period 1976 to 1995 assuming a log linear functional form. Engle-Granger tests indicated that there was a cointegrating relationship for broad money, narrow money, and currency with income, interest rates and bank branches.[47]

The estimated coefficients suggest that the income elasticity, β, is different for broad money and its components. The estimated income elasticity of currency and narrow money was less than or equal to one, while that of broad money (1.5) was lower than the estimate (2.0) using the conventional model in equation (1). The estimates for the income elasticity of

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[44]The Engle-Granger test for cointegration is an extension of the Dickey-Fuller unit root test on the regression residuals, after an initial cointegrating regression is run.

[45]Since, as noted earlier, t-statistics resulting from the OLS regression are meaningless for nonstationary variables, they are not shown in Table 19.

[46]For broad money, a dummy variable for 1976-83 was found to be significant. Stability tests carried out by Hossain (1993) suggested that the broad money demand equation might have become unstable after 1982 when financial reforms were accelerated. In the case of narrow money, an aberration in the data over the period 1984-87 required including a dummy variable for this period. Hossain (1993) also found instability in the narrow money equation for the period 1982-87. A dummy for 1984-86 was found to be significant for the currency equation. A dummy variable for 1991-95 was significant for all aggregates; in this period there were further moves toward indirect monetary policy instruments.

[47]As these tests are sensitive to the time span, plots of the residuals were also used to assess the results.

Table 19. Bangladesh: Cointegrating Relationship Between Real Money, Disaggregated Income, Interest Rates, and Number of Bank Branches

Engle-Granger procedure	Coefficient Estimates									D.W.	R^2	Engle Granger Statistic 5/
	α	$(1-\lambda)\beta$	$\beta\lambda$	β	λ^2	γ	θ	$D_1{}^3$	$D_2{}^4$			
Broad money (M2)	2.68	0.22	1.26	1.48	0.79	-0.004	0.02	-0.13	-0.03	2.03	0.99	-6.7***
Narrow money (M1)	4.76	-0.02	0.85	0.83	0.98	-0.04	0.16	0.17	-0.02	1.81	0.99	-4.8***
Currency (Cu)	4.39	-0.63	1.51	0.98	1.54	-0.03	0.11	0.09	-0.04	1.78	0.99	-4.9***

[1]Fiscal years from 1976 to 1995 estimated using OLS regression. ***,**,* indicates significance at 1 percent, 5 percent, and 10 percent levels, respectively.

[2]The income elasticity (β) is derived as the sum of the elasticity of real GDP (($1-\lambda$) β) and nonagricultural GDP (λ β) which were estimated using OLS. The estimate λ was derived by dividing the elasticity for nonagricultural GDP (λ β) by the estimate for β .

[3]Dummy for broad money (1976-83 =1), for narrow money (1984-87=1), for currency (1984-86=1).

[4]Dummy for all money aggregates, (1991-95=1; 0 elsewhere).

[5]Engle-Granger statistic is an extension of the Dickey-Fuller unit root test on the residuals after an initial cointegrating regression.

currency and narrow money in the disaggregated model are also well below those of the conventional model (Table 20).

The estimates for λ were non-zero for the three monetary aggregates.[48] In the case of currency and narrow money, nonagricultural GDP was a better measure of the scale variable for transactions.[49] However, in the case of broad money both sectors are important in determining the income elasticity, suggesting that time deposits are influenced by developments in the agricultural sector.[50]

Based on these estimates, the number of bank branches appears to play a role in determining demand for each of the monetary aggregates, indicating that it is important in capturing the effects of financial deepening.[51]

The opportunity cost variable as measured by the difference between LIBOR and the weighted deposit rate on time deposits in the case of broad money,[52] and the weighted

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[48]OLS estimates of the parameters of the cointegrating vector cannot be used to test hypotheses about the cointegrating vector unless the effect of additional "nuisance" parameters is taken into account, as noted in Campbell and Perron (1991). At present, there are not enough degrees of freedom in the sample period to include these nuisance parameters in the OLS regression. Alternatively, one could enter the lagged values of the variables in equation (2) directly in the ECM instead of the lagged residuals. This would again pose degrees of freedom problems. However, economic priors would support estimates of λ close to one, as empirical evidence suggests that the agricultural sector in Bangladesh is not highly monetized.

[49]In the case of currency, the estimates included an implausible value for λ exceeding 1. This suggests that there is a misspecification of the currency demand equation and that there are other factors which may explain its behavior, such as macroeconomic instability. However, the value of λ is not of primary importance as we are attempting to ascertain the underlying elasticity of income.

[50]Data as of March 1994 from Bangladesh Bank's *Scheduled Banks Statistics* show that the share of agriculture in total deposits was about 8 percent while agriculture in GDP is about 30 percent, suggesting that agriculture is significantly less monetized than other sectors in the economy. About 90 percent of the deposits of the agricultural sector are classified as time deposits, mostly savings deposits (15 percent of which are regarded as demand deposits).

[51]Excluding the number of bank branches in the narrow money and currency equations resulted in rejection of the hypothesis that cointegration exists.

[52]This was used as a measure of alternative assets in the absence of a better measure. LIBOR was also used in a number of cases in Tseng and Corker (1991). Since capital controls have been in place in Bangladesh for most of the period, the effect of this interest differential on money demand would be expected to be small.

Table 20. Bangladesh: Elasticities of Alternative Scale Models

	Disaggregated Model	Conventional Model	Parital Adjustment Model
Broad money (M2)	1.48	2.04	1.80
Narrow money (M1)	0.83	1.36	1.32
Currency (Cu)	0.98	1.60	1.69

deposit rate on time deposits alone for narrow money and currency were cointegrated with the respective money aggregates and had the correct sign for the three monetary aggregates. In general, it was found that these variables performed better than inflation rate (the GDP deflator and the nonfood CPI) when used as a measure of the opportunity cost of money.

4. Error correction model for money demand

The next step in the estimation procedure was to use the lagged residuals from the long-run specification as the error correction term in a dynamic specification of the demand for real broad money and the other monetary aggregates.[53] An initial specification used one lag for each variable in difference form and the lagged error correction term from the long-run equation (Table 21).[54]

The t-statistics on the error correction terms suggest that they are significant, supporting the findings of the Engle-Granger tests for cointegration performed earlier. As shown in Table 21, the broad money and narrow money equations have a coefficient on the error correction term of one, implying that the adjustment to the long-run occurs entirely in one year.

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[53]If a set of variables is cointegrated, there exists a valid error-correction representation of such a relationship. This is the so-called Granger Representation Theorem (see Granger 1987).

[54]A parsimonious form could be achieved by eliminating the insignificant variables in a step-by-step approach. However, when a variable is dropped, the significance of the remaining variables will change, and the order in which variables are eliminated may affect the final form of the equation.

Table 21. Bangladesh: Error-Correction Models of Money Demand[1]

	$\Delta\ln M2$	$\Delta\ln M1$	$\Delta\ln Cu$
$\Delta\ln M_{-1}$	0.33 (5.9)	0.34 (4.1)	0.18 (1.2)
$\Delta\ln Y$	-0.04 (0.2)	0.25 (0.6)	-0.56 (0.9)
$\Delta\ln Y_n$	0.72 (4.0)	0.12 (0.2)	1.64 (3.8)
ΔI	0.01 (3.7)	-0.03 (3.0)	-0.02 (1.7)
$\Delta\ln Br$	-0.08 (2.2)	-0.02 (0.2)	-0.01 (0.1)
EC(-1)	-1.00 (7.2)	-0.80 (4.4)	-1.00 (3.3)
ΔD_1	-0.10 (8.0)	0.12 (6.9)	0.09 (4.4)
ΔD_2	-0.05 (4.0)	-0.04 (1.5)	-0.04 (1.4)
Const.	0.02 (1.6)	0.02 (0.8)	-0.01 (0.5)
R^2	0.96	0.92	0.86
Durbin's h-statistic	-0.58	-1.82	-0.33

[1]Fiscal years covering the period 1977 to 1995.

The dynamic forecast values for the error correction models are shown and compared with the actual data for the monetary aggregates (Chart 2). For purposes of comparison, a conventional money demand equation was estimated as shown in equation (1) above, as well as a partial adjustment model (the conventional model with a lagged dependent variable). In general the error correction models performed better.

The equations were tested for parameter stability using recursive regressions. In general, tests on the parameters suggest that the estimates for the income and interest rate parameters for broad money and narrow money were stable. However, in the currency equation the interest rate coefficient shifted from a positive to negative sign in the final years of the estimation period. This adds further evidence that there may be a missing explanatory variable in this specification.

D. Conclusions

This paper presented an error correction model for real broad money which showed a stable long-run relationship between real money balances, disaggregated income, interest rates, and bank branches. The long-run model for broad money, using disaggregated GDP, results in an estimate for the income elasticity which exceeds unity, approximately 1.5, but which is close to the value used in current empirical work and is lower than estimates using the conventional model.[55] The estimate for the income elasticity also compares with those for other countries (Table 22). In the case of the other real money aggregates, narrow money, and currency, the estimated income elasticities using the disaggregated model are consistent with economic priors and are less than or equal to 1. However, in the case of the demand for currency, the parameter estimates of the degree of monetization of the agricultural sector were implausible suggesting that the currency equation is misspecified and that other factors, such as macroeconomic instability, may play a role.

In simulation experiments, it was also found that the disaggregated error correction model performed better than the conventional model. It was also determined that the broad money and currency error correction models adjusted to the long-run coefficients in one year.

While it is encouraging to find that there is a relationship between real money balances, disaggregated income, interest rates, and bank branches, forecasting performance suggests that there is room for further improvement. Furthermore, the model needs to be expanded to quarterly data to assist in quarterly financial programming. Given recent financial reforms and the extensive reform efforts underway, the estimates will need to be reexamined frequently to improve estimates of money demand and thereby assist financial programming.

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[55]This is also consistent with ongoing work on estimating money demand on a quarterly basis.

Table 22. Bangladesh: Comparisons of Estimated Income Elasticities
for Broad Money

	Income elasticity	Country
Kabir (1992)	1.84	Bangladesh
Parker (1995)	1.31	India
Tseng and Corker (1991)	1.22	Sri Lanka
Tseng and Corker (1991)	1.43	Myanmar
Tseng and Corker (1991)	1.58	Indonesia
Tseng and Corker (1991)	1.47	Philippines

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