

STRUCTURAL CHANGE AND DYNAMICS OF LABOR MARKETS IN BANGLADESH

Studies on Labor and Employment

*Edited by
Selim Raihan*

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SOUTH ASIAN NETWORK ON ECONOMIC MODELING

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Preface

Bangladesh's achievement in economic growth over the last one decade has been quite robust. The country has recently been upgraded from low income country (LIC) to lower-middle income country (LMIC) as per World Bank's classification. There is an aspiration of graduating from the LDC status to middle income country by 2021 as per the United Nations' classification. The 7th five year plan sets the target of 8 percent GDP growth rate by 2020. This requires a huge leap forward from the current level of 6 percent average growth rate. The situation also demands for a considerable structural change in the economy leading to large scale economic diversification, promotion of labor-intensive and high-productivity sectors, both in farm and nonfarm sectors, and interventions to enhance productivity, jobs and incomes in traditional and informal activities where there are large pools of surplus labor.

Against this backdrop, South Asian Network on Economic Modeling (SANEM) is happy to offer the volume titled ***Structural Change and Dynamics of Labor Markets in Bangladesh: Studies on Labor and Employment***. This publication is a compilation of the papers produced under a research project titled "Changing Labor Markets in Bangladesh: Understanding Dynamics in Relation to Economic Growth and Poverty", sponsored by the International Development Research Center (IDRC), Canada.

This volume covers a wide range of issues related to labor markets in Bangladesh. These include structural change and employment creation, factors affecting the choice between farm and nonfarm employments, employment status and wellbeing of rural households, factors influencing female labor force participation, unpacking unpaid family labor, dynamics of employment in the urban informal sector, social protection programs impacting on labor force participation behavior, impact of both international and internal remittances on the domestic labor market, some estimates of the first demographic dividend in Bangladesh, role of education and skill development in the transition from 'good-enough' job to 'decent' job, issue of agricultural seasonality in skill training, and policy simulations using social accounting matrix and computable general equilibrium frameworks.

We wish to extend our sincere gratitude to IDRC, Canada for their financial support to successfully publish this volume. It is our pleasure to thank Edgard Rodriguez, from the IDRC, Canada, for his support and advice. We are pleased to recognize the contributions from authors and co-authors of chapters in this volume. The list includes Selim Raihan, Bazlul Haque Khondker, Simeen Mahmud, Sayema Haque Bidisha, Abu Parves Shonchoy, Nafiz Ifteakhar, Mir Tanzim Nur Angkur, Muhammad Moshir Rahman, Fatima Tuz Zohora, Syer Tazim Haque, Israt Jahan, Mahtab Uddin and Andilip Afroze.

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Abbreviations

APS	<i>Average Propensities to Spend</i>
BA	<i>Bachelor of Arts</i>
BBS	<i>Bangladesh Bureau of Statistics</i>
BIHS	<i>Bangladesh Integrated Household Survey</i>
CES	<i>Constant Elasticity of Substitution</i>
CET	<i>Constant Elasticity of Transformation</i>
CFW	<i>Cash for Work</i>
CGE	<i>Computable General Equilibrium</i>
ECI	<i>Economic Complexity Index</i>
ESR	<i>Economic Support Ratio</i>
EU	<i>European Union</i>
FDI	<i>Foreign Direct Investment</i>
FE	<i>Fixed Effect</i>
FFW	<i>Food for Work</i>
GDP	<i>Gross Domestic Product</i>
GFCF	<i>Fixed Capital Formation</i>
GR	<i>Gratuitous Relief</i>
GSP	<i>Generalized Systems of Preference</i>
HIES	<i>Household Income and Expenditure Survey</i>
HSC	<i>Higher-Secondary School Certificate</i>
IFPRI	<i>International Food Policy Research Institute</i>
ILO	<i>International Labor Organization</i>
I-O	<i>Input Output</i>
IV	<i>Instrumental Variable</i>
LCD	<i>Life-Cycle Deficit</i>
LFP	<i>Labor Force Participation</i>
LFPR	<i>Labor Force Participation Rate</i>
LFS	<i>Labor Force Survey</i>
LIC	<i>Low Income Country</i>
LMIC	<i>Lower-Middle Income Country</i>
LPM	<i>Linear Probability Model</i>
MFA	<i>Multi Fibre Arrangement</i>
MICE	<i>Multiple Imputations by Chained Equations</i>
NGO	<i>Non-Government Organization</i>
NSSS	<i>National Social Security Strategy</i>
NTA	<i>National Transfer Account</i>
OECD	<i>Organization for Economic Co-operation and Development</i>
OLS	<i>Ordinary Least Square</i>
OPS	<i>Open market sales</i>
PEP	<i>Partnership for Economic Policy</i>
PSU	<i>Primary sampling unit</i>

<i>RE</i>	<i>Random Effect</i>
<i>RMG</i>	<i>Readymade Garments</i>
<i>RR</i>	<i>Relative Risk</i>
<i>RRR</i>	<i>Relative Risk Ratio</i>
<i>SAM</i>	<i>Social Accounting Matrix</i>
<i>SNA</i>	<i>System of National Accounts</i>
<i>SNA</i>	<i>National Accounts Statistics</i>
<i>SSC</i>	<i>Secondary School Certificate</i>
<i>TFR</i>	<i>Total Fertility Rate</i>
<i>UN</i>	<i>United Nations</i>
<i>UNDP</i>	<i>United Nations Development Program</i>
<i>UNFPA</i>	<i>United Nations Population Fund</i>
<i>VGD</i>	<i>Vulnerable Group Development</i>
<i>VGf</i>	<i>Vulnerable Group Feeding</i>
<i>WSD</i>	<i>widowed/separated/divorced</i>

Key Messages

1. Bangladesh economy has undergone significant structural changes over the last four decades. The share of agriculture in GDP has declined, while the relative significance of industry and service sectors has increased. These structural changes have been associated with both positive trends and persistent employment challenges such as lack of diversification, poor working conditions, low productivity and a high degree of informality.
2. Economic diversification can play an important role in the structural transformation of the economy from producing low value-added products to high value-added products. Promotion of labor-intensive and high-productivity sectors, both in the farm and nonfarm, is therefore fundamental. This should be coupled with interventions to enhance productivity, jobs and incomes in traditional and informal activities where there are large pools of surplus labor.
3. However, strategies specified in the different policies in Bangladesh for economic and export diversification lack clear guidelines as regards to implementation, and therefore, result in ineffective strategies. In case of export diversification, it has been a matter of serious concern that though there are significant incentives provided to the export sector in Bangladesh, there is formidable difficulty in actually accessing such incentives and they helped little in diversifying the export basket. Furthermore, though the latest industrial policy identifies a number of high priority and priority sectors for economic diversification, there are several policy-induced and supply-side constraints that have constricted the development of these sectors. Unless and until these policy-induced and supply-side constraints are addressed, the agenda for further productive economic diversification will remain unfulfilled.
4. Major supply side constraints include poor physical infrastructure, inefficiencies at ports and related internal road transportation, lack of investment fund and working capital, high interest rate, shortage of skilled workers, technological bottlenecks, lack of entrepreneurial and management skills, and very high invisible costs of doing business.
5. In the discourse on infrastructure and economic growth the dominant area of discussion is on the quantity and quality of infrastructure and how countries differ in these respects. While most of the countries emphasize a lot on investing in raising the quantity (and quality) of infrastructure, there is a fundamental concern whether rising supply of infrastructure ensures the access to infrastructure. This problem is manifested through the fact that due to a variety of reasons enhanced supply of infrastructure may not solve the problem of 'entitlement failure' in terms of effective access to infrastructure, as the people/sectors in dire need of improved infrastructure may not have the access even with an increased supply.
6. Some of supply-side constraints related to weak infrastructure in Bangladesh are broadly 'general' in nature and some are critically 'sector-specific'. Yet, policymakers are so inclined to improvement in the broad general infrastructure, i.e., enhanced supply of electricity, improvement in roads, improvement in port facilities, etc. that the developments of critical sector-specific infrastructure are largely overlooked. Embarking on developing broad general infrastructure are relatively easy, whereas solving sector-specific infrastructure problems involve identifying priorities in the policy making process and addressing a number of political economic issues. Failure to deal with sector-specific infrastructure problems leads to a scenario where a large number of potential inclusive-growth enhancing sectors fail to enjoy the benefit from the improvement in broad general infrastructure, and thus end up with 'entitlement failure'.

7. Manufacturing is now an overwhelmingly salient component of Bangladesh's export composition, thanks largely to the rapid expansion of the garments industry. Garments has been an important contributor to growth and employment generation in Bangladesh. However, the garments industry of Bangladesh is now at a crossroad. There have been concerns with regard to compliance issues and work place safety in the garments industry in Bangladesh, and, in the last few years, these issues have become very critical for the future of this industry. These concerns should be addressed in a positive way as an opportunity to build industry's reputation in the global market. In this context, issues like wage, workplace security, fringe benefits, workplace environment etc. need to be resolved on a priority basis. In addition, there is a critical need for enhancing labor productivity, moving up to the higher value-added products through introducing new technology along the production line spurring innovation, and enhancing Bangladesh's competitiveness by reducing the cost of doing business.
8. As far as economic diversification is concerned, productive rural nonfarm sector can be very instrumental. Rural nonfarm sector also has a crucial role in reducing poverty and increasing the wellbeing of rural households. Education, improvement in rural infrastructure and development of productive rural nonfarm sectors provide positive stimulus to raise employment in the rural nonfarm sectors.
9. The rate of female labor force participation in Bangladesh is still very low. Evidence suggests that female labor force participation reduces the likelihood of household poverty; and resources in female's hands have a range of positive outcomes for human capital and capabilities within the household. Thus, there is a strong rationale for ensuring female participation in the economy's growth process. Education, skill development, public and private sector initiatives in investment in the care economy as well as different social protection programs can be very useful in increasing female labor force participation.
10. 'Decent' job should be regarded as a dynamic and progressive phenomenon. There could be three stages for moving towards 'decent' job. The first stage is the 'good-enough' job, which shows the transition from 'no job' to 'job' or from unpaid family job to paid-job. The second stage is the 'good' job, which shows the transition from 'good-enough' job to job with better return, formal job security and enhanced workers' rights. The third stage is the 'decent' job, which is the transition from 'good' job to a state of productive employment in compliance with agreed international standards of working environment and workers' rights.
11. The economic growth process in Bangladesh, over the past two decades, has been in a position to generate employment in agriculture, rural non-farm sector, urban informal sector, and the urban formal sector, mostly in garments. Apart from garments, employment in all other sectors has largely been for males, mostly informal in type. The nature of these jobs has been largely 'good-enough'. Rise in employment in agriculture, both in the crop and non-crop sectors, has been associated with virtually no progress towards 'good' job. Rises in employment in the rural non-farm and urban informal sectors have also happened without much progress towards the creation of 'good' jobs in these sectors. For males, such expansion has helped moving out from unemployment or unpaid family labor to 'good-enough' jobs. For females, employment in the garments sector, in most cases, is a manifestation of the transition from no labor force participation or unpaid family jobs to paid-jobs. Such paid-jobs in most of the garments factories are largely 'good-enough' in nature. All these suggest that, jobs in Bangladesh are pre-dominantly 'good-enough' in nature.
12. In the near future, for the promotion of inclusive growth, the challenge of the Bangladesh economy, as far as the quality of employment is concerned, is how to make a transition from the current state of 'good-enough' jobs to large scale 'good' jobs. In the medium to long term, the prospect of inclusive growth in Bangladesh would depend on how the growth momentum would be able to generate successful transition towards a state of 'decent' job.
13. Imposition of terms and conditions for 'decent job' agenda may not be enough in promoting 'decent job' as the workers may themselves lack the quality to be absorbed in the transformation process due to their

lower productivity. Hence, supply side policies like spreading education and skill development programs to the mass population, removing socio-economic barriers over educational attainments, and enhancing the diversity of training programs, taking into consideration domestic as well as global labor market demands, should be adapted. Most importantly, to ensure the proper escalation of labor productivity – emphasis must be on the improvement of the quality of education and training as well.

14. The critical issue of local agricultural seasonality should be taken into consideration for any typical skill-development training program. As socio-economic attributes of participants systematically vary during the period of seasonality than normal time, understanding the seasonality and adequately addressing this into the design of the program is warranted to achieve a targeted population. Otherwise, programs will face issues like mis-targeting, attrition and drop-outs.
15. Bangladesh is passing through a critical phase of demographic dividend. However, the country is still far from making the best use of it. For making the best use of the demographic dividend, the critical policy areas should include investment on youth development, expanding access to family planning, investment in infrastructure, public health, education, especially female education and skill development. In addition, decisive policy emphasis should be on promoting both labor-intensive and skill intensive jobs, savings and openness to trade and foreign investment.
16. For further economic growth acceleration and employment generation in Bangladesh, there is a need for reforms in policies and institutions. This will require increased domestic private investment and foreign direct investment targeting broader economic and export diversification. Emphasis should be not only on raising the level of investment but also on the efficiency of investment through removal of a number of supply side bottlenecks in the economy. There is a need for a new paradigm of macro, trade and investment policies with effective and time-bound support to emerging dynamic sectors.
17. There is a need for a well-designed and effective industrial policy wherein monetary and fiscal incentives for the emerging dynamic sectors should be transparent and time-bound. In addition, industrial policy needs to address issues of education and skill development for facilitating higher capabilities for economic diversification, attracting FDI and integrating with the global value chain.
18. Institutional reforms should be considered as a key to overall policy reforms. Improving the bureaucracy quality, ensuring property rights, managing corruption, ensuring contract viability through reduction of the risk of contract modification or cancellation are examples of such institutional reforms. Furthermore, reducing political uncertainties or establishing political stability and generating political capital for economic diversification are critically important.

Structural Change in Bangladesh: Challenges for Growth and Employment Creation

Selim Raihan

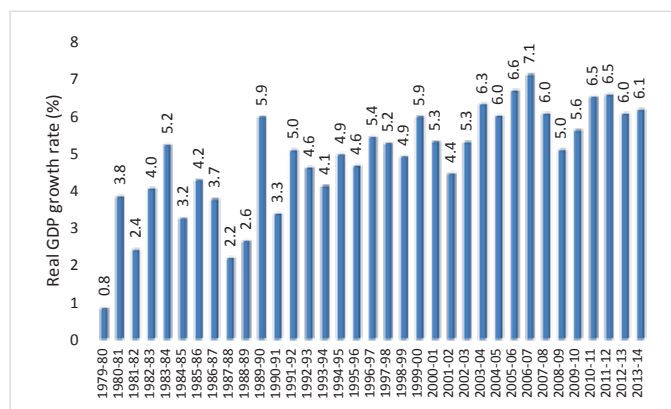
Introduction

Bangladesh economy has undergone significant structural changes over the last four decades. The share of agriculture in GDP has declined from over 60 percent to less than 20 percent, while the relative significance of industry (including manufacturing), currently estimated to be 28 percent of GDP, and service sectors has increased substantially. The composition of the manufacturing sector during the 1990s and 2000s has become increasingly readymade garments (RMG) oriented. Driven by the expansion of the RMG industry, the share of employment in the manufacturing sector in Bangladesh rose from 9.5 percent in 1999-00 to 16.4 percent in 2013. As found in all low-income countries, the unemployment rate does not accurately capture deficiencies in the labor market (the rate was just 4.3 per cent in 2013). Rather, the majority of workers are found in informal employment and suffer from under-employment. Gender disparities persist despite the rise in the share of female workers. In summary, robust economic growth in Bangladesh has been associated with both positive trends and persistent employment challenges such as lack of diversification, poor working conditions, low productivity and a high degree of informality. Against this backdrop, this paper analyses the nature of structural transformation in Bangladesh and elaborates on the major challenges for future growth acceleration and employment creation.

The Nature of Structural Transformation in Bangladesh

Over the past four decades, notwithstanding many external and internal shocks, Bangladesh has increased its per capita income by four-fold. As shown in Figure 1.1, Bangladesh has been able to maintain healthy rates of growth in real GDP during 2000s and first half of 2010s. Bangladesh's economic growth rates in recent years (more than 6 percent) have been higher than most of the South Asian countries and many of the sub-Saharan African countries. Such economic growth has been associated with some important structural changes in the economy.

Figure 1.1: Real GDP growth rate

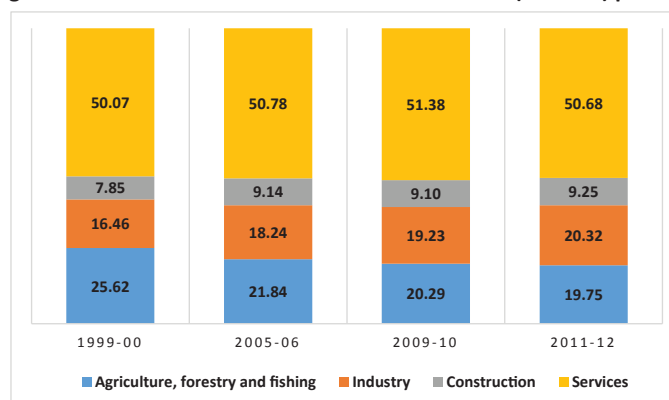


Source: World Bank, WDI

Structural change of the economy is the shift in resources from the less productive sectors of the economy to the more productive sectors, diversification and sophistication of production and exports, and discovery of new products (Felipe, 2009). There have been some significant structural transformations in the Bangladesh economy in recent decades. Figure 1.2 shows that the share of agriculture, forestry and fishing in GDP declined from 25.6 percent in 1999-2000 to 19.75 percent in 2011-12. The share of industry increased from 16.5 percent to 20.3

percent during the same period. While the share of construction increased from 7.9 percent to 9.3 percent, that of the service sector remained little over 50 percent during this period.

Figure 1.2: Broad sectoral shares of GDP at constant (1995-96) prices (%)



Source: Author's calculation from the National Accounts data of BBS

Table 1.1 presents the changes in the sub-sectoral shares of GDP during 1999-00 and 2011-12. Among the manufacturing sub-sectors, the sectors which have increased their shares over time are textile and wearing apparels, chemical, rubber and plastics, and other manufacturing involving mainly the small scale industries. However, manufacturing sub-sectors such as food and beverage, tobacco, leather and footwear, and printing and publishing experienced fall in their shares. Shares of sub-sectors like petroleum and petroleum products and metal and mineral products remained stable. In case of services, most of services sub-sectors, except financial intermediation, real estate and other business activities, and other service activities, experienced rise in their shares during the same period.

Table 1.1: Sub-sectoral shares of GDP at constant (1995-96) prices (%)

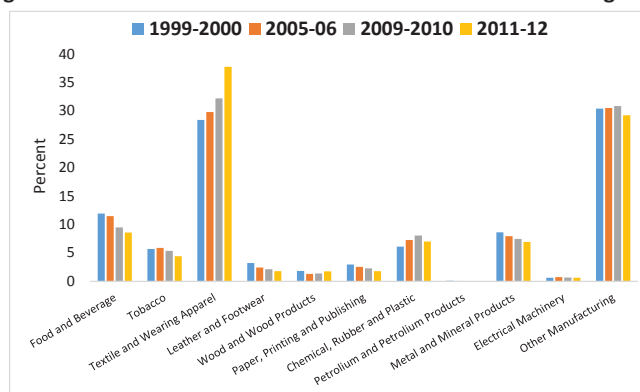
Sub-sector	1999-00	2005-06	2009-10	2011-12
Agriculture, forestry and fishing	25.62	21.84	20.29	19.75
Mining and quarrying	1.03	1.16	1.29	1.26
Food and beverage	1.84	1.96	1.70	1.64
Tobacco	0.88	1.01	0.96	0.85
Textile and wearing apparel	4.38	5.09	5.78	7.20
Leather and footwear	0.50	0.41	0.38	0.34
Wood and wood products	0.29	0.22	0.25	0.33
Printing and publishing	0.46	0.44	0.41	0.35
Chemical, rubber and plastic	0.95	1.24	1.45	1.34
Petroleum and petroleum products	0.01	0.01	0.01	0.00
Metal and mineral products	1.33	1.36	1.34	1.32
Electrical machinery	0.10	0.13	0.12	0.12
Other manufacturing	4.69	5.21	5.53	5.57
Construction	7.85	9.14	9.10	9.25
Electricity, gas, water and waste management	1.44	1.65	1.60	1.72
Trade, hotel and restaurants	14.01	14.77	15.09	14.96
Transportation, storage and communication	9.22	10.07	10.79	10.70
Financial intermediation, real estate and other business activities	11.28	10.31	9.79	8.90
Public administration and defense	2.55	2.71	2.84	2.91
Education	2.21	2.49	2.71	2.83
Human health and social work activities	2.20	2.27	2.38	2.45
Other service activities	7.17	6.52	6.17	6.21
Total	100.00	100.00	100.00	100.00

Source: Author's calculation from the National Accounts data of BBS

Within the manufacturing sector, the shares of different sub-sectors in the manufacturing GDP are presented in Figure 1.3. It is obvious that during 1999-00 and 2011-12, the major gainer has been the textile and wearing apparel sub-sector, which by 2011-12 increased its share of the manufacturing GDP to 37.8 percent from 28.4 percent in 1999-00. The rise in the share of textile and wearing apparel sub-sector during 2009-10 and 2011-12

has been quite remarkable, as its share increased by more than 5 percentage points during that short span. While chemical, rubber and plastics, electrical machinery and other manufacturing could increase their shares by some margins during 1999-2000 and 2009-10, all other sub-sectors experienced fall in shares during that period. During 2009-10 and 2011-12, all manufacturing sub-sectors, except textile and wearing apparel, experienced fall in their shares in the manufacturing GDP. This suggests that over the years, in terms of sub-sectoral shares in value-addition, the manufacturing sector has become more and more concentrated around the textile and wearing apparel sector.

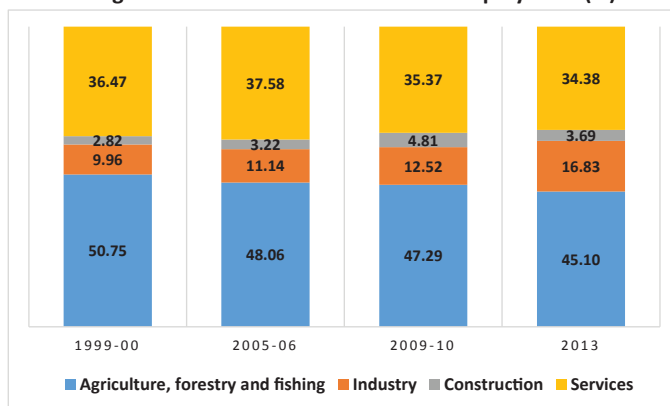
Figure 1.3: Shares of different sub-sectors in the manufacturing GDP (%)



Source: Author's calculation from the National Accounts data of BBS

In terms of the share in employment, quite a reverse picture emerges. Figure 1.4 shows that the combined share of agriculture, forestry and fishing in 2013 was still quite high (45.1 percent) which however declined from more than 50 percent (50.8 percent) in 1999-00. Industry's share in total employment increased from around 10 percent in 1999-00 to 16.8 percent in 2013. The share of construction sector also increased quite significantly during 1999-00 and 2009-10 (from 2.8 percent to 4.8 percent) but declined to 3.7 percent in 2013. The share of services sector however declined from 36.5 percent to 34.4 percent during 1999-00 and 2013.

Figure 1.4: Broad sectoral shares of employment (%)



Source: Author's calculation from the Labor Force Survey data

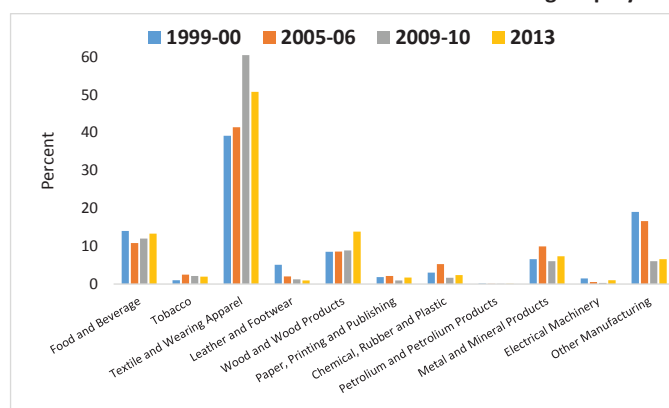
The sub-sectoral shares of employment are presented in Table 1.2. Among the manufacturing sub-sectors, all sectors, except leather and footwear and other manufacturing, experienced rise in their shares in total employment during 1999-00 and 2013. Among the services sub-sectors, except education and health sub-sectors, all sub-sectors experienced fall in their shares during the period under consideration.

Table 1.2: Sub-sectoral shares of employment (%)

Sub-sector	1999-00	2005-06	2009-10	2013
Agriculture, forestry and fishing	50.75	48.06	47.29	45.10
Mining and quarrying	0.45	0.11	0.20	0.40
Food and beverage	1.33	1.20	1.48	2.19
Tobacco	0.10	0.27	0.27	0.32
Textile and wearing apparel	3.73	4.57	7.46	8.35
Leather and footwear	0.49	0.22	0.16	0.16
Wood and wood products	0.81	0.95	1.09	2.27
Printing and publishing	0.17	0.24	0.12	0.28
Chemical, rubber and plastic	0.29	0.58	0.21	0.39
Petroleum and petroleum products	0.01	0.00	0.01	0.01
Metal and mineral products	0.63	1.10	0.75	1.20
Electrical machinery	0.14	0.06	0.04	0.17
Other manufacturing	1.81	1.84	0.74	1.08
Construction	2.82	3.22	4.81	3.69
Electricity, gas, water and waste management	0.38	0.19	0.23	0.34
Trade, hotel and restaurants	15.86	16.55	15.42	14.45
Transportation, storage and communication	6.34	8.39	7.42	6.45
Financial intermediation, real estate and other business activities	0.67	1.54	0.94	0.77
Public administration and defense	2.03	1.86	0.99	1.32
Education	2.67	2.76	2.37	3.23
Human health and social work activities	0.75	0.71	0.79	1.20
Other service activities	7.77	5.58	7.21	6.62
Total	100.00	100.00	100.00	100.00

Source: Author's calculation from the Labor Force Survey data

Figure 1.5: Shares of different sub-sectors in manufacturing employment (%)



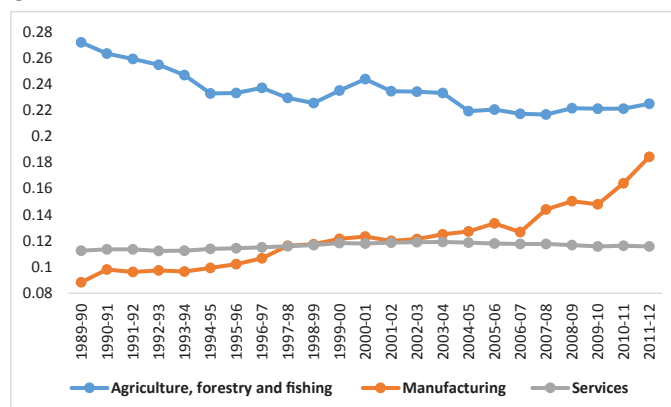
Source: Author's calculation from the Labor Force Survey data

Within the manufacturing sector, the shares of different sub-sectors in manufacturing employment are presented in Figure 1.5. There is no clear pattern and trend. Though the textile and wearing apparel is the major sub-sector of employment, as its share increased from 3.73 percent in 1999-00 to 8.35 percent in 2013, its share in total manufacturing employment declined to 50.8 percent in 2013. The sub-sector which experienced some significant rise in employment share during 2009-10 and 2013 is the wood and wood products, which had shares of around 8.5 to 8.9 percent during 1999-00 and 2009-10 but increased its share to 13.9 percent by 2013. Employment shares of other manufacturing sub-sectors fluctuated. However, there has been quite a remarkable drop in the share of other manufacturing, as its share declined from 19 percent in 1999-00 to 6.6 percent in 2013. The aforementioned analysis suggests that even with a decline in share in recent time, textile and wearing apparel is the major source of manufacturing employment in Bangladesh.

Despite some important structural transformation in the economy, the economic structure is still far from a well-diversified one. Figure 1.6 shows the trend in the calculated Herfindahl–Hirschman concentration index of value-added for three major sectors in the economy. It appears that in case of agriculture, forestry and fishing, though the concentration index declined in general during 1989-90 and 2011-12, since 2004-05, the concentration ratio didn't fall and in fact in recent years the concentration ratio increased. In case of manufacturing, there has

been a gradual rise in the concentration index and since 2006-07, the pace in such rise increased quite considerably. This suggests that the manufacturing sector in recent years has become less and less diversified. Interestingly, the services sector in Bangladesh has remained well diversified and the situation didn't change during 1989-90 and 2011-12.

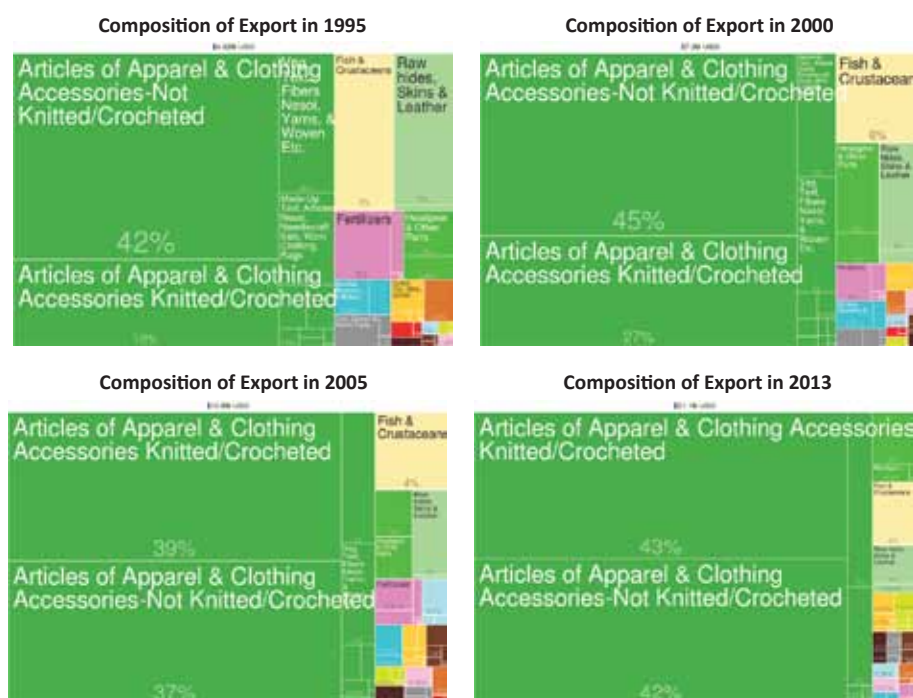
Figure 1.6: Herfindahl–Hirschman concentration index of value-added



Source: Author's calculation from the National Accounts data of BBS

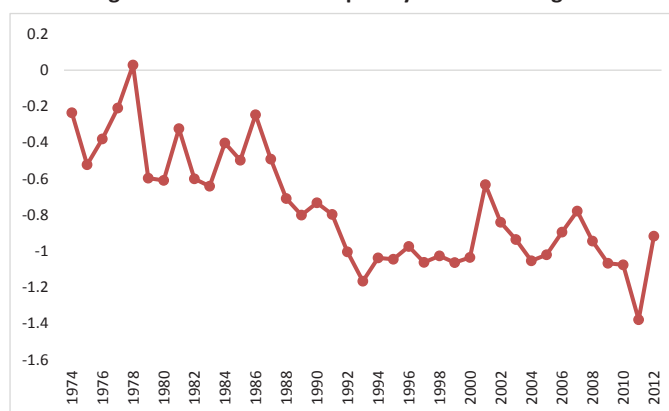
Such lack of diversification in the overall economy is also reflected in the export basket of Bangladesh. Figure 1.7 shows the movement of the composition of export in different time periods. It is clearly evident that with the remarkable growth in total exports during 1995 and 2013, the export basket became more and more concentrated around readymade garments (RMG). The growth of Bangladesh's RMG exports had largely been attributable to international trade regime in textiles and clothing, which, until 2004, was governed by the Multi Fibre Arrangement (MFA) quotas. The quota system restricted competition in the global market by providing reserved markets for a number of developing countries including Bangladesh, where textiles and clothing items have not been traditional exports. The Duty-free access for Bangladesh's RMG products in the EU has also greatly supported the growth of the sector.

Figure 1.7: Change in export composition



Source: <http://atlas.media.mit.edu/en/>

Figure 1.8: Economic complexity index for Bangladesh



Data Source: <http://atlas.media.mit.edu/en/>

One of the associated concepts of economic diversification is the economic complexity index. Hidalgo and Hausmann (2009) defined economic complexity index (ECI) as a measure of the production characteristics of large economic systems, usually whole countries. The goal of this index is to explain an economic system as a whole rather than the sum of its parts. The ECI looks to explain the knowledge accumulated in a country's population (the networks that people form) and that is expressed in the country's industrial composition. To achieve this goal, the ECI combines metrics of the diversity of countries and the ubiquity of products to create measures of the relative complexity of a country's exports. Figure 1.8 shows the trend in the ECI for Bangladesh during 1974 and 2012. It is observed that the ECI for Bangladesh has always been negative, except in 1978, suggesting very low level of economic complexity. The ECI had a fluctuating trend with improvements in some years. During 2000 and 2012, in general ECI declined with some year to year fluctuations.

Challenges for Economic Growth and Employment Creation in Bangladesh

Reform in the policies and institutions for economic diversification

Bangladesh's achievement in economic growth over the last one decade has been quite robust. The country has recently been upgraded from low income country (LIC) to lower-middle income country (LMIC) as per World Bank's classification. There is an aspiration of graduating from the LDC status to middle income country by 2021 as per UN classification. The 7th five year plan sets the target of 8 percent GDP growth rate by 2020. This requires a huge leap forward from the current level of 6 percent average growth rate. This also requires a considerable structural change in the economy leading to large scale economic diversification. Economic diversification is commonly viewed as a necessary condition for a sustained and long-term growth of the economy and job creation. Diversification is argued to be playing an important role in structural transformation of the economy from producing low value-added products to high value-added products. Promotion of labor-intensive and high-productivity sectors, both in the farm and nonfarm sectors, is therefore fundamental. This should be coupled with interventions to enhance productivity, jobs and incomes in traditional and informal activities where there are large pools of surplus labor.

However, it is important to note that strategies specified in the different policies in Bangladesh for economic and export diversification lack clear guidelines as regards to implementation, and therefore, result in ineffective strategies. In the case of export diversification, it has been a matter of serious concern that though there are significant incentives provided to the export sector in Bangladesh, there is formidable difficulty in actually accessing such incentives and they helped little in diversifying the export basket. Furthermore, though the latest industrial policy identifies a number of high priority and priority sectors for economic diversification, there are several policy-induced and supply-side constraints that have constricted the development of these sectors. Unless and until these policy-induced and supply-side constraints are addressed, the agenda for further productive economic diversification will remain unfulfilled.

One strong view related to the policy for diversification of exports is its heavy emphasis on extensive tariff liberalization with the aim of reduction in anti-export bias. The policy conclusion that emerges from this stance is for low and uniform tariffs and a seamless export-import regime that facilitates least-cost transactions at the border. Tariff liberalization, under this view, is seen as a kind of ‘auto’ driver of export expansion and diversification of the export basket. While the importance of tariff liberalization for export promotion and diversification can’t be undermined, and in Bangladesh there is a need for further tariff rationalization and liberalization, tariff liberalization alone can’t by itself be sufficient to trigger ‘auto’ large supply responses in terms of expanding export volumes and diversifying the export basket. A number of supply-side constraints can prevent local producers from expanding exports, and the lack of an enabling environment can strangle entrepreneurship and innovation. Studies have indicated that Bangladesh faces several supply-side constraints. High lead-time is an important challenge. Inefficiencies at ports and related internal road transportation further aggravate the problem. Amongst others, lack of investment fund and working capital, high interest rate, poor physical infrastructure, shortage of skilled workers, technological bottlenecks, lack of entrepreneurship and management skills, poor law and order situation, lack of information, invisible costs of doing business, etc. are major impediments to export prospects and export diversification. Therefore, the policy options and support measures for exports are much more difficult and involved than mere reduction of tariffs.

It is important to note that in the discourse of policy reforms for economic diversification the political economy perspective is generally ignored and reform of institutions is largely overlooked. A favorable overall incentive structure through the management and distribution of ‘rent’ is important for diversification. Experiences from many developing countries show that the dominant sector becomes the main beneficiary of different incentives (both formal and informal) while for other sectors, such schemes appear to be less effective primarily due to various structural bottlenecks as mentioned before. In this process, the dominant sector grabs the lion’s share of the ‘rent’ being generated through such incentives.

This situation also raises a critical question as to whether ‘rents’ are needed for the promotion of other sectors. Experiences from successful countries highlight the importance of providing effective incentives to other sectors and removing structural bottlenecks in order to generate some ‘rents’ in those sectors. However, it should be kept in mind that while generating such ‘rent’, there is a need for a well-designed and effective industrial policy wherein monetary (interest rate subsidies) and fiscal incentives (reduced taxes or tax holidays) for the emerging dynamic export sectors should be transparent and time-bound. In addition, industrial policy needs to address issues of education and skill development for facilitating higher capabilities for economic diversification, attracting FDI and integrating with the global value chain.

Experiences from different countries also suggest that institutional reforms should be considered as a key to overall policy reforms. Improving the bureaucracy quality, ensuring property rights, managing corruption, ensuring contract viability through reduction of the risk of contract modification or cancellation are examples of such institutional reforms. Furthermore, reducing political uncertainties or establishing political stability and generating political capital for economic diversification are critically important.

Transition from ‘good-enough’ job to ‘decent’ job

Though there are many views on ‘inclusive growth’, the key consensus is that ‘inclusive growth’ is a growth process which reduces poverty and inequality, promotes ‘decent’ jobs, reduces social exclusion and promotes economic and social cohesion. One of the major pillars of inclusive growth is ‘decent’ job, where ‘decent’ job is referred to a productive job for women and men in conditions of freedom, equality, security and human dignity. It also involves opportunities for work that deliver a fair income; provides security in the workplace and social protection for workers and their families (ILO, 2011).

Bangladesh economy had been growing at a rate over 5 percent over the last two decades. There are arguments that such growth in Bangladesh has been largely ‘inclusive’ in nature and Bangladesh has been successful in generating ‘good’ jobs by improving farm-nonfarm, rural-urban inter-industry inter-sectoral labor mobility at a relatively low skill level that had poverty reducing and social cohesion enhancing effects (Hossain, et al. 2012).

Such claims demand careful examination as it is not clear how ‘good’ job is defined in the context of Bangladesh economy. It is equally important to understand what needs to be done in the transition towards a regime of ‘decent’ jobs, a critical factor for the promotion of ‘inclusive growth’ in the country.

‘Decent’ job should be regarded as a dynamic and progressive phenomenon. There could be three stages for moving towards ‘decent’ job. The first stage is the ‘good-enough’ job which shows the transition from no job to job or from unpaid family job to paid-job. The second stage is the ‘good’ job which shows the transition from ‘good-enough’ job to job with better return, formal job security and enhanced workers’ rights. The third stage is the ‘decent’ job, which is the transition from ‘good’ job to a state of productive employment in compliance with agreed international standards of working environment and workers’ rights.

The economic growth process in Bangladesh, over the past two decades, has been in a position to generate employment in agriculture, rural non-farm sector, urban informal sector, and the urban formal sector, mostly in RMG. Apart from RMG, employment in all other sectors has largely been for males, mostly informal in type. The nature of these jobs has been largely ‘good-enough’. Rise in employment in agriculture, both in the crop and non-crop sectors, has been associated with agricultural growth and rise in agricultural real wage, with virtually no progress towards ‘good’ job. Rises in employment in the rural non-farm and urban informal sectors have also happened without much progress towards the creation of ‘good’ jobs in these sectors. For males, such expansion has helped moving out from unemployment or unpaid family labor to ‘good-enough’ jobs. For females, employment in the RMG sector, in most cases, is a manifestation of the transition from no labor force participation or unpaid family jobs to paid-jobs. Such paid-jobs in most of the RMG factories are largely ‘good-enough’ in nature. Thus, the RMG sector has been able to generate very large ‘good enough’ jobs, which however has also contributed to the reduction in poverty and generating growth in Bangladesh.

It should also be kept in mind that though the economic growth process over the past two decades has been able to increase the rate of female labor force participation in Bangladesh, the rate is still very low. Evidence suggests that female labor force participation reduces the likelihood of household poverty; and resources in females’ hands have a range of positive outcomes for human capital and capabilities within the household. Thus there is a strong rationale for ensuring females’ participation in the economy’s growth process. Education, skill development, public and private sector initiatives in investment in the care economy as well as different social protection programs can be very useful in increasing female labor force participation.

While discussing ‘inclusive growth’, it is equally important to understand the quality of structural transformation that has happened in the process of economic growth in Bangladesh. Though the share of industrial sector in GDP has increased from around 20 percent in the early 1990s to around 30 percent by late 2000s, with a simultaneous reduction in the share of agricultural sector, there is still a long way to go for the creation of large scale ‘good’ jobs in the urban sectors. This will require both quantitative and qualitative changes in the current pattern of structural transformation of the economy. The economy is yet to have a strong and diversified manufacturing base, which requires supporting macroeconomic, trade and industrial policies and removal of policy-induced and supply-side constraints.

In the near future, for the promotion of inclusive growth, the challenge of the Bangladesh economy, as far as the quality of employment is concerned, is how to make a transition from the current state of ‘good-enough’ jobs to large scale ‘good’ jobs. In the medium to long term, the prospect of inclusive growth in Bangladesh would depend on how the growth momentum would be able to generate successful transition towards a state of ‘decent’ job.

The future of the RMG industry in Bangladesh

Manufacturing is now an overwhelmingly salient component of the Bangladesh’s export composition, thanks largely to the rapid expansion of the RMG industry. From a small base of only around US\$ 32 million in 1984, garment exports have grown to around US\$ 25 billion by 2014, accounting for more than three-quarters of export earnings. RMG has been an important contributor to growth and employment generation in Bangladesh. Female participation in the formal labor market underwent a major shift with the rise of the RMG industry in Bangladesh.

It provides direct employment to over 4 million people, 70 per cent of whom are female. More than 50 per cent of the manufacturing labor force is now employed in this sector, and the sector accounts for 30 per cent of the investment in manufacturing. Therefore, the story of the growth of the manufacturing sector in Bangladesh over the past two decades has been the story of the success of the RMG sector.

There is no denying the fact that the success story of the RMG industry in Bangladesh lies in its comparative advantage generating from the country's large pool of unskilled labor. Considering the fact that Bangladesh's Asian neighbors and competitors such as India, Pakistan, Sri Lanka and China also have large pool of unskilled labor, it is certainly astounding how Bangladesh has been able to retain its comparative advantage till date and has enjoyed continued export growth. While cheap labor has been the single most important advantage of Bangladesh, the local industry has flourished in spite of numerous challenges, e.g., high cost of doing business, weak infrastructure, weak governance, and labor unrests.

There have been concerns with regard to the compliance issues and the work place safety in the RMG industry in Bangladesh, and in the last couple of years these issues have become very critical for the future of this industry. There is strong international pressure, in the form of the threat of cancelling large preferences in the markets of Western countries, if labor conditions are not improved. Quality competitiveness is getting increased priorities over price competitiveness, and of course, quality of a product embodies the standard of living of labor being used in the production process. These concerns should be addressed in a positive way as an opportunity to build industry's reputation in the global market. This calls for, among many other things, to deal with labor issues in the garment industry carefully. In this context, issues like wage, workplace security, fringe benefits, workplace environment etc. need to be resolved on a priority basis. Current labor practices prevalent in the garment industry need to be improved in order to make the sector sustainable. Improvement of the labor condition is closely linked to the enhancement of the productivity of labor. There is equally a need to invest in training workers to move up to the higher value added garment products. The BGMEA and the government should collaborate with each other, with help from relevant international agencies, to be able to work effectively in this area.

The RMG industry of Bangladesh is now at a crossroad. It is now time to focus on how Bangladesh can retain its comparative advantage and continue its success story. Reliance on only the mass pool of unskilled labor doing things in the old way is not sufficient. Careful examination of Bangladesh's comparative advantage in the RMG industry reveals the fact that the nature of this advantage is primarily static in nature. This suggests, retaining the static comparative advantage will be highly challenging in the future given the increased competition from other countries, growing stringent compliance issues, and the fact that to what extent the country will be able to enhance its competitiveness in doing business. Therefore, the sector should aim for generating dynamic comparative advantage which would ensure sustainability of this sector in the future. There is a critical need for enhancing labor productivity, moving up to the higher value-added products through introducing new technology along the production line spurring innovation, and enhancing Bangladesh's competitiveness by reducing the cost of doing business.

It is also essential to keep in mind that comparative advantage doesn't necessarily translate into competitive advantage. Given an environment of high cost of doing business, in order to maintain the competitive advantage, there is a tendency of putting downward pressure on workers' wages and benefits. In this context, for the workers' welfare, there is a critical need for reducing the cost of doing business in Bangladesh. Otherwise, this will eventually determine the competitive advantage of Bangladesh's garment industry and exports. Addressing these issues require strategic planning and its adroit implementation.

The future of the RMG industry will be critical for Bangladesh's socio-economic development. Although the evidence on trade-growth and trade-poverty relationships as found in academic studies is still far from being conclusive, the growth of RMG exports has been associated with the overall economic growth of the country accompanied by a remarkable progress on poverty alleviation. Even without going deep into such hotly debated subjects as whether the export sector has been the 'engine' of growth and to what extent the growth has been equitable to reach the poorest groups, it can be said that the RMG-led export growth process has established a direct link between trade and poverty in Bangladesh by creating massive employment opportunities. And the

sustainability of this industry also depends on how carefully and properly the issues related to the welfare of the workers are addressed.

Tackling ‘entitlement failure’ in infrastructure

In the discourse on infrastructure and economic growth the dominant area of discussion is on the quantity and quality of infrastructure and how countries differ in these respects. While most of the countries emphasize a lot on investing in raising the quantity (and quality) of infrastructure, there is a fundamental concern whether rising supply of infrastructure ensures the access to infrastructure. This problem is manifested through the fact that due to a variety of reasons enhanced supply of infrastructure may not solve the problem of ‘entitlement failure’ in terms of effective access to infrastructure, as the people/sectors in dire need of improved infrastructure may not have the access even with an increased supply.

There appears to be a consensus among researchers and policy makers that infrastructure is a key contributing factor to economic growth. The importance of infrastructure for economic development originates from the fact that it provides both final consumption services to households and key intermediate consumption items in the production process. The deficiency of some of the most basic infrastructure services is an important dimension of poverty; and therefore, increasing level of infrastructure stock has a direct bearing on poverty reduction. Furthermore, while it is generally accepted that economic diversification is a necessary condition for a sustained and long term growth of the economy and job creation, infrastructure development is a prerequisite for economic diversification.

What is the significance of economic diversification as far as ‘inclusive growth’ is concerned? If inclusive growth is defined as the inclusiveness in economic opportunities, economic diversification can help attain inclusive growth. However, several supply-side constraints related to weak infrastructure can restrict economic diversification. Some of these constraints are broadly ‘general’ in nature and some are critically ‘sector-specific’. Interconnection and complementarities between general and sector-specific infrastructures are key elements for increasing service efficiency, supporting the adoption of innovative technologies, promotion of economic diversification and supporting inclusive growth.

Yet, policymakers in the developing countries are so inclined towards improvements in the broad general infrastructure, i.e., enhanced supply of electricity, improvement in roads, improvement in port facilities, etc. that the developments of critical sector-specific infrastructure are largely overlooked. Embarking on developing broad general infrastructure are relatively easy, whereas solving sector-specific infrastructure problems involves identifying priorities in the policy making process and addressing a number of political economic issues. Failure to deal with sector-specific infrastructure problems leads to a scenario where a large number of potential inclusive-growth enhancing sectors fail to enjoy the benefit from the improvement in broad general infrastructure, and thus end up with ‘entitlement failure’.

One such example is the leather industry in Bangladesh which accounts for around one billion US\$ in exports and which has huge potentials in generating employment and growth by increasing export of higher value added products. However, this sector has not yet reached its full potential primarily due to operating constraints stemming from its production base in Hazaribagh of Dhaka city where there are minimal waste management systems and inadequate industrial layout planning. The Hazaribagh-centric tannery industry is now legally bound to relocate all the factories to a new environmentally compliant tannery estate (under construction) on the outskirts of Dhaka city. However, such relocation has been stuck for many years with unresolved decisions on cost sharing of various components of the new industrial estate. Yet, there is no denying the fact that unless this relocation is effectively done, the leather sector will continue to suffer from ‘entitlement failure’ despite significant improvements in broad general infrastructure.

Factors responsible for such entitlement failure include the lack of resources to undertake sector-specific infrastructure development, lack of reliable data to determine finance and manpower requirements of projects, lack of infrastructure development framework that adequately delineate links between general and sector

specific infrastructure requirements, inadequate planning, inadequate supporting institutions, and unstable political environments. However, on top of all these, the major critical factor behind the failure to address sector-specific infrastructure problems is the inability of the political system to deliver a political consensus around strategic plans for such sector-specific infrastructure and stable policy frameworks to support their implementation.

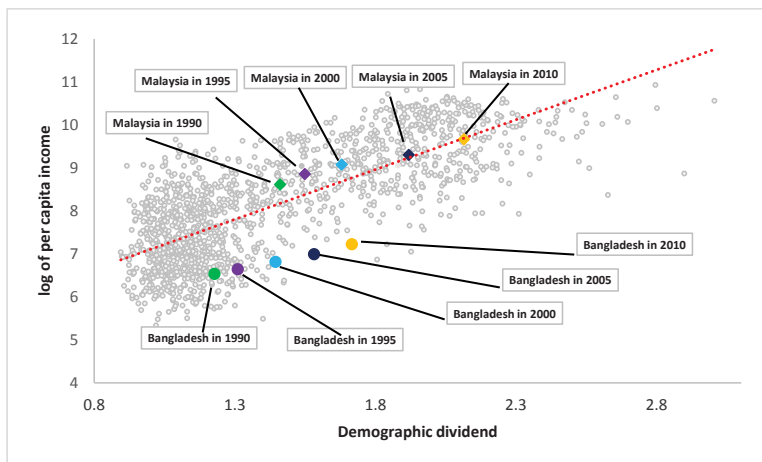
How to deal with this entitlement failure? A major part of the sector-specific infrastructure problems needs to be solved through public investment. The priorities in the industrial and related policies need to be realigned to the country's long term economic growth strategy in the changing world economy. There is a need for generating political capital for such realignment. However, the task of developing such infrastructure facilities cannot be left to the government alone. It is binding on policy makers to come forward with strategies and mechanisms to encourage private sector participation in such sector-specific infrastructure developments. Such mechanisms should not only provide paper strategies, but also practical ways of turning into tangible projects through the provision of adequate finance.

Making most of the demographic dividend

For long, debates among economists and social scientists on the impact of population change on economic development centered on positions that population growth either restricts, promotes, or is independent of economic development. Despite the merits of these views, a critical issue is largely ignored which is the age structure of the population that can change dramatically as the population grows. As people's economic behavior varies at different stages of life, changes in a country's age structure can have substantial effects on its economic performance. This latter view relates to a 'demographic dividend' which can exert a large positive effect on the economy stemming from a favorable age structure of the country.

The demographic dividend is not, however, automatic. With the right kind of policy environment, this demographic dividend can attain the targeted objectives. This brings to the fundamental question: how to make the most of the demographic dividend?

Figure 1.9: Demographic dividend and economic growth



Note: The scatter-plot is generated with the data of 124 countries for the period between 1950 and 2010 with five-year intervals. Data source: United Nations Department of Economic and Social Affairs-Population Division and World Bank, WDI

A simple association between the demographic dividend and per capita income, as is shown in the scatter-plot in Figure 1.9, can shed some light on this issue. The scatter-plot is generated with the data of 124 countries for the period between 1950 and 2010 with five-year intervals. The demographic dividend is calculated from the data of the United Nations (Department of Economic and Social Affairs-Population Division), and is defined as the ratio of working age population to the dependent population. The per capita income data are from the World Bank WDI. Since demographic dividend might have a lag effect on per capita income change, we assume that the data of demographic dividend for any particular year corresponds to the average per capita income data for the

subsequent five years. For example, demographic dividend data for 1950 corresponds to the average of per capita income data for 1951-1955. The trend line (red-dotted) shows a very strong positive association between the demographic dividend and per capita income. Though simple, but even this scatter-plot tells us a very interesting story. If we compare Malaysia with Bangladesh we find that both Malaysia and Bangladesh, during 1990 and 2010, were experiencing rising demographic dividends which contributed to the rise in their per capita incomes. However, Bangladesh has always been much below the trend line; whereas Malaysia was always on or above the trend line. This suggests that compared to Bangladesh, Malaysia was much better able to utilize its demographic dividend to raise its per capita income during the period under consideration. For Bangladesh, the concern is that the country is yet to exploit the demographic dividend it has, and over time, the distance from the trend line has enlarged. Interestingly, in 2010, Bangladesh had the demographic dividend similar to the one Malaysia had in 2000, but Bangladesh in 2010 had one-seventh of the per capita income of what Malaysia had in 2000.

The lesson for Bangladesh is that for making the best use of the demographic dividend to successfully capitalize on shifts in country's age structures to gain a boost in economic productivity, the critical policy areas should include investment in youth development, expanding access to family planning, investment in infrastructure, public health, education, especially female education and skill development. Also, decisive policy emphasis should be on promoting both labor-intensive and skill intensive jobs, savings and openness to trade and foreign investment.

Conclusion

The analysis in this paper suggests that, for further economic growth acceleration and employment generation in Bangladesh, there is a need for reforms in the policies and institutions, promoting the transition from 'good-enough' job to 'decent' job, investment in infrastructure and tackling 'entitlement failure' in infrastructure, and making most of the demographic dividend through investment in youth development, public health, education, and skill development.

All these will require increased domestic private investment and FDI targeting broader economic and export diversification. Emphasis should be not only on raising the level of investment but also on the efficiency of investment through removal of a number of supply side bottlenecks in the economy. There is a need for a new paradigm of macro, trade and investment policies with effective and time-bound support to emerging dynamic sectors.

Reform of economic and political institutions for efficiency gains is critically important. Improving the bureaucracy quality, managing corruption, reducing political uncertainties and establishing political stability, generating political capital for larger private sector investment and accelerated economic growth, are all part of the institutional reform.

What determines the Choice between Farm and Nonfarm Employments in Rural Bangladesh?

Selim Raihan and Syer Tazim Haque

Introduction

With a small geographic size and huge population, employment generation for all economically active population is a major challenge in Bangladesh. Though agriculture has been the major employment generating sector, the rural economy in Bangladesh has been experiencing a transition over the past two decades. While unpaid family work in the rural areas is still highly farm-based, paid employment is mainly experiencing the transition, shifting more towards nonfarm activities. World Bank (2004) reported that the rural nonfarm sector in Bangladesh accounted for about 40 percent of rural employment during early 2000s. Recent labor force surveys reveal some strong evidence of growth in the rural nonfarm economy. The growth of the rural nonfarm sector is very evident, because, with the limited arable land and intensification of the ones that are available reaching its peak, agricultural sector is least likely to absorb the growing rural labor force. With these contexts in frame, the current paper provides an overview of the potential determinants of the nonfarm participation in rural Bangladesh, and makes a systematic analysis of the determinants of employment-switch between farm and nonfarm sectors in rural Bangladesh. In this paper we use data from the Household Income and Expenditure Surveys (HIES) of Bangladesh Bureau of Statistics (BBS) as the HIES data provides detailed household level socio-economic information, which is helpful for such analysis.

Literature Review

Studies conducted in the contexts of many developing countries found evidence of rural nonfarm sector contributing to the growth of rural economy and reducing poverty (Hymer and Resnic, 1969; Binswanger, 1983; Islam, 1984; Saith, 1992; Ranis and Stewart, 1993; Hayami and Kikuchi, 2000; Berdegue and Escobar, 2002). In general, these studies found that rural nonfarm sector, through employment generation, helped in diversifying the earning source of the rural households. Not only did many households find their employment in the vibrant rural nonfarm sectors, but also many households undertook the nonfarm activities as secondary jobs for smoothing consumption in the lean agricultural seasons. Indeed, smoothing consumption is found to be a major problem in many agrarian societies and there is a large body of literature to support this claim (Khandker, 2009).

There are some debates on the definition of rural nonfarm sector. Hossain (2004) considered a narrow definition of the rural nonfarm activities which included only non-agricultural activities and excluded non-crop farming activities such as livestock, fisheries and forestry. Davis and Bezemer (2003) however emphasized that the definition of rural nonfarm sector depends on what definition of agriculture is being used. Agriculture may include crop production and non-crop activities such as forestry, fisheries, livestock rearing, horticulture (flowers and vegetables) or it may include crop activities only and exclude the non-crop part. Lanjouw and Lanjouw (1997) defined rural nonfarm economy as being all those income generating activities (including income in kind) that are not agricultural but located in rural areas. Keeping in mind the aforementioned debate, in this paper, we have defined rural nonfarm economy comprising all those non-agricultural activities which generate income to rural households, either through wage-employment or self-employment.

Pattern and Trend of the Nonfarm Employments in Rural Bangladesh

The transition from farm to nonfarm occupation started taking place in the early 1980s. But, during the 1990's nonfarm sector became more prominent and started contributing more to income generation. By the year 2000 about 40 percent of the income for the rural households was derived from nonfarm sources (HIES 2000). Along with the household level contribution nonfarm sector contributed substantially to GDP as well accounting for about one third of it where the agricultural sector contributed to about a quarter (World Bank 2004).

The diversification of employment over time took place in two major ways. There had been a structural change in the agricultural employment during this period and the other change was brought upon by shifting out of labor from the agricultural sector. It appears from Table 2.1 that in rural Bangladesh there has been a decline in the share of farm employment from 60.36 percent in 1995 to 55.16 percent in 2010 and simultaneous rise in the nonfarm employment from 39.64 percent to 44.84 percent during the same period. Even with the farm employment, there has been a shift from crop agriculture to non-crop agriculture as the share of crop agriculture declined from 54.63 percent to 49.24 percent and that of non-crop agriculture (with some fluctuations) increased from 5.73 percent to 5.92 percent during the period under consideration.

Table 2.1: Share of farm and nonfarm employments in total rural employment (%)

Sectors	1995	2000	2005	2010
Farm employment	60.36	63.12	56.76	55.16
<i>of which</i>				
<i>Crop agriculture</i>	54.63	55.19	52.9	49.24
<i>Non-crop agriculture</i>	5.73	7.93	3.86	5.92
Nonfarm employment	39.64	36.88	43.24	44.84
Total	100.00	100.00	100.00	100.00

Source: HIES data different years

A further disaggregation can be done to analyze the occupational structure in the nonfarm activities. Table 2.2 shows the participation of head of the households (who were in occupation) in various activities. The share of 'agricultural, animal husbandry, forestry and fisheries' declined from 64.04 percent in 1995 to 56.52 percent in 2010. Among nonfarm activities, there have been notable rises in the shares of 'production & related workers and transport workers' and 'service workers' during that period. While the shares of 'professional, technical & related workers', and 'sales workers' remained more or less stable, the share of 'clerical and related workers and govt. executive' declined drastically during 2005 and 2010.

Table 2.2: Household head's major occupation in the rural area (% of total)

	1995	2000	2005	2010
Professional, technical & related workers	4.49	5.50	7.19	5.85
Administrative & managerial works	0.11	0.21	0.10	2.31
Clerical and related workers and govt. executive	2.14	8.09	8.86	1.58
Sales workers	13.00	10.68	12.30	10.84
Service workers	3.94	5.08	7.09	6.58
Production & related workers and transport workers	11.37	9.13	7.78	16.32
Agricultural, animal husbandry, forestry & fisheries	64.94	61.31	56.69	56.52
Total	100.00	100.00	100.00	100.00

Source: HIES data different years

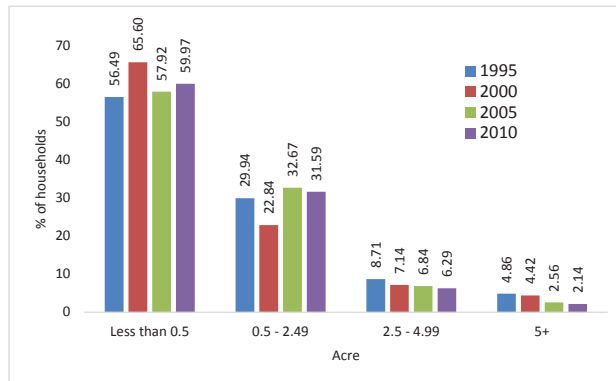
Overview of the Potential Drivers of Employment Switch in Rural Bangladesh

Available literature suggests that there could be a number of push and pull factors which can determine the employment switch between farm and nonfarm activities in rural Bangladesh. These are land ownership, age, education, relative wages, and rural infrastructure. Before, going into any systematic analysis with regard to the impact of these factors on the choice of employment, this section provides an overview of these potential drivers of employment switch.

Land ownership

Figure 2.1 shows a rise in the share of households with less than 0.5 acres of land during 1995 and 2010 from 56.49 percent to 59.97 percent (though the share rose quite dramatically to 65.6 percent in 2000). It also appears that the share of households with higher average land size had been declining. This clearly indicates the growing trend of landlessness in rural Bangladesh and concentration of land in the hands of fewer households over time.

Figure 2.1: Distribution of rural households by size of owned land



Source: HIES data different years

Age distribution

Hossain (2004) found that the nonfarm participation was higher among younger households. Rahman (2013) also found that younger generation had a preference to participate in nonfarm activities in the rural areas. It is also evident from Table 2.3 that during 1995 and 2010, in general, though the participation in nonfarm activities increased among all age groups, such rise had been much higher for the younger age groups compared to the older age groups.

Table 2.3: Farm and nonfarm participation by age distribution

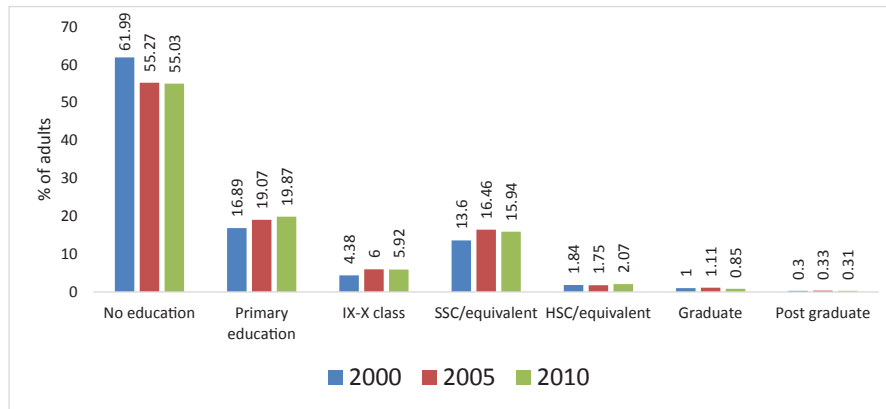
Age group	1995			2000			2005			2010		
	Farm	Non-farm	Total	Farm	Non-farm	Total	Farm	Non-farm	Total	Farm	Non-farm	Total
15-24	61.56	38.44	100	60.48	39.52	100	50.32	49.68	100	48.34	51.66	100
25-34	55.07	44.93	100	58.85	41.15	100	50.28	49.72	100	48.51	51.49	100
35-44	55.32	44.68	100	60.15	39.85	100	56.05	43.95	100	53.65	46.35	100
45-54	61.74	38.26	100	65.89	34.11	100	60.78	39.22	100	60.63	39.37	100
55-64	71.77	28.23	100	74.83	25.17	100	70.31	29.69	100	68.99	31.01	100
65+	75.47	24.53	100	78.64	21.36	100	73.78	26.22	100	71.69	28.31	100

Source: HIES data different years

Education

Higher level of educational attainment can stimulate the choice in favor of nonfarm employment (Islam, 1997; Hossain, 2004). Figure 2.2 shows that during 2000 and 2010, 'no education' among rural adults declined from around 62 percent to 55 percent, while the share of adults with education above the primary level increased over time. This suggests that though majority of the rural adults are yet deprived of education, the scenario is gradually changing.

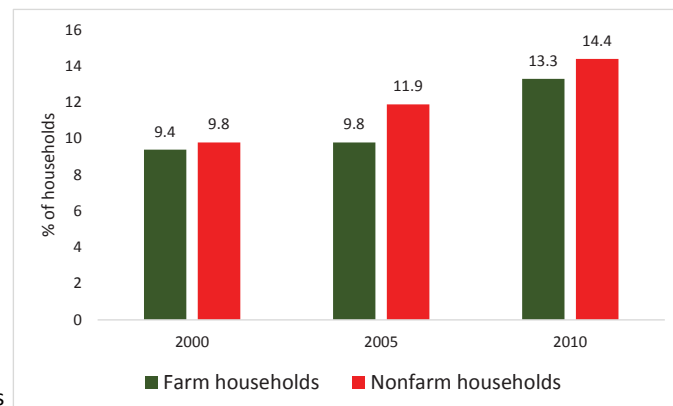
Figure 2.2: Progress in the educational attainment in rural areas during 2000 and 2010



Source: HIES data different years

It is also observed that there are differences in education attainment between farm and nonfarm households (as classified by the occupation of the household head). Figure 2.3 shows the differences in mean years of schooling of adults between farm and nonfarm households. Mean years of schooling is found to be higher for the nonfarm households for all three years compared to farm households. Also, the rise in mean years of schooling during 2000 and 2010 had been higher for nonfarm households (47 percent) compared to the farm households (41 percent).

Figure 2.3: Difference in mean years of schooling of adults

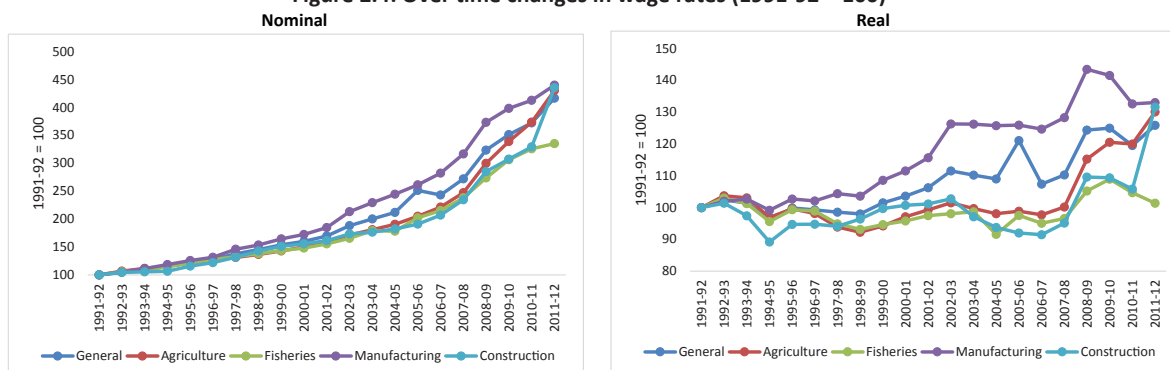


Source: HIES data different years

Real and relative wages

One important finding of Hossain (2004) was that, nonfarm activities are more productive in nature and provides a higher return. Hence that mobility across sectors can be interpreted as is fueled from a pull factor. Figure 2.4 highlights the differences in nominal and real wage across broad sectors during 1991-92 and 2011-12. Though all broad sectors observed increase in nominal wages, fisheries sector is found to be at the bottom. Manufacturing and construction had been on top in all those years. The gap between manufacturing and agriculture widened during the mid-2000s; however, such gap got reduced in recent years. Similar pattern emerges in case of real wages as well.

Figure 2.4: Over time changes in wage rates (1991-92 = 100)



Source: BBS. The original data has 1969-70 as the base. We have adjusted it for 1991-92 as the base. The real wage rates have been calculated by dividing the nominal wage with national CPI.

Table 2.4 provides disaggregated sectoral level relative wages with respect to the daily wage in crop cultivation. It is clear that between 2000 and 2005, the gaps between the wage of crop cultivation and wages of most of the nonfarm activities widened; though between 2005 and 2010, such gaps were reduced. However, in 2010, wages in all nonfarm activities were considerably higher than that of the crop cultivation.

Table 2.4: Daily relative sectoral wages in rural areas with respect to wage in the crop cultivation

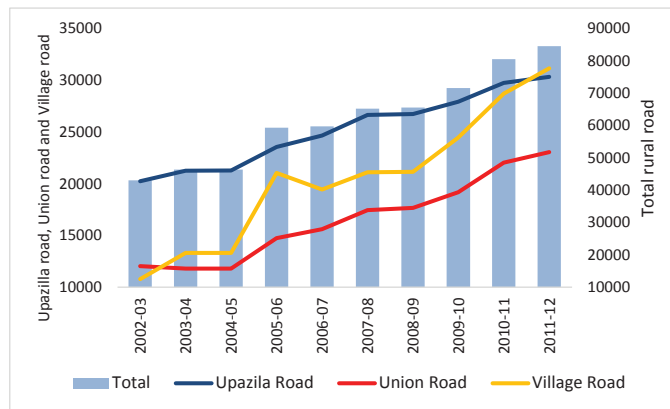
Sector	2000	2005	2010
Crop cultivation	1.0	1.0	1.0
Livestock rearing	0.4	2.2	0.9
Poultry rearing	1.1	3.1	1.2
Fisheries	1.2	1.8	1.2
Forestry	1.4	1.5	0.8
Mining and quarrying	1.1	1.6	1.0
Food processing	0.8	1.9	1.3
Textile	1.2	2.6	1.0
Wearing apparel	0.6	5.1	1.4
Leather	1.0	4.4	1.5
Wood and furniture	1.5	1.8	1.1
Paper, printing and publishing	1.1	6.6	1.8
Chemical, rubber and plastic	1.7	7.3	1.4
Transport equipment	0.8	2.5	1.0
Electricity gas and water	2.4	10.0	1.5
Construction of building	1.8	1.5	1.1
Electrical installation (under specialized construction)	1.6	2.6	1.8
Repairing of vehicles	0.7	2.6	1.1
Wholesale and retail and other trade	1.0	3.0	1.3
Land transport	1.6	2.8	1.1
Water transport	1.1	3.9	1.2
Postal courier	0.6	6.2	1.9
Hotel and restaurants	0.9	2.5	1.3
Administrative and support activities	0.8	9.5	1.8
Education	2.1	7.4	1.8
Health	2.8	7.4	1.8
Other service	1.0	2.9	1.2
Activities of household as employers	0.6	1.8	1.5

Source: Authors' calculation from LFS data

Infrastructure

Infrastructure can be an important catalyst in generating nonfarm employment (Islam, 1997; Hossain, 2004; Deichmann et. al 2008). Figure 2.5 shows that there has been a significant improvement in rural paved roads during 2002-03 and 2011-12. Though all three categories of rural roads, namely Upazilla road, Union road and Village road experienced positive growth, the expansion of the Village road in recent years has been quite remarkable.

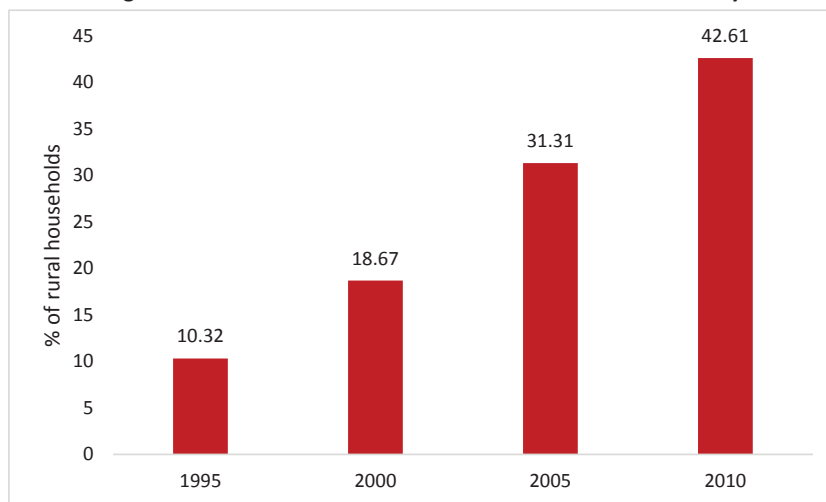
Figure 2.5: Growth in rural paved roads (in kilometers)



Source: Statistical Pocketbook of BBS, various years

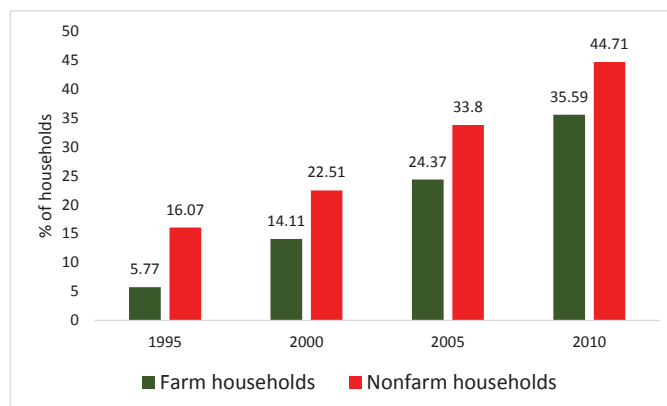
Figure 2.6 clearly shows that there has been a remarkable rise in the share of rural households with access to electricity. In 1995, only 10.32 percent rural households had access to electricity, and by 2010, the share increased to 42.61 percent. Figure 2.7 indicates that the nonfarm households had much greater access to electricity than the farm households during the period under consideration.

Figure 2.6: Percent of rural households with access to electricity



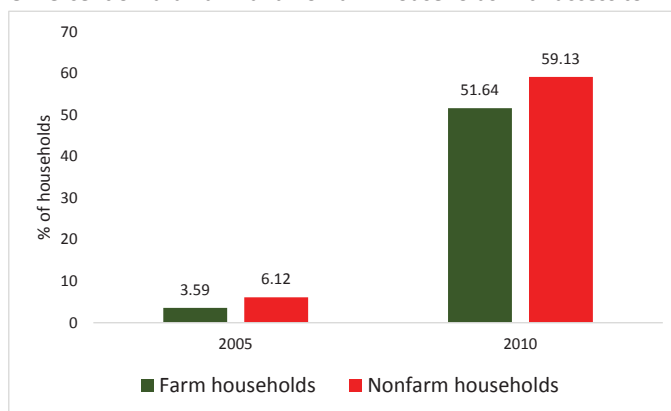
Source: HIES data different years

Figure 2.7: Percent of rural farm and nonfarm households with access to electricity



Source: HIES data different years

Figure 2.8: Percent of rural farm and nonfarm households with access to mobile phone



Source: HIES data different years

The development of rural infrastructure in recent years is also manifested by the remarkable rise in the mobile phone subscribers in the rural areas. Figure 2.8 shows that between 2005 and 2010, both for farm and nonfarm households the access to mobile phone increased quite dramatically. The nonfarm households seem to have larger access to mobile phone than their counterparts.

Determinants of Employment Switch in the Rural Bangladesh: A Pseudo Panel Econometric Analysis

One of the major limitations of most of the empirical studies on the rural nonfarm sector employment in Bangladesh is that they used cross-section data and could not take into account a longer time horizon, and control for endogeneity and heterogeneity bias. This is where the current study differs from others as the study develops a pseudo panel database considering four rounds of HIES data over a time span of 15 years, and this allows to control for the aforementioned biases.

Since the HIES does not survey the same households in different years, constructing a normal panel is not possible. However, to capture the dynamics of employment-switch over time, the necessity of panel data cannot be stressed any further. Therefore, this study constructs a pseudo panel data set using four rounds of the HIES from 1995 to 2010. Since this paper only focuses on the rural households, a pseudo panel data for the rural households is constructed separately. Data of rural households for each survey year is divided into 100 cohorts where the cohorts are defined based on percentile ranking of monthly consumption expenditure of households. As there are 100 cohorts in each survey year, four rounds of data generate 400 observations in total.

In the panel regression, the dependent variable is the relative nonfarm participation (the ratio of the number of adults participating in the rural nonfarm activities to the number of adults participating in the rural farm activities within any percentile cohort). This variable shows the switch between rural nonfarm and farm employments. The explanatory variables are relative nonfarm income, average age of adults within any percentile cohort, average years of schooling of adults within any percentile cohort, the labor force participation (LFP) rate of adults within any percentile cohort, rural infrastructure, as represented by the share of households with access to electricity in total households within any percentile cohort, and the size of land holding within any percentile cohort. All variables are expressed in natural logarithms.

This study uses a two-stage instrumental variable regression method to tackle the endogeneity problem arising from the variable relative nonfarm income (ratio of nonfarm to farm income). At the first stage, a regression is run considering the factors affecting the relative nonfarm income to get the endogeneity corrected predicted values of relative nonfarm income. The results of the first stage regression are presented in Table 2.5. Selection of appropriate instrumental variable (IV) for this model is complicated because any variable that affects the farm-nonfarm participation is likely to affect relative nonfarm income. However, the relative nonfarm income comprises of both nonfarm income and capital or asset income. This, in particular, is the key to IV selection. From

empirical testing it is found that household head's education did not have any statistically significant impact on farm-nonfarm employment switch but household head's education showed a positive correlation with nonfarm income. Therefore, household head's education has been used as the IV in the two-stage regression.

Table 2.5: Results from the first stage fixed effect regression

Explanatory variables	Dependent variable: relative nonfarm income (ratio of nonfarm to farm income)
	Fixed effect coefficients
Age of household head	-0.54 (0.70)
Age of adults in the household	2.74*** (0.20)
Average years of schooling of household head	0.90*** (0.03)
Average years of schooling of adults	0.27*** (0.08)
LFP rate of adults	-1.81*** (0.37)
% of households with access to electricity	0.68* (0.41)
Constant	-8.66** (2.75)
Number of observation	400
F	354.95
Prob > F	0.000

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Table 2.6: Results from second stage fixed effect regression

Explanatory variables	Dependent variable: relative nonfarm participation
	Fixed effects coefficients
Age of adults	-0.57*** (0.13)
Average years of schooling of adults	0.17** (0.08)
Relative nonfarm income (predicted)	0.16*** (0.02)
LFP rate of adults	0.38* (0.22)
% of households with access to electricity	0.88*** (0.31)
Average land size	-0.01* (0.007)
Constant	1.59** (0.52)
Number of observation	400
F	25.17
Prob > F	0.000

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

In the second stage, the predicted value of the relative nonfarm income is used as the explanatory variable, along with other explanatory variables, in the fixed effect regression model of farm-nonfarm employment switch. The results are shown in Table 2.6. Average age of the adults has a negative significant effect and average education of the adults has a positive significant effect on the relative nonfarm participation, suggesting younger and educated adults tend to participate more in the nonfarm activities than in farm activities. A 10 percent decline in the average age of adults and a 10 percent increase in the average years of schooling of the adults lead to the rise in the relative nonfarm participation by 5.7 percent and 1.7 percent respectively. Relative nonfarm income has a positive impact: a 10 percent rise in the relative nonfarm income leads to the rise in relative nonfarm participation by 1.6 percent. The rural LFP rate has a positive effect, as a 10 percent rise in rural adults' LFP rate leads to the rise in relative nonfarm participation by 3.8 percent. Rural infrastructure, as represented by the share of households with access to electricity in total households in the rural area, has a positive impact, as 10 percent rise in such ratio leads to 8.8 percent rise in the relative nonfarm participation. Finally, land holding has a negative impact: a 10 percent rise in the average size of landholding leads to reduction in relative nonfarm participation by 0.1 percent.

Table 2.7: Regression on computed Z-scores from the second stage fixed effect regression

Explanatory variables	Dependent variable: Z score of relative nonfarm participation
	Fixed effects coefficients
Z score of age of adults	-0.54*** (0.12)
Z score of average years of schooling of adults	0.30** (0.14)
Z score of relative nonfarm income (predicted)	0.50*** (0.08)
Z score of LFP rate of adults	0.10* (0.06)
Z score of % of households with access to electricity	0.31*** (0.12)
Z score of average land size	-0.01* (0.005)
Constant	-4.25e-08 (0.03)
Number of observation	400
F	25.28
Prob > F	0.000

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Table 2.7 reports the regression on computed z-scores of the variables in the second stage regression from Table 2.6. It is found that as far as employment in the rural nonfarm sector relative to the farm sector is concerned, the largest positive effect comes from the rise in the relative nonfarm income followed by the improvement in rural infrastructure and education of adults, and the largest negative effect stems from age of the adults.

Conclusion

Notwithstanding its falling share in economic output, agriculture still accounts for the major share of employment in Bangladesh. As employment generation in the formal urban manufacturing sector is mostly concentrated in the textile and garment sectors, where an overwhelming majority of wage laborers are women as against of a male-dominated rural farm labor market, the traditional theoretical argument of formal manufacturing sectors pulling rural laborers may not be forthcoming although the 'push factors' continue to generate migration to urban areas. On the other hand, the capacity of agriculture in absorbing additional labor force is extremely limited because of declining arable land (due to population pressure), the cropping intensity already reaching the peak, and further technological progress likely to be capital-intensive yielding low-employment elasticity of output. Therefore, the rural-urban labor market linkages would not be enough for productively absorbing the surplus workforce. Rather, it is the rural non-farm economy, which should act as the engine of employment generation.

The analysis in this paper suggests that younger and more educated people participate more in the rural nonfarm sector. Also, improvement in rural infrastructure plays a positive stimulus. Another very important finding is that nonfarm employment offers a higher income potential compared to farm employment which works as a major pull factor for the employment in the nonfarm sector. It also appears that the decline in the landholding works as a major push factor for nonfarm participation.

How does Employment Status Matter for the Wellbeing of Rural Households in Bangladesh?

Selim Raihan and Fatima Tuz Zohora

Introduction

In rural Bangladesh, a great challenge is to tackle the low pay, poor-quality jobs that are unrecognized and unprotected by law, widespread underemployment, the absence of rights at work, inadequate social protection, and the lack of representative voice. There is no denying the fact that, efficient labor markets can contribute to raising the quantity and quality of employment. However, there remains a big question whether poverty in rural Bangladesh is concentrated in certain employment categories. Against this background, this paper examines the link between different forms of employment and wellbeing of rural households in Bangladesh.

This paper uses the data from the Bangladesh Integrated Household Survey (BIHS) of IFPRI. This data are nationally representative data of rural Bangladesh for the year 2011-2012 where the sample size is 6,500 households in 325 primary sampling units (PSUs). The reason for using the BIHS database for this study is that this is the latest available survey data on rural Bangladesh. This study has attempted systematic analysis in understanding the association between employment status and wellbeing of rural households in Bangladesh.

From the BIHS data, the study has used consumption expenditures as the principal indicator of household economic status or wellbeing, and has used per capita consumption expenditure as the proxy for income. The total consumption expenditure is measured as the sum of total food consumption and total non-food expenses excluding lumpy expenditures. Income (expenditure) deciles have been created by dividing the households into ten groups from the lowest to the highest in terms of households' total income. Employment statuses have been constructed for those household heads who are able and eligible to participate in the labor market. By definition, the labor force consists of everyone above the age of 15 who is employed (including individuals working without pay) or unemployed but actively seeking employment. Household head, not counted in the labor force, includes students, retired people, disabled people, and discouraged workers who are not seeking work.

Literature Review

The 2013 World Development Report calls jobs a cornerstone for development that connects living standards, productivity and social cohesion – all critical for achieving inclusive growth (World Bank, 2013). There is also a consensus in economic literature that access to good, steady jobs and living wages are key to alleviate rural poverty in countries like Bangladesh. However, when it comes to using rural employment promotion as a tool for promoting rural development, both the quantitative and qualitative aspects of employment need to be taken into account for promoting both productive employment and decent work in a mutually reinforcing manner. In this regard, it is very important to address numerous types of labor relations and various forms of labor force participation at disaggregated level, which may include wage earners in both farm and nonfarm sectors, self-employed both in farm and nonfarm sectors, unpaid family workers, and unemployed.

Several studies emphasized on the link between nature of employment and poverty. Gutierrez *et al.* (2007), using a sample of 104 short-run growth spells in developing countries between 1980 and 2001, found that, in the short run, though the overall employment intensity of growth did not matter for poverty reduction, the sectoral pattern of employment growth and productivity growth were important for poverty reduction. Krongkaew *et al.* (2006), in the case of Thailand showed that, poverty reduction in Thailand was attained through a combination of high growth and productive employment, and the probability of being poor was related to farm income, place of

residence, household size, and male household head. In the case of rural employment and poverty, Chadha (2008) and Kumar et al. (2011) found that increased employment in the rural nonfarm sector had a significant positive effect on reducing rural poverty in India.

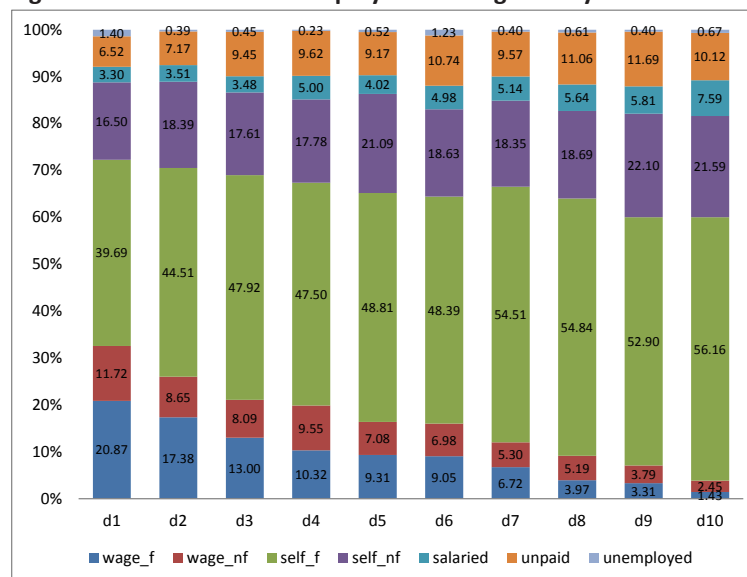
Mahmud (1996) observed that, in the case of Bangladesh, the process of labor shift from agriculture to rural nonfarm sector showed an uncertain balance of the “push versus pull” factors that might have kept rural poverty situation from deteriorating, without making much improvements in the situation either. Rahman and Islam (2003) found that, the poor in Bangladesh were more likely to be casual workers and are were in informal sectors, and the probability of a household being poor decreased with the increase in employment in nonfarm sectors. The study also found that, wage-workers were more prone to poverty than the self-employed. In addition, Rahman (2004) observed that those in wage employment in agricultural sector faced higher chances of poverty due to the lower average income of wage employed compared to that of self-employed. The study suggested that, rural nonfarm self-employment should be an important mechanism for improvement of income of those closer to the poverty threshold. Furthermore, the study by Islam (2004) showed that, the shift from agriculture to manufacturing sector had positive implication on reducing poverty, but agriculture also had a prominent role in pro-poor growth in developing countries. The study argued that relative prices of agricultural products with respect to non-agricultural products would be an important factor for pro-poor growth. Osmani and Latif (2013) investigated the major determinants of poverty for the year 2000 to 2010 in Bangladesh and found that, poverty reduction was more for the self-employed and nonfarm workers than that for agricultural wage labors.

Overview of Pattern of Employment and Wellbeing in Rural Bangladesh

Distribution of employment categories

The distribution of the different employment categories in the labor force is shown in Figure 3.1. In the x-axis is 10 deciles are organized in ascending order on the basis of monthly consumption expenditure of the rural households. Therefore, first decile is the poorest one and the 10th decile is the richest one. The figure summarizes that, while wage employment is mostly concentrated in the poorer deciles, self-employment is concentrated mostly in the richer deciles. Salaried employed maintains smaller shares among poorer deciles.

Figure 3.1: Distribution of employment categories by income deciles



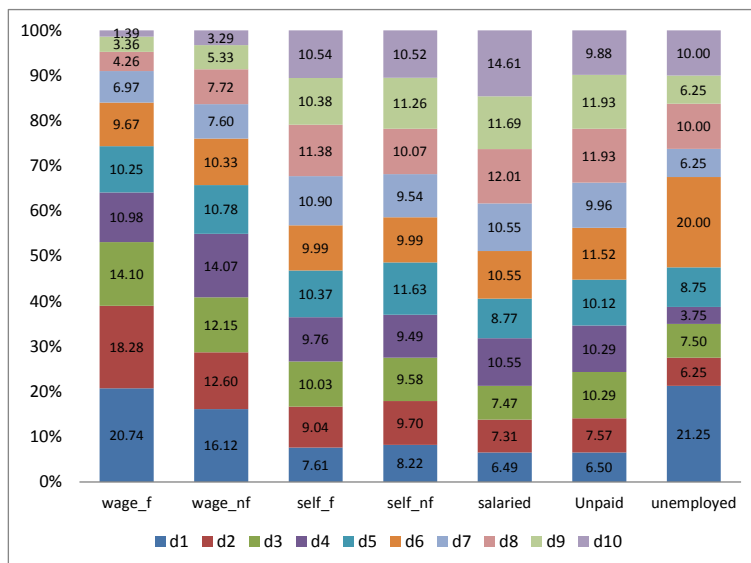
Note: di = deciles, where i = 1, 2,..., 10

wage_f = wage employment farm; wage_nf = wage employment nonfarm; self_f = self-employment farm; self_nf = self-employment nonfarm; salaried = salaried employment; unpaid = unpaid family job; unemployed = unemployed

Source: Calculated from the Bangladesh Integrated Household Survey (BIHS) data of IFPRI 2011-12

Figure 3.2 presents the distribution of deciles by employment categories in the rural area. Individuals who work as wage labor are mostly from poorer deciles. More than 50 percent of total wage employment in the farm sector are from the poorest three deciles. In the case of wage employment in the nonfarm sector, around 40 percent are from the poorest three deciles. In case of self-employment, for both the farm and nonfarm sectors, the distributions of 10 deciles are largely even and similar. For both these categories of employment, the bottom three deciles have around 27-28 percent shares. Salaried employment is mostly from decile 4 and above. Unpaid family job is mostly from decile 3 and above. In the unemployed category, decile 1 has the highest share (21.3 percent) followed by decile 6 (20 percent).

Figure 3.2: Distribution of income deciles by employment categories



Note: di = deciles, where i = 1, 2,..., 10

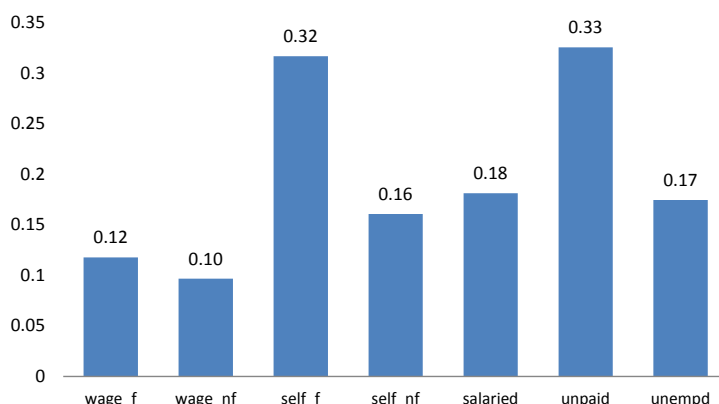
wage_f = wage employment farm; wage_nf = wage employment nonfarm; self_f = self-employment farm; self_nf = self-employment nonfarm; salaried = salaried employment; unpaid = unpaid family job; unemployed = unemployed

Source: Calculated from the Bangladesh Integrated Household Survey (BIHS) data of IFPRI 2011-12

Land ownership and employment categories

Figure 3.3 shows the average landholding per capita by employment categories in the rural areas of Bangladesh. People who are unpaid have the highest per capita land (0.33 acres) followed by people working as self-employed in the farm sector (0.32 acres). People employed as wage workers, both in the farm and nonfarm sectors, have the least per capita land, 0.12 and 0.10 acres respectively. Self-employed people in the nonfarm sector, salaried and unemployed people have per capita land holdings of 0.16, 0.18 and 0.17 acres respectively.

Figure 3.3: Average landholding per capita (acres)

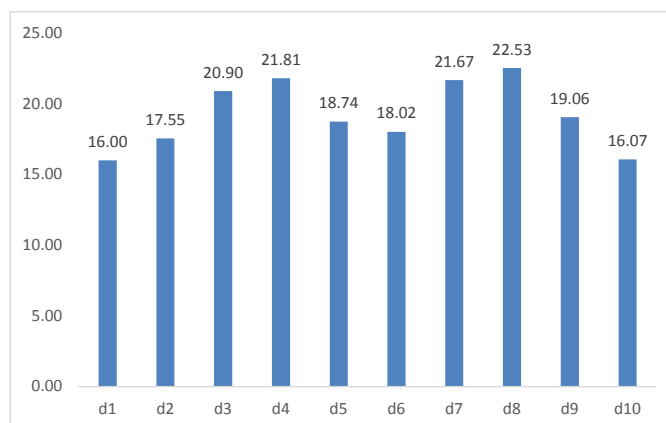


Note: wage_f = wage employment farm; wage_nf = wage employment nonfarm; self_f = self-employment farm; self_nf = self-employment nonfarm; salaried = salaried employment; unpaid = unpaid family job; unempd = unemployed

Source: Calculated from the Bangladesh Integrated Household Survey (BIHS) data of IFPRI 2011-12

Figure 3.4 shows the figures of land income as percentages of households' total income for different income deciles. The poorest decile has the lowest share of 16 percent. This share has an increasing trend up to the 4th decile with a figure of around 22 percent for that income decile. With some fall in the share for decile 5 and decile 6, the share rises to around 22 percent for both decile 7 and decile 8. For the top income decile, the share is little over 16 percent.

Figure 3.4: Percentage of land income in total income



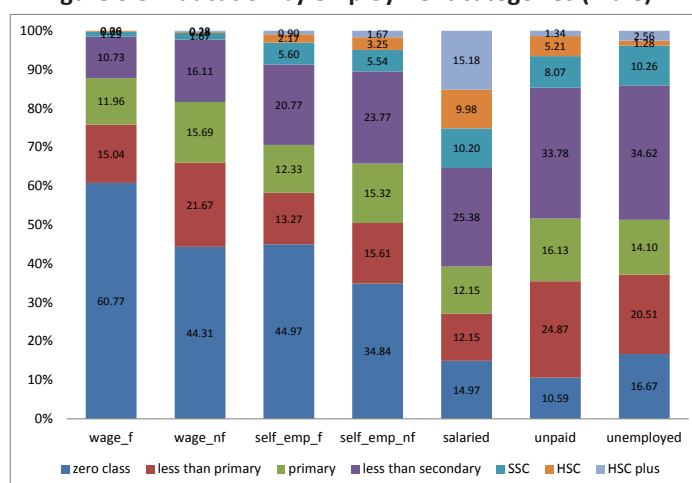
Note: di = deciles, where i = 1, 2,..., 10

Source: Calculated from the Bangladesh Integrated Household Survey (BIHS) data of IFPRI 2011-12

Education and employment categories

Figures 3.5 and 3.6 show the educational status of the male and female workers by employment categories in the rural areas. Males with no education seem to be highly concentrated in wage employment in both farm and nonfarm sector. They are also densely present in self-employment activities. In the salaried employment category, the dominant share is of the males with less than secondary level but higher than primary education. However, males with HSC and beyond HSC account for around 25 percent of the salaried employment.

Figure 3.5: Education by employment categories (male)

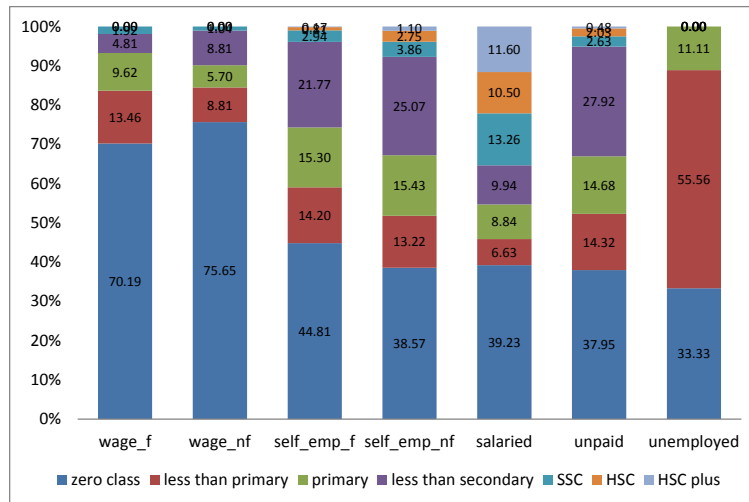


Note: wage_f = wage employment farm; wage_nf = wage employment nonfarm; self_f = self-employment farm; self_nf = self-employment nonfarm; salaried = salaried employment; unpaid = unpaid family job; unemployed = unemployed

Source: Calculated from the Bangladesh Integrated Household Survey (BIHS) data of IFPRI 2011-12

On the other hand, females with no education seem to be highly concentrated in wage employment (Figure 3.6). Females with less than primary education have a dominant share in the case of unemployed (55.56 percent). In the case of the unpaid family job for the female adults, around 28 percent of them are with less than secondary but higher than primary education.

Figure 3.6: Education by employment categories (female)



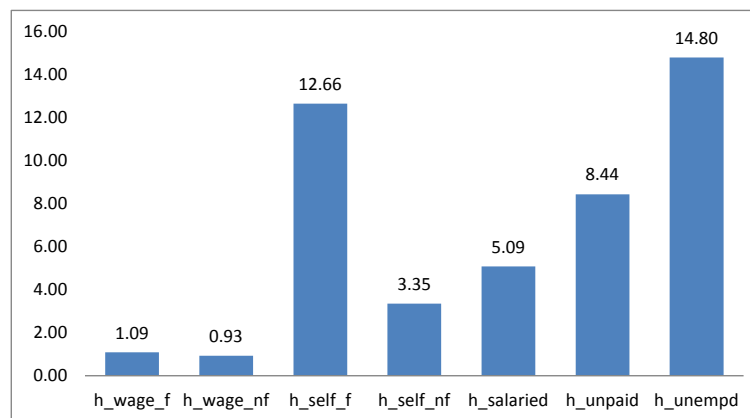
Note: wage_f = wage employment farm; wage_nf = wage employment nonfarm; self_f = self-employment farm; self_nf = self-employment nonfarm; salaried = salaried employment; unpaid = unpaid family job; unemployed = unemployed

Source: Calculated from the Bangladesh Integrated Household Survey (BIHS) data of IFPRI 2011-12

International remittances

Figure 3.7 shows the shares of international remittance income in total income of rural households by heads' employment categories. Households with heads in wage employment, both in farm and nonfarm sectors, have the least shares of remittance income in total income, which is around 1 percent. Households with heads in the farm self-employment have on average the second highest share (12.66 percent). The highest share is actually observed in the case of unemployed category.

Figure 3.7: Percent share of remittance income in total income by household head's employment category

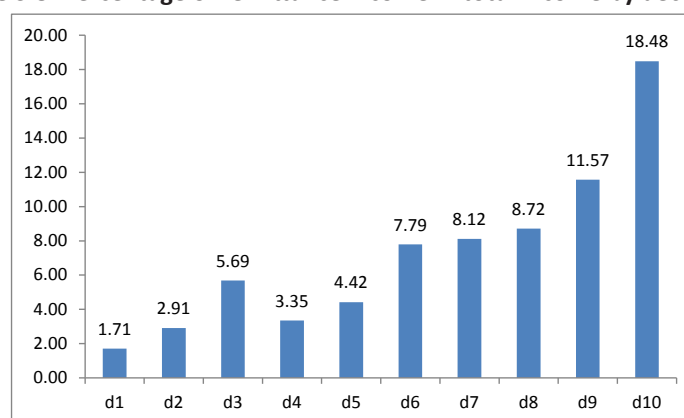


Note: h_wage_f = head's wage employment in farm; h_wage_nf = head's wage employment in nonfarm; h_self_f = head's self-employment in farm; h_self_nf = head's self-employment in nonfarm; h_salaried = head's salaried employment; h_unpaid = head's unpaid family job; h_unemployed = head is unemployed

Source: Calculated from the Bangladesh Integrated Household Survey (BIHS) data of IFPRI 2011-12

Figure 3.8 presents the figures of remittance income share in total income of rural households by income deciles. Remittance share varies between 2 percent and more than 18 percent, where the richest decile having a share of more than 18 percent and the poorest decile having a share of less than 2 percent.

Figure 3.8: Percentage of remittance income in total income by deciles wise



Note: di = deciles, where i = 1, 2, ..., 10

Source: Calculated from the Bangladesh Integrated Household Survey (BIHS) data of IFPRI 2011-12

Does Employment Status Matter in Rural Wellbeing? Insights from Econometric Exercises

In order to investigate the factors affecting wellbeing of rural household in Bangladesh the paper has used the cross section multinomial logistic regression models. The income status of the household is considered as the dependent variable, where per capita consumption expenditure is used as a proxy for households' income status. For the explanatory variables, the paper has used different categories of employment of household head e.g. wage labor in the farm and nonfarm sector, self-employed in the farm and nonfarm sector, salaried worker and unpaid worker; all of these are dummy variables, where 'unemployed' has been considered as the base employment status. Other explanatory variables are age of household head, years of education of the head, number of dependent members per household, per capita landholding and a dummy variable on whether the household receives international remittance or not.

To compare the regression result with the base income category the paper has used the method of relative probability calculation; parameters with statistically significant coefficients greater than 1 have higher probabilities than the base category, and parameters with statistically significant coefficients less than 1 have low probabilities than the base category. To see the regression results in the probability scale, marginal effects of the coefficients are also presented in this paper rather than the actual coefficient values.

Comparison with respect to the base category

The results, using decile 1 as the base category, are presented in Table 3.1. It appears that wage employment in the farm sector has statistically significant association with all income deciles between 6 and 10. However, such employment status doesn't have any statistically significant association with income deciles between 2 and 5. For a wage worker in the farm sector, relative probabilities to be in deciles 6, 7, 8, 9 and 10 are respectively 39 percent, 44 percent, 75 percent, 85 percent and 90 percent lower than to be in decile 1. The result depicts the fact that wage employment in the farm sector are more concentrated among the poorer households and doesn't play any pivotal role in shifting up the status of a household. The result is quite analogous for the wage-employed in the nonfarm sector too: if the household head is employed in nonfarm activities, the relative probability to be in the deciles 9 and 10 are 62 percent and 78 percent lower (respectively) than to be in decile 1.

Table 3.1 suggests that in case of self-employment, if the household head is engaged in the farm sector, the relative probability of that household to be in decile 10 is 44 percent lower than to be in the base decile 1. This association is insignificant for all other deciles meaning that, self-employment in the farm sector does not necessarily improve the income status. On the contrary, if the household head is self-employed in the nonfarm sector, the relative probabilities to be in deciles 3, 4, 5, 6, 7, and 8 compared to the base category are higher by 90 percent, 86 percent, 124 percent, 84 percent and 72 percent respectively. It shows that, self-employment in nonfarm sector has a strong transitory power to improve household wellbeing. In addition to these, when consid-

ering salaried employment, the study finds no significant influence of salaried employment over shifting the well-being status from income decile 1 to higher income deciles. On the other hand, if the household head is employed as an unpaid worker the relative probability to be in deciles 8, 9 or 10 is more than 80 percent lower than to be in the decile 1.

In Table 3.1, among other variables, household characteristics like age of the head, dependent member per household, per capita land holding and remittance status hold significant impact on the nature of economic status of the household. If the age of the household head increases by one additional year, the relative probability to be in the top four deciles compared to the decile 1 increases by around 1.2 percent point. It is also seen that, with the rise in number of dependents in a family the relative probability of the household to be in a higher decile compared to decile 1 becomes lower. For example, if number of dependents in a family increases by 1 additional person, the relative probability to be in decile 2 compared to decile 1 is 25 percent lower. Whereas, if the number of dependent increases by 1 additional person the relative probability to be in decile 10 compared to decile 1 is 70 percent lower.

The results in Table 3.1 also suggest that, education and international remittances play a role of pull factor in case of shifting household status from the lowest decile to upper deciles. An increase in the years of education of the household head by one additional year increases the relative probability to be in decile 2 compared to decile 1 by 10 percent point; whereas, for the same increment, the relative probability to be in decile 10 compared to decile 1 increases by 35 percent. In case of remittances, households that receive remittance have more than 3 fold relative probability to be in decile 4 or above. For the remittance receiving households, the relative probability to be in decile 10 compared to decile 1 is more than 25 times higher than a household that does not receive remittances. Along with these, per capita land holding appeared as an important household characteristics that can help a household to be on the higher deciles.

Table 3.1: Ratio of relative probabilities from multinomial logistic regression (base: decile 1)

Explanatory variables	Dependent variable: Income status								
	Income deciles								
	2	3	4	5	6	7	8	9	10
Farm wage employment	1.120 (0.249)	0.988 (0.262)	0.714 (0.264)	0.688 (0.268)	0.612* (0.262)	0.455*** (0.272)	0.254*** (0.290)	0.153*** (0.301)	0.096*** (0.352)
Nonfarm wage employment	0.925 (0.278)	1.119 (0.289)	1.278 (0.281)	1.004 (0.291)	0.820 (0.289)	0.826 (0.293)	0.711 (0.295)	0.377*** (0.310)	0.223*** (0.367)
Farm self employment	1.126 (0.253)	1.478 (0.259)	1.318 (0.256)	1.447 (0.257)	1.143 (0.250)	1.253 (0.247)	1.166 (0.244)	0.698 (0.236)	0.660* (0.240)
Nonfarm self employment	1.423 (0.253)	1.903** (0.261)	1.860** (0.258)	2.240*** (0.258)	1.840** (0.252)	1.687** (0.253)	1.717** (0.250)	1.326 (0.241)	1.328 (0.246)
Salaried employment	0.692 (0.393)	1.013 (0.389)	1.295 (0.367)	0.908 (0.388)	1.309 (0.358)	1.246 (0.361)	1.229 (0.356)	0.618 (0.358)	0.787 (0.354)
Unpaid family labor	0.000 (960.37)	0.335 (0.888)	0.000 (1031.3)	0.000 (1027.4)	0.000 (1057.1)	0.000 (1075.9)	0.187* (0.969)	0.193* (0.898)	0.056** (1.125)
Household head's age	1.006 (0.004)	1.008* (0.004)	1.005 (0.004)	1.006 (0.004)	1.005 (0.004)	1.010** (0.004)	1.012*** (0.004)	1.013*** (0.004)	1.013*** (0.004)
Number of dependent members per household	0.756*** (0.044)	0.700*** (0.045)	0.624*** (0.047)	0.573*** (0.048)	0.533*** (0.049)	0.509*** (0.050)	0.470*** (0.052)	0.414*** (0.054)	0.306*** (0.060)
Years of education of the head	1.104*** (0.020)	1.118*** (0.020)	1.146*** (0.020)	1.164*** (0.020)	1.182*** (0.020)	1.209*** (0.020)	1.219*** (0.020)	1.308*** (0.020)	1.353*** (0.020)
Per capita landholding	7.711*** (0.544)	37.22*** (0.507)	51.81*** (0.502)	55.22*** (0.500)	97.09*** (0.492)	171.4*** (0.483)	173.5*** (0.483)	246.9*** (0.480)	369.4*** (0.479)
Dummy for international remittance (1= recipient)	2.545** (0.444)	4.577*** (0.418)	4.494*** (0.423)	5.655*** (0.416)	8.770*** (0.405)	12.120*** (0.399)	14.407*** (0.397)	18.036*** (0.397)	26.039*** (0.397)
Constant	-0.138 (0.328)	-0.499 (0.337)	-0.167 (0.335)	-0.174 (0.338)	-0.044 (0.332)	-0.416 (0.335)	-0.340 (0.333)	-0.287 (0.330)	-0.306 (0.339)
Number of observation	6503								
LR chi2(99)	2592.64								
Prob > chi2	0								
Pseudo R2	0.0866								
Log likelihood	-13677.38								

Note: Coefficients are expressed as the exponentials of the coefficient (e coeff.) from mlogit; ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Hence, the results using relative probability method indicate that, household head who works as wage labor in the farm and nonfarm sector has high relative probability of being in the lower deciles compared to the highest two income deciles. Similarly, household head who is working as a self-employed in the farm sector has a high probability to be in the lower deciles compared to the highest two deciles. Head who works as self-employed in nonfarm sector has high relative probability to be in the income deciles 2 to 8 rather than being in the base income decile 1. However, household head who works as a salaried worker is more likely to be in the middle income group. Being an unpaid head has a significant influence to be in the lowest decile rather than being unemployed head. Besides, increase in dependent member per household linked with a high probability of being in the lower deciles. Increase in years of education, per capita land holding and remittance have significant impact to be in the higher income deciles rather than being in decile 1. To switch from the current income status to the immediate deciles group employment status has no significant role but household characteristic plays an important role.

Average marginal effects result of multinomial logit

From the calculated average marginal effects, reported in Table 3.2, we see that, households with head working as wage labor in the farm sector has significant probability to be in decile 1. On an average, the probability of being in decile 1 increases by 3.7 percentage points if household head is a wage labor in the farm sector, while, the probability of being in decile 1 is 4.2 percentage points lower if the head works as a self-employed in the nonfarm sector. However, head engaged as wage employed in the nonfarm sector, self-employed in the farm sector, salaried worker or unpaid has no significant impact to be in decile 1. In addition, age of head, dependent member per household, education, per capita land holding and remittance status have significant impacts on decile 1. If age of head increases by one year, probability of being in decile 1 decreases by 0.06 percent. On the other hand, if dependent member per household increases by one additional member, the probability of being decile 1 increases by 4 percent. In addition, increase in the years of education or per capita land holding reduces the probability of being in the lowest decile. Analogously, households that receive remittances have lower probability to be in the decile 1.

Table 3.2 also shows that employment status, except wage labor in the farm sector, has no significant relationship with the probability of being in decile 2. The probability of being in decile 2 will increase by 6.1 percentage points on an average if the head is a wage labor in the farm. However, number of dependent person per household, education of the household head, per capita land holding, remittance status of the household have significant impacts on decile 2. On an average, if dependent member per household increases by one, the probability of being in decile 2 will increase by 1.9 percent. On the other hand, one year increase in the education of the household head reduces the probability of being in decile 2 by 0.3 percent. Rise in per capita land holding by one acre reduces the chance of being in decile 2. Remittance receiving households have less chance to be in decile 2 as well. Like decile 2, households with head employed as wage labor in the farm is a significant factor to be in decile 3. Household characteristics like dependent member per household and education of head have significant impact on decile 3. In terms of significance, the result is same for deciles 4 also. Households with head working as wage labor in the farm sector and self-employed in nonfarm sector has significant probabilities to be in decile 5; no other variables have significant effect. None of the employment and household characteristics is significant determinant of being in decile 6.

Table 3.2 also suggests that in decile 7, there is no significant impact of employment status but the number of dependent persons, education level of household head, per capita land holding and remittance receiving status plays a significant role to be in that decile. It is noticeable that the impact of these variables is reverse compared to the poorer deciles. On an average, if dependent member per household increases by one the probability of being in decile 7 will be reduced by 0.5 percent. Instead, one year increase in education of the head will increase the probability of being in decile 7 by 0.1 percent. One acre increase in per capita land holding increases the probability to be in decile 7 by 9.1 percent. Remittance receiving status increases the probability of being in decile 7 by 4.4 percentage points than non-remittance receiving household. For a household head employed in the farm sector the probability of being in decile 8 is lower by 4.8 percentage points. Other employment status has no significant impact on decile 8. Dependent member per household, education, land holding and remittance hold similar impact on decile 8 like decile 7.

Table 3.2: Average marginal effect estimation of the multinomial logit

Explanatory variables	Dependent variable: Income status									
	Coefficients									
(base: decile1)	1	2	3	4	5	6	7	8	9	10
Farm wage employment	0.037** (0.015)	0.061*** (0.016)	0.056*** (0.017)	0.030* (0.017)	0.030* (0.018)	0.024 (0.017)	0.004 (0.018)	-0.048** (0.019)	-0.085*** (0.020)	-0.111*** (0.022)
Nonfarm wage employment	0.010 (0.016)	0.007 (0.018)	0.030 (0.019)	0.046** (0.018)	0.024 (0.019)	0.008 (0.019)	0.013 (0.019)	0.002 (0.019)	-0.052*** (0.020)	-0.091*** (0.023)
Farm self employment	-0.014 (0.015)	-0.001 (0.015)	0.026 (0.016)	0.015 (0.016)	0.025 (0.016)	0.003 (0.014)	0.014 (0.014)	0.008 (0.013)	-0.038*** (0.011)	-0.038*** (0.010)
Nonfarm self employment	-0.042*** (0.015)	-0.010 (0.016)	0.017 (0.017)	0.014 (0.016)	0.032** (0.016)	0.013 (0.015)	0.004 (0.015)	0.006 (0.014)	-0.018 (0.012)	-0.016 (0.011)
Salaried employment	0.001 (0.022)	-0.035 (0.026)	0.002 (0.025)	0.026 (0.023)	-0.008 (0.025)	0.028 (0.021)	0.023 (0.021)	0.022 (0.020)	-0.043** (0.018)	-0.017 (0.016)
Unpaid family labor	0.860 (24.40)	-0.654 (85.23)	0.794 (24.59)	-0.669 (94.32)	-0.669 (94.03)	-0.708 (96.89)	-0.747 (97.54)	0.691 (22.82)	0.647 (21.26)	0.455 (19.05)
Household head's age	-0.0006** (0.0002)	0.000 (0.0002)	0.0001 (0.0002)	-0.0002 (0.0002)	-0.0001 (0.0002)	-0.0002 (0.0002)	0.0001 (0.0002)	0.0003 (0.0002)	0.0004 (0.0002)	0.0003 (0.0002)
Number of dependent members per household	0.040*** (0.002)	0.019*** (0.002)	0.015*** (0.002)	0.006** (0.003)	0.00008 (0.003)	-0.004 (0.0031)	-0.005* (0.003)	-0.011*** (0.003)	-0.018*** (0.003)	-0.042*** (0.003)
Years of education of the head	-0.011*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.001 (0.001)	-0.0005 (0.001)	0.0004 (0.0009)	0.001* (0.0009)	0.001** (0.0009)	0.007*** (0.0008)	0.009*** (0.0008)
Per capita landholding	-0.305*** (0.035)	-0.141*** (0.028)	-0.007 (0.021)	0.012 (0.019)	0.008 (0.018)	0.052 (0.015)	0.091*** (0.012)	0.083*** (0.011)	0.096*** (0.009)	0.109*** (0.007)
Dummy for international remittance (1= recipient)	-0.140*** (0.029)	-0.067** (0.022)	-0.021 (0.018)	-0.030 (0.018)	-0.013 (0.017)	0.023 (0.014)	0.044*** (0.012)	0.056*** (0.011)	0.064*** (0.010)	0.083*** (0.009)

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors

According to Table 3.2, the employment status has higher influences over the highest two deciles. If a household head works as a wage labor or a self-employed in the farm sector then that household has less chance to be in the deciles 9 or 10. On an average, if the household head works as a wage employed in the farm sector, the probability of being in deciles 9 or 10 will be lower by 8.5 and 11.1 percentage points. In case of wage labor in non-farm sector, the probability of being in decile 9 and 10 are lower by 5.2 and 11.1 percentage points respectively. Similarly, if household head is self-employed in the farm sector, the probability of being in deciles 9 and 10 will be reduced by 3.8 percentage points. For decile 9, if the head works as a salaried employee, it will reduce the probability of being in decile 9 by 4.3 percentage points. Effectiveness of other variables, like dependency, education, land holding, and remittances over the wellbeing status of the household are also found to be significant for deciles 9 and 10.

Conclusion

The paper aimed to inspect the relationship between nature of employment and wellbeing of rural household in Bangladesh. The paper complements existing literature on the subject of a systematic analysis of rural poverty concentration on certain employment type with the latest available data. The major findings of the paper can be summarized as follows.

First, the wage workers in the rural area are mostly from the poorest deciles. When the head of a household works as wage labor, the relative probability of being in the lower income group is higher than being in the higher income group. This is evident partly from the fact that, employment nature of wage worker requires low skill and minimum education, and is a less effective employment status to bring a major change in the economic wellbeing of the rural people. Whereas the self employed status is a very common employment type in all income groups. Despite capturing a highest employment share in total employment in all deciles, the self employment in the farm is not important employment criteria to switch from one income deciles to another.

Second in the case of self employment in the nonfarm sector, there is a lower chance to be in the poorer income deciles. Household head working as a salaried worker is mostly concentrated in the middle income group. This category is not a significant employment status in switching from one income group to another. The unpaid

household head has a positive link to be in the lower income group. The results appear to support the hypothesis that the nonfarm sector has a crucial role in reducing poverty and increasing the wellbeing of the rural household. Also, to switch from base decile 1 to subsequent deciles, household characteristics (i.e. age, education of the household head, dependent member per household, per capita land holding, and remittance status) act as important determinants.

The findings of the paper provide a significant indication of the sectors coexisting with increasing wellbeing and reducing rural poverty. This further specifies the importance of incorporation of rural concern in national policy along with well-designed employment policies to eradicate poverty highly linked with certain employment categories.

Female Labor Market Participation in Bangladesh: Structural Changes and Determinants of Labor Supply

Simeen Mahmud and Sayema Haque Bidisha

Introduction

Bangladesh has experienced moderately sustained economic growth (annual GDP growth of 6-7 percent) over the last two decades, as well as a fairly rapid demographic transition that began earlier, leading to sustained and steep declines in fertility levels and mortality rates. An accompanying feature of these socio economic trends has been the rising participation of women in the labor market, with the female labor force participation expanding from around 8 percent in the mid-1980s to 30 percent in 2010. While rising female labor force participation in Bangladesh denotes progress for women in a relatively conservative society, and has significant implications for economic growth and poverty alleviation of the country, there remain critical aspects that need examination. First, women's workforce participation is still very low compared to men's, despite the fact that women attach value to having their own independent incomes. Moreover, compared to men, women remain locked into fewer sectors and types of activities that offer fewer hours of employment and lower remuneration. Often, women have little choice but to contribute as unpaid labor to the family enterprise. Second, and related to the first, is that increase in formal school enrolment, better health and lower burden of childbearing (more time) are not translating into secure full time employment, indicating that expansion in participation is supply driven rather than demand driven.

Hence, female labor market participation and its dimensions deserve an in-depth analysis from both an academic point of view and also from a policy perspective. In this paper, we attempt to examine the change over time in the nature of the female workforce and to identify factors affecting the labor supply decision of women in Bangladesh using Labor Force Survey data of several rounds (2005 and 2010 in particular) conducted by the Bangladesh Bureau of Statistics.

Literature Review

In the context of Bangladesh, factors affecting female labor force participation are quite diverse in nature and are often unique to the socio-economic structure of the country. Besides, it is not only within the country, but also across different economic classes that these factors differ. In addition, the research on female labor supply differs from that of male by the inclusion of a number of household specific variables. For example, the impact of family income was considered in the analysis conducted by Blau and Kahn (2006). They measured the impact of wage of both participants and their spouses while controlling for the income from other sources. On the other hand, in order to control for the security of household income, Klasen and Pieters (2013) used the share of household income earned in regular salaried employment and also by the number of underemployed men in the household. In addition to wage and income variables, controls like age, age squared and number of children, were also included in most of the studies. In order to capture their care responsibilities as well as their decision making power, Klasen and Pieters (2013) added a dummy variable which is whether the female is living with the in laws or not. Heim (2007), included cubic in wage, dummies of race and several geographical variables.

A number of studies attempted to understand the linkages between female labor force participation and growth and to analyze the growth implication of women's involvement in labor market. In the context of South Asia, despite the gradual rise in female labor force participation over the decades, there still exists gender gap in labor market participation where the experience is not homogenous-females are lagging far behind males in case of

labor force participation with male labor force participation rate (LFPR) being 84% in the region as opposed to the corresponding figure of 33% for female (World Bank, Gender Statistics). In terms of individual countries, the relationship between income/GDP and LFPR is mixed-on one hand countries like Bangladesh, Nepal or Pakistan have been experiencing moderate increase in female labor force participation with the course of development whereas on the other hand, female labor market participation in India has shown a declining trend with the Sri Lankan experience being mixed. Klasen and Pieters (2012) with the help of Indian data during 1984-2004 found that, despite the recent economic boom, India's growth has not been translated to greater participation of women in the labor force. Lahoti and Swaminathan (2013) used state level employment data for India from 1983-84 to 2009-10 and found no significant relationship between women's labor market participation and economic development. Islam and Rahman (2013), with the Labor Force Survey data of Bangladesh while analyzing the relationship between women's labor force participation and poverty argued that, poorer women might be confined to low-skilled, low paid jobs and poverty can also result in lower productivity and lower bargaining power of women-all of these factors can eventually lead into lower level of wage (Islam and Rahman; 2013).

In the context of Bangladesh, although a few studies attempted to postulate the relationship between labor force participation of women and economic development and growth, the area is not a well-researched one. According to the estimates of the World Bank (2015), if labor force participation of females can be increased from the present level (36 percent) to that equal to men (82 percent) that would result in an increase in GDP growth to as high as 7.5 percent (from the present 5.7 percent). Therefore, female LFPR of 82 percent would result in a 1.8 percentage point increase in GDP growth.

While estimating the determinants of female labor force participation, the most crucial methodological issue that needs to be dealt with is the determination of wage rate. A large number of studies have applied different methods in confronting this challenge. The study of Blau and Kahn (2006) in this regard has analyzed the impact of wage on female labor force participation by estimating two regression equations, where the first one includes the wage of only the women for capturing the *income effect* whereas the second includes the wage of their spouses (if married) for incorporating the impact of spouses' wage on labor force participation. The idea behind treating spouses' income separately comes from the concept of *bargaining model* which predicts that labor and consumption behavior of husbands and wives are separately influenced by their own sources of income (Lundberg and Pollak 1994; Manser and Brown 1980). As they had unpaid participants in the sample, while studying the stagnation of female labor force participation in India, Klasen and Pieters (2013) used predicted wage in the analysis. In studying shrinking wage elasticity of married female labour force, Heim (2007) used predicted wage to capture the impact of wage on participation. We have followed the method described in the seminal work of Mroz (1987). Our study however differs from Mroz by adding an extra step to capture the extensive margins of elasticity. We have used Heckman 2 step procedure to get the selection corrected wage and the wage predicted from that model was used in the next step.

Overview of the Trend and Pattern of Labor Force Participation

Composition of the female and male workforces and trends over time

In Bangladesh although women constitute nearly half of the total population and the economically active population, their representation in the workforce is much smaller, reflecting the far lower rates at which women participate in economic or market activities compared to men. Table 4.1 shows that the female share increased to around 30 percent by 2010. The female LFP rate increased from 25 percent in 1999 to 35 percent in 2010. Compared to the earlier period of 1999-2005 the LFP rate rose faster during 2005 and 2010, averaging an annual increase of one percent in this period. In contrast, the male LFP rate declined slightly from 86 percent in 2005 to 83 percent in 2010, which could be reflecting rising rates of attendance of educational institutions by young men. Hence, there was relatively faster growth of the female labor force compared to the male labor force in this decade.

Table 4.1: Distribution of sample populations for the Labor Force Surveys, 1999, 2005 and 2010

	1999			2005			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total Population	24588 (51.99)	22702 (48.01)	47290 (100)	96122 (51)	92365 (49)	188487 (100)	100820 (50.6)	98451 (49.4)	199271 (100)
Population 15+ (economically active)	14377 (51.48)	13550 (48.52)	27927 (100)	58780 (50.6)	57482 (49.4)	116262 (100)	61260 (49.9)	61414 (50.1)	122674 (100)
Population in LF	12044 (78.19)	3360 (21.81)	15404 (100)	50380 (74.59)	17163 (25.41)	67543 (100)	50838 (70.1)	21650 (29.9)	72488 (100)
Population Employed	11569 (78.90)	3093 (21.10)	14662 (100)	48912 (75.3)	16022 (24.7)	64934 (100)	49578 (70.4)	20875 (29.6)	70453 (100)
LFPR (pop in LF/pop 15+)	0.84	0.25	0.55	0.86	0.30	0.58	0.83	0.35	0.59

Note: Figures in brackets are percentages.

Source: LFS various years

Women's participation in the labor market is considered to depend upon three sets of factors: to some extent upon individual market endowments (age and education level in response to existing labor demand); upon their household situation (marital status, presence of small children, head's occupation) which determines the labor time allocated to domestic/care work; and upon characteristics of the household head (sex, education, occupation) which determines the extent to which the norms of the 'female home maker' and 'female seclusion' are adhered to within the family.

Table 4.2: Male and female labor force participation rates according to selected individual characteristics

	1999		2005		2010	
	Male	Female	Male	Female	Male	Female
Labor force participation rate	0.83	0.25	0.86	0.30	0.83	0.35
<i>Age</i>						
15-24	0.62	0.26	0.67	0.22	0.62	0.36
25-34	0.94	0.28	0.96	0.35	0.93	0.44
35-44	0.98	0.26	0.98	0.36	0.97	0.46
45 and above	0.84	0.18	0.86	0.27	0.83	0.18
<i>Marital Status</i>						
Unmarried	0.63	0.29	0.67	0.19	0.61	0.28
Married	0.93	0.24	0.94	0.31	0.91	0.38
Separated/wid/div	0.43	0.27	0.55	0.32	0.47	0.21
<i>Highest class passed</i>						
No education	0.90	0.26	0.93	0.33	0.90	0.32
Class i-v	0.91	0.24	0.93	0.30	0.90	0.38
Class vi-viii	0.79	0.21	0.88	0.26	0.86	0.42
Class ix-x	0.79	0.21	0.76	0.21	0.69	0.37
SSC/equivalent	0.68	0.23	0.68	0.22	0.67	0.34
HSC/equivalent	0.68	0.23	0.67	0.26	0.50	0.25
Bachelor/equivalent	0.77	0.33	0.82	0.43	1.00	1.00
Master/equivalent			0.88	0.51	0.81	0.48
Medical/engineering degree			0.84	0.61	0.76	0.47
Technical/vocational education			0.77	0.37	1.00	1.00
Others			0.63	0.42	0.69	0.45
<i>Literacy</i>						
Literate	0.80	0.23	0.81	0.26	0.79	0.37
Not-literate	0.91	0.26	0.92	0.33	0.90	0.33

Source: LFS various years

In this context, Table 4.2 presents labor force participation (LFP) rates in 1999, 2010 and 2005 according to selected individual socio economic and demographic characteristics. Women aged 25-44 years had the highest LFP rates, followed by younger women aged 15-24 years, while older women (45+ years) had the lowest rates. Since 1999, the LFP rate had increased for women of all age groups, except older women aged 45+ years, who experienced a rise in 2005 and then a decline. The greatest increase was recorded for women aged 25-44 years. Thus, the relationship between LFP rate and age was an inverted J in 2010, with LFP rates of the youngest women (aged 15-24 years) being higher than that of older women (aged 45+ years). In 2010, currently married women had higher LFP rates (38 percent) compared to either single women or widowed/separated/divorced (WSD) women. Over the years the LFPR increased most visibly among married women.

With respect to education level, the highest LFP rate in 2010 was among women with a BA degree or above, followed by women having 6-9 years of schooling. The lowest LFP rate was for women having a HSC or equivalent degree, much lower compared to the LFP rate among women with no education. Since 1999 LFP had increased for women with all education levels, with the least for women having a HSC degree. In fact, LFP increased most visibly among women with 6-8 years of schooling (from 21 to 42) and for women with a graduate degree and above. Thus, the earlier U shaped relationship, with lowest participation rates among women having secondary education or with SSC/HSC degrees, had given way to a more complex relationship in 2010. In summary, younger women (15-25 years) were entering the labor market at a faster pace than older women (44+ years), but greatest increase in LFP was for married women in the prime working age group (25-44 years).

Besides individual endowments, household circumstances are also important determinants of female supply, either constraining or supporting women's labor supply for market work, by their impact on women's time allocation for 'care work' and household tasks and the household need for income. According to Table 4.3 in 2010 presence of small children (under 6 years) did not appear to affect women's LFP in either time period. The LFP had increased generally for women in all head's education group. In 2010 the head's education up to the SSC level did not appear to have any association with female LFP rate, which hovered around 35-38. However, when the head had a HSC or higher degree there was a dip in the female LFP rate. The pattern was different in 1999, when LFP rate was relatively higher for women when the head had the highest education level (over BA degree).

With respect to household socio economic status, measured by main source of household income and household landownership, the patterns were a bit complicated in 2010. In households where self-employment (both in agriculture or non-agriculture) was the primary source of income, women had far higher participation rates compared to households with primary income either from service or labor selling. In landless and marginal households women had lower participation rates than in small/medium landed households and also relatively lower compared to women in large landed households. These two factors could be correlated though.

Table 4.3: Male and female labor force participation rates according to household characteristics

	1999		2005		2010	
	Male	Female	Male	Female	Male	Female
Labor force participation rate	0.83	0.25	0.86	0.30	0.83	0.35
<i>Sex of the household head</i>						
Male headed household	0.84	0.23	0.86	0.29	0.84	0.36
Female headed household	0.72	0.46	0.76	0.41	0.66	0.29
<i>Presence of small children</i>						
Without children under 5	0.79	0.25	0.82	0.31	0.79	0.35
With children under 5	0.89	0.24	0.90	0.29	0.88	0.36
<i>Highest class passed by head</i>						
No education	0.88	0.28	0.90	0.34	0.87	0.35
Class i-v	0.86	0.24	0.87	0.28	0.84	0.37
Class vi-viii	0.83	0.23	0.84	0.27	0.81	0.35
Class ix-x	0.80	0.20	0.83	0.26	0.77	0.38
SSC/equivalent	0.75	0.21	0.77	0.23	0.75	0.35
HSC/equivalent	0.74	0.19	0.74	0.23	0.68	0.30
Bachelor/equivalent	0.72	0.23	0.73	0.26	0.80	0.30
Master/equivalent	0.67	0.31	0.77	0.29	0.71	0.27
Medical/engineering degree	0.58	0.32	0.81	0.28	0.73	0.25
Technical/vocational education			0.77	0.29	0.81	0.24
<i>Main source of Income of HH</i>						
Self-employed (agriculture)	0.84	0.25	0.86	0.30	0.83	0.57
Self-employed (non-agriculture)	0.85	0.22	0.88	0.28	0.86	0.61
Service	0.82	0.26	0.80	0.29	0.78	0.19
Day labor	0.94	0.27	0.93	0.34	0.91	0.16
Others	0.78	0.27	0.66	0.28	0.53	0.19
<i>Landownership</i>						
Landless	0.89	0.31	0.90	0.32	0.88	0.32
Marginal	0.86	0.24	0.87	0.30	0.84	0.29
Small	0.81	0.22	0.84	0.28	0.80	0.43
Medium	0.71	0.19	0.80	0.28	0.76	0.44
Large	0.77	0.22	0.78	0.31	0.72	0.38

Source: LFS various years

In Table 4.4 further information about women's engagement in the labor market has been described. In both 2005 and 2010 the agriculture sector (including forestry and fishing) employed more than two thirds of the female workforce. The second important industry category for women was manufacturing, accounting for 11 percent of female employment in 2010, up from 9 percent in 2005, followed by wholesale and retail trade, and the activities of private household sector. Between 2005 and 2010 slowly expanding industries included manufacturing, retail trade activities, transport and storage, and construction, while shrinking industries were public administration, education and health services, possibly reflecting a squeezing of public sector service employment. There were negligible proportions of women employed in other sectors e.g. financial and insurance services, real estate activities, professional and scientific activities, public administration and defense etc. Hence, there was visible segregation in the female labor market by industry category, which had not diminished between 2005 and 2010.

Contributing unpaid family worker was the overwhelming employment status for women, accounting for around 57 percent of female employment in both 2005 and 2010. Not only that, employed women were less likely in 2010 compared to 2005 to be either in salaried jobs (paid employee either regular or irregular) or in waged work as day laborers. On the other hand, they were more likely to be self-employed (employers or own account workers) in 2010 compared to 2005, while the proportion of domestic workers remained unchanged. Thus, the route to expansion in the female workforce and increase in female labor force participation rate was through self-employment rather than waged/salaried employment. Additionally, even with a workforce that was expanding with the entrance of relatively more educated and younger women the dominant type of employment for women remained unpaid family work.

Table 4.4: Distribution (%) of employed women

	2005	2010
Total number of female employed	16022	20875
(% in parenthesis)	(100)	(100)
<i>Share in key Industry (%)</i>		
Agriculture, forestry and fishing	68.06	66.49
Manufacturing	8.98	10.74
Construction	1.03	1.47
Wholesale retail trade, repair	4.1	6.22
Transportation and storage	0.49	1.23
Financial and insurance activities	0.82	0.28
Professional, scientific and technical activities	0.01	0.14
Administrative and support service	0.11	0.26
Public admin, defense, social security	1.24	0.23
Education	3.46	1.97
Activities of households as employers	9.83	9.24
<i>Status in employment categories (%)</i>		
Paid employee (regular or irregular worker)	11.40	9.54
Employer, self employed	21.26	25.75
Unpaid Family Worker	58.79	57.14
Day labor (agriculture or non-agriculture)	6.20	5.24
Domestic Worker	2.36	2.32
<i>Share of types of occupation (%)</i>		
Employer/self employed	21.26	25.75
Unpaid	58.79	57.14
Waged/salaried	19.96	17.10
<i>Share of sectors of employment (%)</i>		
Formal	9.47	10.48
Semi-formal	5.04	2.14
Informal	85.51	87.38

Source: LFS various years

What Determines Female Labor Supply in Bangladesh?

Estimation of the determinants of labor force participation

Here, we want to understand how labor force participation of a woman is influenced by different socio-economic and demographic factors. Given the dependent variable is a dichotomous one (1 if the respondent participates in the labor force and 0 otherwise), the most appropriate estimation technique is that of probit/logit. As shown in

column 2 of Table 4.5, education has strong positive impact on labor market participation and all three education dummies have come out to be statistically significant with positive coefficient estimates. Another crucial determinant of labor market participation of females that distinguishes their decision from that of males is child bearing and subsequent involvement in care activities. As discussed, age of the child can also affect participation decisions as relatively younger children require more attention and therefore can act as a discouraging factor for a woman to participate. According to our results, the presence of younger children less than 6 years of age acts as an obstacle towards female labor market participation- children under 6 years of age reduces female LFP by around 3.6 percent. On the other hand, our estimate shows that the coefficient of total number of children in the household increases participation. This result might have resulted from the fact that, greater number of children increases the financial requirements of a household and as a consequence induces a woman to join the labor market. As shown in column 2 of Table 4.5, higher family income has significantly negative impact on participation and it reduces participation probability by around 7 percent. Possession of land by a household, on the other hand increases the probability of participation-the magnitude of the coefficient is however quite small.

Table 4.5: Results of participation equation (without and with wage)

Column 1	Column 2	Column 3
Variable	Participation (without wage)	Participation (with wage)
Imputed wage		0.084*** (0.004)
Age	0.016*** (0.001)	0.036*** (0.001)
Age ²	-0.0003*** (0.000)	-0.0006*** (0.000)
Primary and secondary passed	0.057*** (0.006)	0.122*** (0.007)
SSC and HSC passed	0.124*** (0.013)	0.163*** (0.013)
University passed	0.577*** (0.018)	0.542*** (0.021)
Marital status	-0.130*** (0.010)	-0.130*** (0.010)
Child	0.004* (0.002)	0.005* (0.002)
Child under 6 years	-0.036*** (0.003)	-0.036*** (0.003)
Net family income (natural log)	-0.069*** (0.001)	-0.069*** (0.001)
Household land	7.26E-05*** (0.000)	7.26E-05*** (0.000)
Urban	0.119*** (0.006)	
Living with in-laws	-0.036*** (0.007)	-0.036*** (0.007)
Head primary and secondary passed	0.001 (0.001)	0.001 (0.006)
Head SSC and HSC passed	0.005 (0.010)	0.005 (0.010)
Head university passed	-0.037** (0.015)	-0.037** (0.015)
Head employed in agriculture	0.009 (0.005)	0.009 (0.005)
Head self employed	0.476*** (0.004)	0.476*** (0.005)
Chittagong Division	0.051*** (0.009)	0.051*** (0.009)
Dhaka Division	0.087*** (0.009)	0.087*** (0.009)
Khulna Division	0.038*** (0.010)	0.038*** (0.010)
Rajshahi Division	0.042*** (0.009)	0.042*** (0.009)
Sylhet Division	0.010 (0.011)	0.010*** (0.011)
Constant	1.525	-0.729
Pseudo R ²	0.293	0.293
Chi ²	0.000	0.000
N	42646	42646

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Column 2 of Table 4.5 also suggests that if the head of a household has higher education (university degree in this case) then that reduces the probability of participation of a woman belonging to that household. In case of head's occupation, although head's sector of occupation (agriculture vs. non agriculture) has come out as immaterial (insignificant from a statistical point of view) in our analysis, a self-employed household head as opposed to a wage employed one increases participation probability of a woman residing in that household significantly and the large magnitude of head's self-employment coefficient might be a reflection of the fact that, women with self-employed household head are likely to be involved in the labor market with the head and therefore are more likely to be engaged in self-employment activities or in unpaid family work.

Given that the wage received in the market is a crucial determining factor of labor market participation, in column 3 of Table 4.5 we have shown estimation result with wages included in the set of explanatory variables. In order to omit the upward bias of reported wage and to correct for the self-selection bias, we run a selection correction model known as Heckman two-step model where in the 1st step we have estimated a probit model of participation and from this model whereas in the next step, while utilizing information from the 1st step, *imputed wage* is calculated and used in estimation. As shown in column 3 of Table 4.5, wage has a strong positive impact

on participation decision whereas In terms of other coefficient estimates, the results of the participation model with wage show very similar estimates to the one without wage.

Estimation of the determinants of employment status

While analyzing labor market experience of women, in addition to labor force participation, it is also important to understand the types of jobs with which they are engaged. This is particularly of interest because it is not only mere participation but also associated wage, job security, pension and other benefits etc. that frames labor market status of a woman. In Table 4.6 the estimation results of a Multinomial Logit Model with 4 categories of employment status has been shown where the categories are: (i) unpaid family worker (category 0); (ii) regular wage employment (category 1); (iii) irregular wage employment (category 2) and (iii) self employment (category 3). Here, unpaid family workers are chosen as the base category.

Table 4.6: Determinants of the choice of employment (multinomial logit model)

Column 1	Column 2	Column 3	Column 4
Variable	Regular employment	Irregular employment	Self-employment
Imputed wage	0.546*** (0.046)	0.567*** (0.081)	-0.154*** (0.039)
Age	0.178*** (0.017)	0.163*** (0.030)	0.230*** (0.016)
Age ²	-0.002*** (0.000)	-0.002*** (0.000)	-0.001*** (0.000)
Secondary level passed	0.229*** (0.081)	-0.072 (0.158)	-0.058 (0.069)
Marital status	-1.392*** (0.098)	-1.106*** (0.157)	-1.014*** (0.098)
Child	0.057* (0.030)	0.078 (0.056)	0.085*** (0.021)
Child under 6 years	-0.234*** (0.051)	-0.315*** (0.100)	-0.247*** (0.038)
Net family income (natural log)	-0.347*** (0.016)	-0.325*** (0.018)	-0.274*** (0.016)
Household land	0.00006 (0.000)	-0.0005 (0.0005)	0.0001 (0.0001)
Living with in-laws	0.069 (0.096)	0.149 (0.178)	-0.067 (0.076)
Head self-employed	-4.091*** (0.077)	-3.815*** (0.138)	-1.180*** (0.085)
Constant	1.659*** (0.521)	-0.589 (0.881)	0.324 (0.477)
Pseudo R ²	0.372		
Chi ²	0.000		
N	13886		

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Estimation results presented in Table 4.6 show that, age, number of children and number of children below 6 years of age, amongst others act as significant determinants in the decision of choice between regular as well as irregular wage employment and self-employment as opposed to unpaid family work. The impact of wage is however not symmetric for the wage employed (regular as well as irregular) and the self-employed and as shown in Table 4.6, when the choice between unpaid family work and self-employment is considered, the impact is found to be negative and insignificant but it is positive and significant in case of both types of wage employment choices. The result of the coefficient estimate of wage in case of wage employment is prior to our expectation. The negative coefficient estimate of wage in self-employment might be related to the fact that we have 'imputed' the wage for unpaid family workers, which might have resulted in *errors in measurement* of wage variable for the unpaid family workers and consequently have affected the sign and significance of related estimated coefficient.

Another interesting result is that of the coefficient of education variable. On one hand, holding a degree of above secondary education acts an important positive factor in choosing the job of regular wage employment as opposed to work as an unpaid family worker. On the other hand, the impact of education is not statistically significant when the decision is in between unpaid family work and self-employment as well as irregular wage employment. Given the informal nature of irregular wage employment as well as self-employment activities, the insignificant estimates of the relevant coefficients cannot be considered surprising or against our prior expectation.

Conclusion

The trend comparisons in the composition of the female workforce indicate that there has been an increase in women's labor force participation in a more mainstream manner to contribute to family incomes and reduce labor cost, compared to earlier when women's market work/economic activity was often undertaken by women without male support or very inadequate male incomes and seen to be more poverty driven.

These findings of this research has important policy implications. First, in terms of research there is not sufficient understanding regarding the demand factors that influence women's employment choice, particularly with regard to the stagnant participation rates in regular salaried work and very slow rise in participation in casual waged work. This suggests a stagnating demand for female labor in the formal sector and very slow increase in demand in the informal sector. Moreover, the continued U shaped relation between female LFP and schooling level with a dip for women having HSC degree could either indicate that labor market returns from participation outside the home or family farm are not sufficiently high or that social barriers keep the opportunity cost of participation high. Both of which can explain why expansion in female LFP is driven by rising participation rates in unpaid work, which increases family welfare but implications for women's empowerment and well being are not immediately apparent.

This brings us to the policy issue. Rising female LFP, whatever the route, can be growth enhancing since more women are spending time in productive activities, and because it means that the 'demographic dividend' of a growing workforce is being reaped to some extent. But the implication of expansion of female LFP as unpaid family labor on women themselves is not clear. No doubt rising social acceptance of women's economic activity and their contribution to family income and welfare, particularly in some regions of the country, is empowering for women. This improves women's social position and their value to family members. It also increases acceptance of women's visibility in the public and enhances women's capabilities such as physical mobility and public exposure. But the extent to which this type of employment has the potential to transform their position within the family and family gender norms remains to be seen. This is because regardless of the type of employment, the one factor that makes the most difference to women's lives in terms of giving them a sense of control over their lives and giving them self esteem is having their own income.

Unpacking Unpaid Labor in Bangladesh

Selim Raihan, Sayema Haque Bidisha and Israt Jahan

Introduction

A common phenomenon of the labor market of Bangladesh is the use of family workers in household productive activities where such works do not get any monetary compensation. Although both men and women get involved in such activities, the proportional involvement of women is much higher than men. This particular mode of labor force participation is however a phenomenon found only in certain South Asian countries and is not a common feature of developed countries with properly functioning labor market.

According to the LFS (2010) as high as 53 percent of the women who were in the labor force were employed as unpaid family workers, where the corresponding figure for men is around 7 percent. In spite of such a significant involvement of work force, non-remunerative nature of such work has made it unrecognized with almost no attention paid by the policy makers or academicians towards its pattern and trend. The huge contribution of this unpaid family work especially in the context of Bangladesh however needs careful and thorough analysis for strategic policy formulation for the labor market. The pattern and trend of unpaid work of Bangladesh also has certain features that have made any analysis on it particularly interesting. For example, unpaid workers are found to have certain degree of education which provokes further analysis to investigate the reasoning behind the *unpaid state* of their labor market participation. Unpaid workers are also found in an overwhelming number in households headed by self-employed males indicating unpaid work more of a choice of household instead of individual. All such features of unpaid work coupled with the presence of overwhelming number of women therefore provoke a careful analysis of it.

This paper, with the help of secondary data and existing literature has made an attempt to shed light on the unpaid component of the labor market in Bangladesh. In particular, with the help of two national level Labor Force Survey data, this paper analyzed the key characteristics of unpaid worker and examined any changes in its pattern that might have occurred over time. It also compared the differences/similarities of different socio-economic as well as household factors in choosing unpaid and paid employment. In order to understand the importance of unpaid work in household income, with the help of a simple methodology, an attempt has been made to estimate the unpaid (/hidden) contribution of unpaid work at household.

Conceptualizing Unpaid Labor in Bangladesh

Over the decades, Bangladesh has experienced consistent rise in economic growth coupled with impressive progress in a number of human development indicators. In case of labor market, probably the most remarkable change has occurred in terms of women's labor market participation-labor force participation of women has climbed up to 36 percent in 2010 from a mere 24 percent in 1999-00. This progress in the labor market has been coupled with reduced maternal mortality, falling fertility, increase in primary and secondary school enrollment of girls, amongst others. In spite of these progresses, due to patriarchal and conservative social structure, women in Bangladesh are typically lagging behind men from both an economic as well as from socio-cultural point of view. In terms of labor market, as high as 70 percent of women are still out of the labor force with a mere 17 percent of female work force engaged in wage employment (LFS, 2010). The quality of employment is also not impressive and that holds true for both men and women as a significant proportion of both men and women (92 percent) work in informal sector without any job security or benefits in work place. Besides, even among the wage employed, most of them work in low skilled jobs with a very small percentage working in highly paid professional occupations.

Another striking feature of the labor market of Bangladesh is the presence of an overwhelmingly large number of family workers who do not get remuneration for their work. These family workers are considered as part of the labor force and their contribution in terms of their work is incorporated in the calculation of national income. In spite of such *informal* recognition, family work cannot be considered as a main stream labor market activity due to its non-monetized nature. According to the definition of labor force survey of Bangladesh, unpaid family work is defined as: “one who works at least one hour in the reference period (other than household work) without pay or profit in a family operated farm or in a business owned/operated by the head or other members of the household to whom he/she is related by kinship, marriage, adoption or dependency.” In the context of Bangladesh, such work commonly includes those of, husking paddy, rearing poultry and livestock, vegetable gardening etc., amongst others.

From a labor market perspective, an individual’s economic contribution primarily can be categorized into three segments: (i) paid (wage and self) employment; (ii) unpaid family work; (iii) unpaid and unrecognized domestic chores-performed mainly by women. Among these three categories, both unpaid family work as well as domestic works are outside of any monetary contribution and therefore are unrecognized. The difference is, the former is counted in the national account and the contributors are included in the labor force whereas the latter completely remains outside of any calculation of the Gross Domestic Product of the country and are not considered as part of labor force. In the context of this paper, we have however focused our discussion only on unpaid family work and have not included unpaid domestic work into this discussion.

As indicated in its name, these works are done in an informal set up, often at home or in a family owned/controlled business entity under the ownership of a relative. Due to its highly informal set up, there is no institutional recognition, fixed work hour or specific payment scheme associated with such job. In most of the cases, unpaid work is associated with households headed by self-employed persons who is involved in either farm or non-farm activities. In such cases, instead of hiring wage labor, she/he often engages his daughter/son/in law/wife in such activity without any remuneration. Certain distinguishing features/stylized facts of unpaid family labor are as follows:

- Certain form of kinship is there with the family worker and the head of the household.
- Unpaid family work is often a rural phenomenon.
- It is more prevalent as a farm activity.
- The work of household head is remunerated but that of unpaid worker is not.
- The prevalence of women is observed in such activities.
- In case of unpaid workers, in most of the cases the household head is self-employed and often possesses land.

The lack of recognition of women’s work primarily arises because these are not monetized. These are also performed either inside houses and/or in an informal setting, making it more difficult to get such work being documented. In this context, lack of data on such work, especially those of household chores often makes the calculation more complex. Furthermore, women often do not realize their contribution and often under report it.

Therefore, unpaid family work although being counted in national income, the worker does not get any benefit out of such work, rather the benefit mainly goes to the household head. Hence, the issue of unpaid work is primarily not of being undocumented but that of discrimination and unequal distribution. Thus, it is important to understand the nature of unpaid work, their characteristics, factors affecting unpaid work etc. Understanding unpaid work is also expected to shed light on the factors hindering them to enter the formal paid employment and would enable the policy makers to understand the pattern and dynamics of labor market as well.

Literature Review

The literature on unpaid work is primarily related to those of domestic work and very few studies have focused particularly on unpaid family work. A number of literatures however focused on defining and understanding unpaid work in the context of national income. Especially in the context of Bangladesh, to our knowledge there is no analysis focusing particularly on unpaid family work.

In global context, Antonopoulos (2009) defined “unpaid work” as all non-remunerated activities which lacks economic recognition. Here the author categorized unpaid work as non-economic or non-SNA activities. The study has also taken non-SNA unpaid work as all household works, care works for family members and all other volunteer work for community services. Latigo and Neijwa (2005) in this regard defined SNA work as both paid as well as unpaid work performed for the market. Non-SNA work, according to them includes non-marketed unpaid work, which are for example household chores, care and voluntary work.

In the context of developing countries, evidences show that an increasing portion of women are getting involved into temporary, casual, seasonal or part time work and quite often in home-based activities. Moreover, a large proportion of working women are working as unpaid labor in family farms and enterprises with no access to an income of their own (Zammit, 2010). According to ILO data (2008), in developing countries majority of women are classified either as own account worker or as unpaid family worker where the former type of work makes up 25 percent labor force in South Asia (the figure for males is 56 percent). As for unpaid family work, the percentage is 59 percent where it is only 18 percent for male.

In the context of India, Ghosh (2009) reported that there is an increasing portion of women in India who are compelled to do unpaid domestic work as they do not have any other alternative. According to the finding of Das (2006), 65 percent of women reported that they are constrained to work at home as there is no other member who can take care of their household work. Therefore, only a third of the women said that they are able to work outside their home.

In the context of Bangladesh, very few research on unpaid work has been carried out and those also focuses on unpaid domestic work not the work of family worker. The research of Khatun et al. (2015) showed that in fiscal year 2013-14, the contribution of the activities of women, that are unaccounted at the national level, was equivalent to 76.8 percent according to replacement cost method whereas it was 87.2 percent according to willingness to accept method. Another study (Efroymson, Biswas and Ruma, 2007) found that the economic value of the work performed by housewives was equivalent to US\$ 69.8- 91 billion per year.

Key Features of Unpaid Labor in Bangladesh

Key individual features of unpaid workers

In the context of Bangladesh, unpaid family worker has constituted a significant part of the labor force and that is particularly true in the case of women. In 2010, as high as 15.8 percent of the labor force was engaged as unpaid worker (LFS 2010). In case of male, although the proportion of unpaid workforce is not that large, as suggested by the LFS of 2005 and 2010, it has constituted more than half of the female labor force.

A closer look at the characteristics of unpaid workers reveals that, unpaid work is primarily a farm based phenomenon and as high as 80 percent of unpaid workers are based on farm based activities (Table 5.1). In the context of Bangladesh, it therefore indicates the possibility that *unemployed* family members of the household are being engaged in farm based activities performed by household head.

Table 5.1: Distribution of unpaid labor by major type of employment

Sectors	2005			2010		
	Total	Male	Female	Total	Male	Female
Farm	80.29	57.10	92.69	80.82	68.29	84.64
Nonfarm	19.71	42.90	7.31	19.18	31.71	15.36
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Labor Force Survey 2005 and 2010

In terms of age distribution, most of the unpaid workers are young and belong to the age group of 15 to 30 years (Table 5.2). However, in recent years the percentage of relatively 'young' unpaid workers increased as in 2005 there was around 55 percent unpaid workers within the age category of 15 to 30 years where the percentage was as high as 71.52 percent in 2010 (LFS, 2005 and 2010).

Table 5.2: Distribution of unpaid worker by age category

Age Category	2005			2010		
	Total	Male	Female	Total	Male	Female
15-20	17.69	39.58	5.99	23.46	36.91	19.37
21-25	20.02	27.83	15.84	26.09	32.23	24.22
26-30	17.5	16.22	18.18	21.97	20.89	22.3
31-35	12.41	8.2	14.66	9.23	4.24	10.75
36-40	10.5	3.94	14.01	8.23	2.12	10.09
41-45	7.37	1.25	10.64	6.46	1.14	8.08
46-50	5.14	0.72	7.51	3.67	0.49	4.63
51-55	3.96	0.47	5.83	0.25	0.27	0.25
56-60	2.23	0.47	3.17	0.22	0.38	0.17
61-65	1.51	0.41	2.09	0.16	0.38	0.09
66-70	0.96	0.35	1.28	0.15	0.57	0.02
Above 70	0.71	0.55	0.8	0.1	0.38	0.02
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Labor Force Survey 2005 and 2010

Data of Labor Force Surveys also reveal that the unpaid workers are not only young but also possess some degree of education (Table 5.3). For example, in 2010 as high as 26 percent of unpaid laborers were found to have primary education, with another 7 percent having even an SSC degree (LFS, 2010). In comparison to previous year (LFS 2005), the proportion of 'educated' unpaid family workers has increased as Table 5.3 reveals that, in 2010 there were around 32 percent of unpaid workers without any education where the corresponding figures in 2005 were 41 percent. This increase of 'educated' unpaid workers may however be the reflection of an overall improvement of national education level supported by a number of government programs.

Table 5.3: Distribution of unpaid worker by level of education

Level of education	2005			2010		
	Total	Male	Female	Total	Male	Female
No education	41.18	19.05	53	31.87	21.76	34.95
Class i-v	25.78	27.63	24.8	26.07	29.34	25.07
Class vi-viii	14.77	21.66	11.08	17.86	20.21	17.14
Class ix-x	9.57	16.04	6.12	13.56	14.74	13.2
SSC	5.66	9.66	3.52	6.91	8.54	6.41
HSC	1.81	3.45	0.94	2.7	3.51	2.46
Bachelor/Masters	1.13	2.38	0.46	0.86	1.58	0.65
Technical/Vocational	0.06	0.08	0.05	0.13	0.27	0.09
Others	0.04	0.06	0.02	0.04	0.05	0.03
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Labor Force Survey 2005 and 2010

Key household characteristics of unpaid workers

Given that unpaid workers are based on family enterprises/farms, household characteristics can be considered to have important implications towards the pattern of unpaid work. The characteristics of household head, in particular can be argued to affect the intensity and type of unpaid work.

In terms of household characteristics of unpaid workers, certain interesting facts have been found. For example, as for the sex of household head, most of the unpaid workers belong to a household headed by males. According to LFS 2010, as high as 97 percent of unpaid male labor and 99 percent of unpaid female labor reside in households headed by males. Similar trend was found in earlier years too (Table 5.4).

Table 5.4: Distribution of unpaid labor by the gender of head

Gender of household head	Male		Female	
	2005	2010	2005	2010
Male headed	95.57	97.47	97.90	99.06
Female headed	4.43	2.53	2.1	0.94
Total	100.00	100.00	100.00	100.00

Source: Labor Force Survey 2005 and 2010

In terms of occupation of household head of unpaid worker, for the male unpaid worker, 85 percent of household heads were found to be self-employed in 2005, where the percentage has risen to 87 percent in 2010 (Table 5.5). For the female unpaid worker, 97 percent (in 2010) were reported to belong to households headed by self-employed male/female.

Table 5.5: Occupation of household head with unpaid worker

Occupation of household head	Male		Female	
	2005	2010	2005	2010
Head unpaid	2.03	2.28	0.35	0.16
Head self-employed	85.21	87.16	65.12	97.08
Head wage employed	4.45	0.11	29.62	0.01
Head unemployed	0.14	0	0.31	0
Head not in labor force	8.17	10.45	4.6	2.75
Total	100.00	100.00	100.00	100.00

Source: Labor Force Survey 2005 and 2010

Table 5.6 shows that in most of the cases, the head of the household of unpaid worker have no education or only primary education and this scenario holds true over the years. In addition, for both male and female unpaid worker we find similar pattern. However, in comparison to earlier years, for both male and female unpaid worker, in recent years there has been an improvement in the education level of household heads (Table 5.6). This can again be a reflection of country wise increased enrolment in primary education.

Table 5.6: Distribution of unpaid labor by the level of education of the heads.

Education level of household head	Male		Female	
	2005	2010	2005	2010
No education	43.19	49.22	50.54	43.80
Class i-v	24.65	24.01	23.07	24.27
Class vi-viii	13.11	11.48	10.21	11.98
Class ix-x	8.76	6.09	6.71	7.97
SSC/equivalent	5.76	5.55	5.11	6.46
HSC/equivalent	2.73	2.42	2.24	3.14
Bachelor degree/equivalent	1.42	0.82	1.35	1.63
Master degree/equivalent	0.29	0.38	0.61	0.57
Medical/engineering degree	0	0.03	0.1	0.06
Technical/vocational education	0.08	0	0.04	0.1
Others	0.02	0	0.03	0.02
Total	100.00	100.00	100.00	100.00

Source: Labor Force Survey 2005 and 2010

Data of labor force survey shows that, the relationship of unpaid worker with the head of the household differs quite remarkably across sexes. As suggested in Table 5.7, female unpaid workers are mostly (71 percent in 2010 and 79 percent in 2005) the wives of the head. Table 5.7 also reveals that, in certain cases, the female unpaid workers also work in the enterprise of their in-laws and in 2010 almost 16 percent unpaid females were found to be the in-laws of the head of the household. On the other hand, the relationship of male unpaid workers with the head is mostly that of sons/daughters and according to 2010 LFS, in 86 percent cases such a relationship was found. In certain cases (8-9 percent case) male unpaid workers also work in the field/business of their brother or sister.

Table 5.7: Distribution of unpaid labor by the relationship status with the head

Relationship with the head	Male		Female	
	2005	2010	2005	2010
Household head	1.33	1.99	0.11	0.1
Spouse	0.35	0.05	79.15	70.55
Son/daughter	83.98	85.5	4.57	8.83
Brother/sister	9.39	8.89	1.03	1.3
Grandson/granddaughter	0.78	0.41	0.11	0.17
Son in law/daughter in law	0.78	0.6	8.66	15.38
Father/mother	1.33	0.95	4.67	0.75
Other relatives	1.33	1.03	1.3	2.58
Non-relatives	0.59	0.27	0.36	0.22
Servant	0.12	0.3	0.03	0.12
Total	100.00	100.00	100.00	100.00

Source: Labor Force Survey 2005 and 2010

In terms of location, the highest concentration of unpaid workers can be found in Rajshahi and Dhaka division with concentration of 24 percent and 22 percent respectively (LFS 2010). The trend was however slightly different in earlier years and in 2005, highest concentration of unpaid workers was found in Chittagong division (25 percent) which has come down to 15 percent in 2010. Previously, Barisal (21 percent) and Khulna (21 percent), instead of Dhaka (13 percent) used to have high percentage of unpaid workers as revealed by the data of 2005 LFS (Table 5.8).

Table 5.8: Geographical distribution of unpaid worker

Divisions	2005			2010		
	Total	Male	Female	Total	Male	Female
Barisal	20.52	22.7	19.36	11.61	10.63	11.9
Chittagong	24.77	22.7	25.87	14.75	14.09	14.95
Dhaka	13.02	13.56	12.73	21.74	20.21	22.2
Khulna	21.02	20.51	21.3	14.02	12.7	14.42
Rajshahi	10.99	9.58	11.74	24.21	23.31	24.49
Sylhet	9.68	10.95	9	13.67	19.06	12.03
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Labor Force Survey 2005 and 2010

The descriptive data analysis of 2005 and 2010 LFS therefore reveals a number of interesting features of the unpaid workers. Although not being remunerated for their ‘productive’ activities, a sizable percentage of unpaid workers were found to have minimum level of education which if not worked as family worker, can be utilized to get remuneration in the main stream labor market. Given the (young) age structure of unpaid workers as suggested by the LFS, a shift from low productive, unremunerated unpaid activities to (relatively) high productive wage employment can be considered to be efficient from both an individual’s view point as well as from the point of view of the economy as a whole. Unpaid workers are mostly found to be engaged in farm activities with self-employed household heads. With the female unpaid workers mostly being the spouse or daughter in law of the head and the males being the sons or brothers of the head, we can infer that the unpaid workers mostly work in the farm of their self-employed husband or self-employed father without any remuneration for their farm activities. Geographically we do not observe any clear pattern of concentration of unpaid workers as the pattern has found to have changed over time.

What Determines Individual’s Decision to Work as an Unpaid Worker? Insights from Econometric Analysis

Given that unpaid workers contribute towards the national income of the country without receiving any remuneration or job related benefits, it is important to understand the factors that affect individual’s decision to work as unpaid worker instead of joining the paid main stream labor market activities. In Table 5.9, with the help of Labor Force Survey data of 2010, results of a multinomial logit model have been shown where we have considered four categories of labor market status of an individual: (i) not in labor force (0); (ii) wage and self-employed/paid employed (1); (iii) unpaid family worker (2); (iv) unemployed (3). Given that an individual chooses among all the available labor market outcomes (which are more than two), the most appropriate model to understand the factors affecting the choice of labor market outcome is multinomial logit model under which a

decision to choose among more than two alternatives can be modeled. In particular, the purpose of this exercise is to understand the differences (if any) that different factors might cause to choose paid employment as well as unpaid family work.

As for explanatory variables, we have included: (i) age of the individual and its square; (ii) sex dummy (0 if male , 1 if female); (iii) marital status dummy (1 if married, 0 otherwise); (iv) 5 education dummies (no education; primary education, secondary education, SSC/HSC, university education); (v) age of household head; (vi) sex of head (1 if male, 0 if female); (vii) dummies for education of head (primary education, secondary education, SSC/HSC, university education); (viii) dummy for head's occupation (1 if self-employed, 0 if wage employed); (ix) number of members of household; (x) amount of land possessed by the household; (xi) dummy for region (1 if rural, 0 if urban); (xii) number of household members less than 5 years old; (xiii) number of household members more than 65 years old.

Table 5.9: Marginal effect of the determinants of being “Unpaid”

Variables	Marginal effect
Age of the individual	0.006*** (0.001)
Age of the individual (squared)	0.000*** (0.000)
Primary education dummy	0.016*** (0.002)
Secondary education dummy	0.012*** (0.003)
SSC/HSC education dummy	-0.014*** (0.003)
University education dummy	-0.034*** (0.008)
Marital status dummy (1 if married, 0 otherwise)	0.063*** (0.003)
Female dummy (0 if male , 1 if female)	0.077*** (0.001)
Household head age	0.002*** (0.000)
Household head male dummy (1 if male, 0 if female)	0.055*** (0.006)
Household head primary education dummy	0.009*** (0.002)
Household head secondary education dummy	0.011*** (0.003)
Household head SSC/HSC education dummy	0.017*** (0.003)
Household head University education dummy	0.014** (0.006)
Household head self-employed dummy (1 if self-employed, 0 if wage employed)	0.242*** (0.002)
Household size	0.003*** (0.000)
Land holding	0.000*** (0.000)
Rural dummy (1 if rural, 0 if urban)	-0.011*** (0.002)
Number of household members less than 5 years old	0.005*** (0.001)
Number of household members more than 65 years old	0.007*** (0.002)

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Estimates of Table 5.9 show the marginal effects of the explanatory variables on the decision to choose unpaid work based on a multinomial logit model. In particular, it reveals the importance of different factors in affecting the decision to choose unpaid work. Although the estimates are similar to descriptive analysis as shown earlier, in certain cases the estimation results differ with the simple tabular analysis. For example, although the descriptive statistics reflect relatively young male/female as unpaid workers, the econometric analysis reveals that with higher age the probability to participate in unpaid work increases. The effect of education on the participation probability to unpaid work is however not symmetric. According to Table 5.9, having primary as well as secondary education increases the probability to work as unpaid and that has been reflected in the descriptive analysis too. On the other hand, holding other things constant, higher level of education e.g. SSC/HSC or university education reduces the participation probability of unpaid activities. In terms of other socio-demographic variables, our econometric estimation also confirms greater participation intensity of females as opposed to their male counterparts. Individuals belonging to larger households tend more to work as unpaid with having greater number of dependents (members who are below 5 years of age and above 65 years of age). This result can be considered as consistent with our prior expectation because larger households with more dependents are expected to require more labor to support their family farm/business. In terms of the characteristics of household head, the marginal effects generated from multinomial logit regressions show that unpaid workers are more prevalent in households headed by relatively old male heads. Unpaid workers are more commonly found in households headed by self-employed heads, which is consistent with the findings of descriptive analysis. It is however interesting that, unpaid workers are more likely to work in households headed by educated persons.

In Table 5.10, based on the same multinomial logit model, a comparison of the effect of different factors on the choice of labor market outcomes has been shown. Here, “being in unpaid work” is considered as the base group

Table 5.10: Multinomial logit model estimation (base category “unpaid”)

Variables	Not in Labor force	Unemployed	Paid employment
Age of the individual	-0.196*** (0.007)	-0.059*** (0.012)	0.071*** (0.008)
Age of the individual (squared)	0.004*** (0.000)	0.002*** (0.000)	0.001*** (0.000)
Primary education dummy	-0.326*** (0.033)	0.065 (0.079)	-0.085** (0.035)
Secondary education dummy	-0.225*** (0.039)	0.227*** (0.088)	-0.098** (0.041)
SSC/HSC education dummy	0.567*** (0.038)	0.741*** (0.086)	-0.339*** (0.041)
University education dummy	-0.141 (0.126)	1.527*** (0.189)	1.225*** (0.120)
Marital status dummy (1 if married, 0 otherwise)	-1.368*** (0.041)	-1.044*** (0.085)	-0.201*** (0.042)
Female dummy (0 if male, 1 if female)	0.689*** (0.030)	-1.409*** (0.059)	-3.370*** (0.029)
Household head age	-0.018*** (0.001)	-0.020*** (0.002)	-0.029*** (0.001)
Household head male dummy (1 if male, 0 if female)	-0.432*** (0.082)	-0.912*** (0.109)	-1.175*** (0.083)
Household head primary education dummy	-0.007 (0.031)	-0.141** (0.071)	-0.281*** (0.033)
Household head secondary education dummy	-0.016 (0.039)	-0.294*** (0.089)	-0.330*** (0.042)
Household head SSC/HSC education dummy	-0.185*** (0.038)	-0.387*** (0.084)	-0.301*** (0.040)
Household head University education dummy	0.067 (0.081)	-0.528*** (0.155)	-0.516*** (0.091)
Household head self-employed dummy (1 if self-employed, 0 if wage employed)	-3.877*** (0.039)	-4.068*** (0.066)	-2.578*** (0.040)
Household size	0.000 (0.006)	0.058*** (0.013)	-0.104*** (0.007)
Land holding	-0.001*** (0.000)	-0.003*** (0.001)	-0.003*** (0.000)
Rural dummy (1 if rural, 0 if urban)	0.249*** (0.031)	-0.189*** (0.057)	0.027 (0.032)
Number of household members less than 5 years old	-0.064*** (0.017)	-0.080** (0.038)	-0.070*** (0.018)
Number of household members more than 65 years old	-0.202*** (0.029)	-0.055 (0.059)	0.036 (0.030)
Constant	7.317*** (0.151)	3.662*** (0.244)	5.333*** (0.155)

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

and in the multinomial logit model we attempted to understand the impact of different socio-economic variables on different labor market outcomes. Estimation results show that, having university education acts positively to switch from unpaid to paid work and according to Table 5.10, in comparison to those in unpaid work, having a university degree increases the probability to work in paid work by as high as 122 percent. In addition, age also increases the log-odds ratio for paid work vis a vis unpaid work.

As for household composition having a bigger household (with greater number of household members) reduces the probability to work in a paid job than to work in unpaid activities. Similar to earlier results (as in Table 5.9) having a self-employed household head reduces the log odds to work in paid activities. Another interesting differential effect is that of the presence of young children in the household, For example, having children less than 5 years of age reduces the log-odds ratio in case of paid occupation in comparison to the base category of unpaid work. In addition, having more land also found to have negative effect on the log-odds ratio for paid work as opposed to unpaid activities.

In terms of household head's characteristics, the most striking difference can be observed for the broad category of occupation of household head-if the head is self-employed it reduces the log odds ratio of paid work in comparison to unpaid activities, indicating a strong positive influence of self-employment status of household head on the choice of unpaid work. Age and education level of the head also have negative effect on the log-odds ratio in favor of paid activities.

Results of Table 5.10 therefore strengthen the findings of Table 5.9. In particular, factors like age of the household head along with his/her education as well as self-employment status reduces the probability to switch from unpaid to paid work. Individuals belonging to households with more land holding tends to have lower probability to work in paid work than unpaid activities. Having larger household as well as having younger children in the household also reduces the probability to switch from unpaid to paid work, similar conclusion can be drawn for marital status (being married or not). In terms of education of the worker, there appears to exist a threshold and therefore, although below university degree reduces the probability to switch in favor of paid work, having a university degree induces to work for paid work. Based on both the tables we can infer that, both individual as well as household specific characteristics play a determining role in the decision of choosing unpaid work as opposed to paid work.

Estimating Unpaid Family Worker's Contribution

As the name suggests, unlike paid employers e.g. wage employer and self-employer, unpaid family laborers, although included in labor force are not being paid. Such activities include, rearing livestock and poultry, husking paddy, taking care of vegetable garden, helping in small enterprises and shops etc. In the Labor Force Survey of Bangladesh although we have information on the number of unpaid family workers, given that they are not 'paid' it is quite complex to have an estimate of their monetary contribution to the economy.

In this paper with the help of recent labor force survey (2010), we attempted to estimate monetary contribution of unpaid work with the help of a simplified method. In this context we utilized information from the LFS 2010. The data set has information on 15,760 unpaid workers of which 3,677 are male and 12,083 are female. So this data base can be considered as a reasonable basis for estimating monetary valuation of unpaid workers for Bangladesh.

Given that majority (about 94.77 percent) of unpaid worker is headed by self-employed household, we can consider the unpaid worker as the (unpaid) shareholders of the income generated from self-employment activities of the household. So it is reasonable to estimate the contribution of unpaid family worker while distributing that earning of self-employed persons to both the self-employed as well as the unpaid. Here, for the sake of simplicity, the analysis has been isolated only among those households who have at least one self-employed and one unpaid worker.

The earnings generated from the self-employment activities from the last seven days performed in the household can be considered to be the output of the labor input of these individuals (self-employed member and unpaid family worker). In order to distribute the earning, we need to know the labor hours that these individuals have put in. However, in the LFS working hour of neither self-employed nor unpaid has not been reported. The authors in this context took the data of working hours for both the male and female from Time Use Survey (2012) of Bangladesh Bureau of Statistics. So it can be a reasonable way to distribute the income in this proportion of working hour.

In order to distribute the self-employed household income, another important consideration is to incorporate the differences in employment probability of male and female. This can be done while using the probability of being employed for both male and female and to multiply the respective income share of self-employed household member and unpaid member of that household with those probabilities.

- In the first step, total self-employment income (both of self-employed head and/or other self-employed member) of each of the households (only those headed by self-employed) for the last seven days prior to the survey is pooled.
- In the next step, from a simple probit model (see appendix) employment (wage/self) probability of a male as well as a female with respective characteristics has been estimated. Here, according to the probit model, on an average a female has 40 percent probability to get engaged in paid employment where the probability is 94 percent for a male.

- From the Time Use Survey we find that the average working hour for an employed male is reported as 6.9 hours per day and the average working hours for female is 5.2 hours per day.
- As discussed, in the next step, for each households after pooling self-employed income, we need to distribute this income among both the self-employed and unpaid according to the income share where this distribution is based on the probability of wage employment and number of working hours. Therefore, for each male (be it self-employed or unpaid), his pseudo share of earning can be approximated as:

$$\frac{[\text{male's average working hour in a day} \times \text{probability of being employed for that male}]}{[(\text{number of self-employed and unpaid male}) \times (\text{male's average working hour in a day} \times \text{probability of being employed for that male}) + (\text{number of self-employed and unpaid female}) \times (\text{female's average working hour in a day} \times \text{probability of being employed for that female})]}$$

In a similar manner, the pseudo income share for a female can be found as well.

- Finally, the total self-employed income as generated in the next step can be distributed to each of the unpaid as well as self-employed male and female in the proportion as outlined in the previous step.

Based on the steps as discussed, on an average, an unpaid female member's share in household's income is around 23.14 percent. The contribution of unpaid male in the household income is quite small as the proportion of unpaid male in the household is very small.

Conclusion

On the basis of the discussion and analysis outlined in this paper, we can conclude that a number of socio-economic factors, in addition to the conventional factors prevailing in the labor market, contribute toward involvement in unpaid activities and constrain participation in the main stream labor market. As a result, a large number of individuals, particularly women are compelled to work as unpaid family workers within their household where their contribution is not duly recognized either in monetary or in non-monetary terms.

Based on the data of labor force surveys, it was revealed that unpaid work is more prevalent among women where in most cases they work without remuneration in the enterprise/farm of their spouses or father/mother-in-law. As for males, it is more common to work in their parent's farm/business enterprise. It is interesting to find that a significant percentage of unpaid workers have some degree of education and most of the unpaid workers are young and belong to the age group of 15 to 30 years. In addition, occupation of the household head, according to our analysis, plays important role in choosing unpaid work and unpaid workers are found in an overwhelmingly large number in households headed by self-employed head.

Our econometric estimation indicated the importance of a number of socio-economic factors in the decision to choose unpaid work as opposed to paid activities. For example, occupation of household head (head being self-employed) along with greater land holding have strong positive effect on the decision to work as unpaid worker where the opposite holds true for paid work. Having university education although reduces the probability to work as unpaid, primary or secondary education tends to have positive effect on household's decision to work as unpaid. Unpaid work is more prevalent among those who are married and relatively older.

Based on a simple methodology of distributing the self-employed earning of a household among unpaid workers (along with self-employed workers) our analysis revealed that although the contribution/share of unpaid work performed by men is not that substantial, that of women has been found to be as high as 23 percent of total household self-employed income. Therefore, these works constitute a substantial part of the time of the workers and contribute significantly towards national income of the country. Despite of such a monetary contribution to the economy, unpaid workers are unable to enjoy the benefits of paid work and are left outside of the realm of formal labor market. The key challenge in the context of unpaid family work is therefore to get it remunerated

and/or helping them to enter the formal labor market. Based on the analysis as discussed in this paper, a number of recommendations can be proposed:

General recommendations

- One of the most important requirements for understanding the monetary value of unpaid work is to have sufficient information of undocumented activities. Documentation requires comprehensive data base on related variables and in this context, it is important that the Bureau of Statistics (BBS) provides clear definition and categorization of unpaid activities in a regular manner. Consistency of newer data with older surveys is important as well.
- In order to reduce the burden of unpaid work, especially those with alternative forms of mechanization, the government should emphasize on developing the infrastructure, encourage agro-business activities, provide credit at low interest for purchasing agricultural equipment etc.
- In order to bring the unpaid workers to self-employment activities and to encourage them to increasingly enter the agriculture sector through main stream labor market, there should be increasing initiatives from the government as well as the NGOs including those of establishing information cell in Thanas, providing credit at low interest rate with flexibility in terms of collateral etc.

Recommendations for women unpaid workers

- There should be bigger initiative from the government for expanding the skill development programs especially for small and medium enterprise development for women. These programs can encourage more women to enter paid employment.
- To encourage women to switch towards formal wage/self-employment, steps should be taken to ease her domestic burden and in this context, it is crucial to manage child care facilities for women working outside their house.
- In the context of Bangladesh, due to complex inheritance law, women's right on land is often not clearly defined and that acts as a crucial constraint preventing their active participation in paid agricultural activities and in accessing credit in particular. There should be specific and flexible policies from the government in this regard to ease the credit constraint for women.
- Another crucial yet neglected constraint for women's participation in the formal wage employment is expensive and unsafe transportation and costly accommodation. In this regard, the government should work in collaboration with the private sector for ensuring cheap and safe accommodation and transportation.
- A much bigger yet general problem is that of child marriage. Being married at a younger age often forces young girls to stay at home and to work at the farm/business of in-laws. The government should deal with such deep rooted problems in order to enable greater participation of women in main stream activities.

Dynamics of Employment in the Urban Informal Sector in Bangladesh

Selim Raihan, K. M. Nafiz Iteakhar and Mir Tanzim Nur Angkur

Introduction

The informal economy refers to activities and income that are partially or fully outside government regulation, taxation, and observation. The main attraction of the undeclared economy is financial. This type of activity allows employers, paid employees, and the self-employed to increase their take-home earnings or reduce their costs by evading taxation and social contributions. On one hand, informal employment can provide a cushion for workers who cannot find a job in the formal sector. But, on the other hand, it entails a loss in budget revenues by reducing taxes and social security contributions paid, and therefore the availability of funds to improve infrastructure and other public goods and services. It invariably leads to a high tax burden on registered labor.

Like many developing countries, the urban formal sector in Bangladesh is not able to provide enough job opportunities for its growing labor force. The growing labor forces can easily find themselves in the urban informal sector for their livelihoods. Therefore, urban formal sector has gained much attention to the policymakers for its important significance in the economy. In this context, it is very important to understand the dynamics and different issues of this urban informal sector so that better policies can be designed to address the requirements of the workers engaged in these sectors. Against this background, this study provides a detailed overview of the urban informal sector in Bangladesh and explores the factors that affect the decision of the individuals to enter into the urban informal sector.

Literature Review

The concept of informal sector gained much attention over the last few decades. This is especially true in the contexts of most developing countries where the informal sector has been a major factor behind employment creation, production and income generation. Hart (1973) was the first to put forward the concept of 'informal sector' into the academic literature as part of the urban labor force, which takes place outside of the formal sector.

A number of empirical studies exist on the determinants of labor force participation in the urban informal sector mainly in the context of developing countries. Most of these empirical studies found individual, household, social and economic characteristics such as age, year of schooling (educational attainment), marital status, number and age of children, size of the households, household headship, region of residence, religion, wage and gender to be the major factors that may affect an individual's participation to the urban informal sector.

In the context of Kenya, Wamuthenya (2010) found that sex, marital status, age, level of education and household-headship were significant factors in case of labor force participation in the urban informal sector. In the Sri Lankan context, Jayawardena and Arunatilake (2010) found that being male increased the likelihood of participation in the informal sector and being old decreased the chance of being in the informal sector compared to that of the public sector. Furthermore, individuals with the very low level of education and with no training had more chance of being employed in the informal sector as opposed to the public sector.

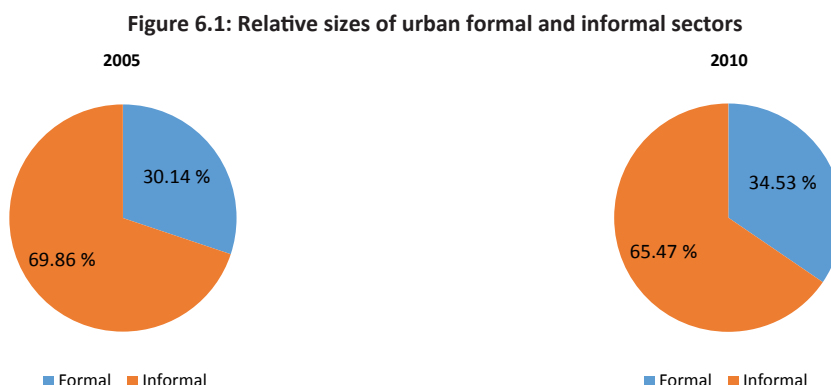
Marcouiller *et al.* (1997) and Saavedra and Chong (1999), in the context of Peru, found that young people, individuals who were not household heads and females were more likely to participate in the informal sector. Funkhouser (1999) observed similar results for several Central American countries. Reddy *et al.* (2001), in the context of Fiji, showed that those who participated in the urban informal sector, had on average education less than the primary level. Timalsina (2011), in the context of Nepal, found that people with low level of education and skills were engaged in urban informal activities.

Overview of the Urban Informal Employment in Bangladesh

The study has used the Labor Force Survey (LFS) of two years (2005 and 2010) of Bangladesh to analyze the dynamics of urban informal employment in Bangladesh. Defining informal work was the challenge for this study. Different studies have defined informality based on certain characteristics ranging from ease of entry, low resource-base, family ownership, small-scale, labor-intensive, adapted technology, unregulated but competitive markets, and informal processes of acquiring skills. The LFS provides a limited amount of information which can be used to define informality.

We have defined informality in this paper by using three dimensions. The first dimension relates to the production unit or enterprise in which the workers work. More specifically, if the production units or enterprises are not registered with the concerned authority then we consider those units fall under the informal sector. The second dimension relates to the existence of contract between the workers and the employers. If there is no contract between workers and employers either in written or verbal form, then we classify those workers as belonging to the informal sector. In addition to the above two criterion, for the wage employed workers, if the workers do not get any kind of pay slips or any kind of documents for their wages, then they are considered to be involved in the informal sector. In other developing countries such as Brazil, Mexico and India they consider two indicators – jobs with no social security coverage or written records as means of defining informal wage employment (Husmanns, 2004).

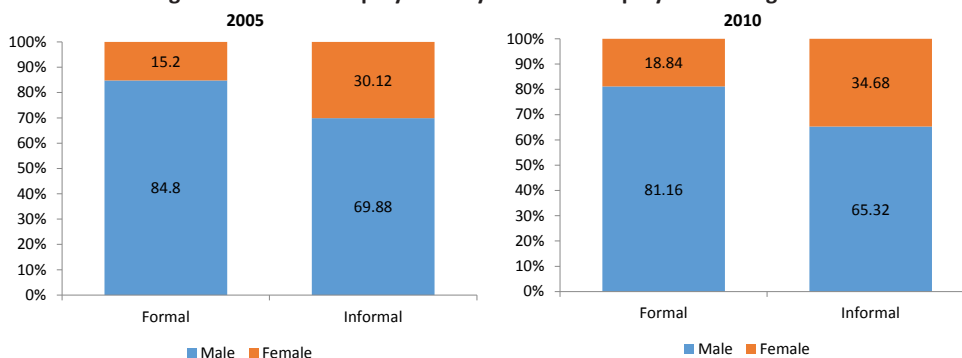
Based on the above mentioned definitions, employment in the urban area in Bangladesh is divided into formal and informal employments. Figure 6.1 states that in both 2005 and 2010, informal employment accounted for around two-thirds of the total urban employment. However, during 2005 and 2010, there has been a reduction in that share of informal employment from 70 percent in 2005 to 65 percent in 2010.



Source: LFS, 2005 and 2010

In terms of employment by nature of employment and gender, the share of female workers in both urban formal and informal sectors increased in 2010 compared to those in 2005. However, for the male workers, the share fell for both formal and informal sectors in 2010 as compared to those in 2005 (Figure 6.2).

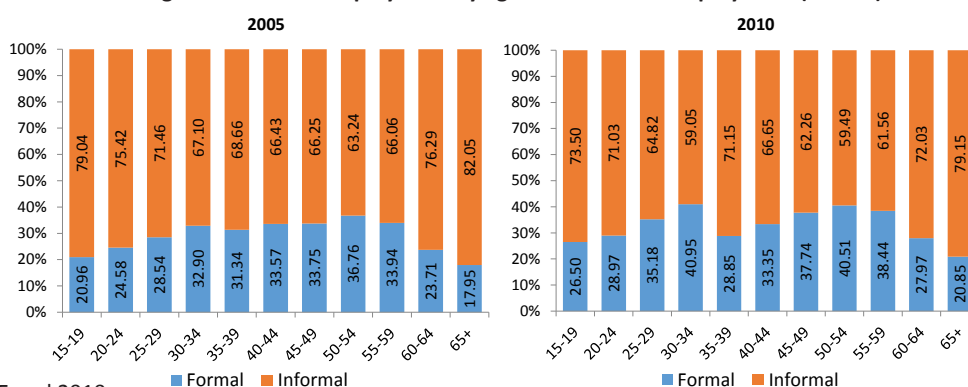
Figure 6.2: Urban employment by nature of employment and gender



Source: LFS, 2005 and 2010

Figure 6.3 shows that in terms of age group of workers, the shares of younger age groups in informal sectors decreased in 2010 compared to those in 2005, particularly those belonging to the age groups of 15-19, 20-24, 25-29 and 30-34. Similarly the shares of older age groups belonging to 50-54, 55-59, 60-64 and 65+ in informal sector declined in 2010. However, the shares for the middle aged workers belonging to 35-39, 40-44, 45-49 age groups, increased in 2010 compared to those in 2005.

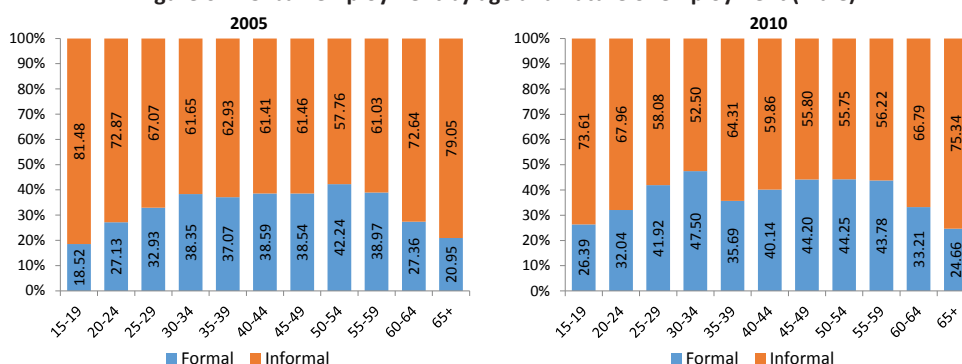
Figure 6.3: Urban employment by age and nature of employment (overall)



Source: LFS, 2005 and 2010

Figure 6.4 shows that in the case of only male workers, the younger age groups belonging to 15-19, 20-24, 25-29 and 30-34 age groups participated more in urban formal sector in 2010 as compared to those in 2005. In 2010, the shares of middle aged group belonging to 40-44, 45-49 in informal sector also decreased. For the older groups belonging to 60-64 and 65+, the shares in urban informal sector fell in 2010 as opposed to 2005.

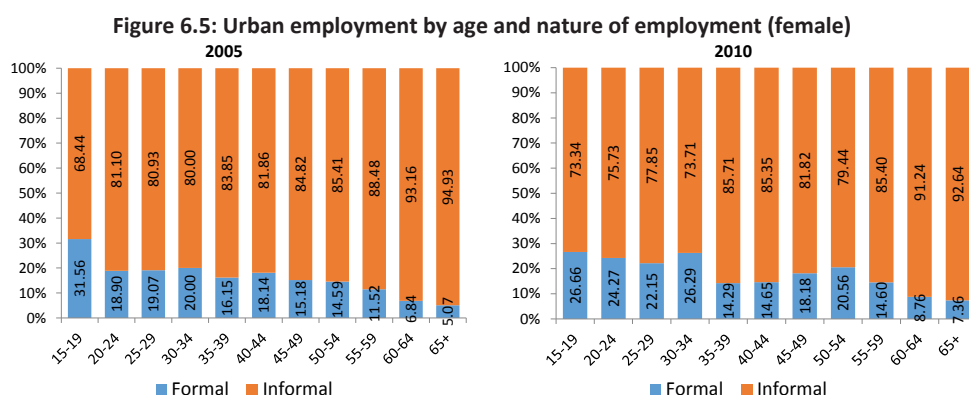
Figure 6.4: Urban employment by age and nature of employment (male)



Source: LFS, 2005 and 2010

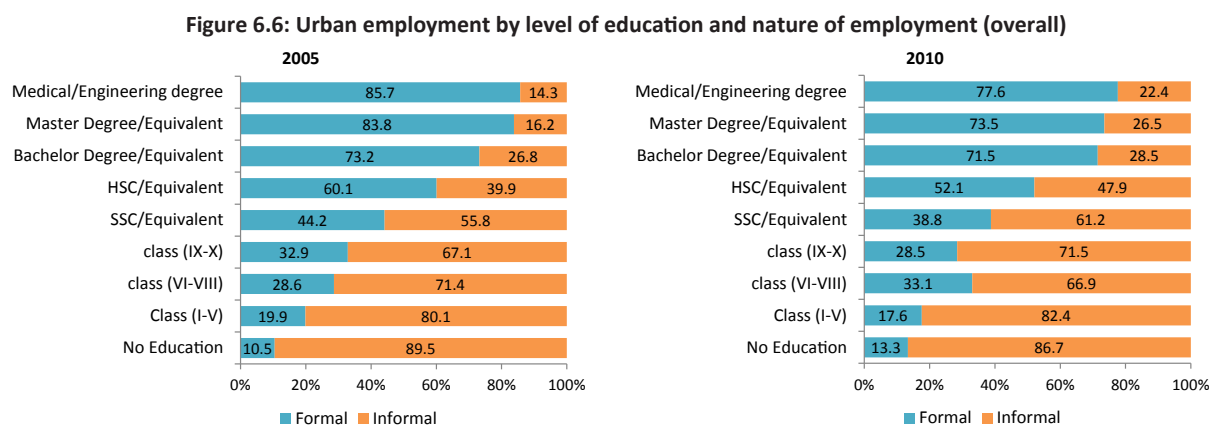
Considering only female workers, Figure 6.5 suggests that the involvement of the younger workers belonging to the age groups 20-24, 25-29, 30-34 in urban informal sector decreased in 2010 compared to those in 2005 except for the age group belonging to 15-19. For the middle aged groups, 35-39 and 40-44, their shares in urban informal sector increased in 2010 as opposed to 2005. But for the relatively older age groups belonging to 45-49, 50-54, 55-59, 60-64 and 65+, the involvement in urban informal sector fell in 2010.

From the above analysis it can be inferred that in both 2005 and 2010, middle aged male workers were more likely to be involved in the formal sector employment compared to younger and older aged workers. This may be due to the fact that middle aged workers tend to be more skillful compared to younger workers and this is justified on the ground that there is a positive relationship between years of education and formal sector participation. Due to the age constraint older workers may not have that much efficiency to work in the formal sector and in the process they get employed in the informal sector. For female workers the formal sector participation is less in both 2005 and 2010 compared to their male counterparts. This also may occur because of the fact that female education is still very low compared to their male counterpart.



Source: LFS, 2005 and 2010

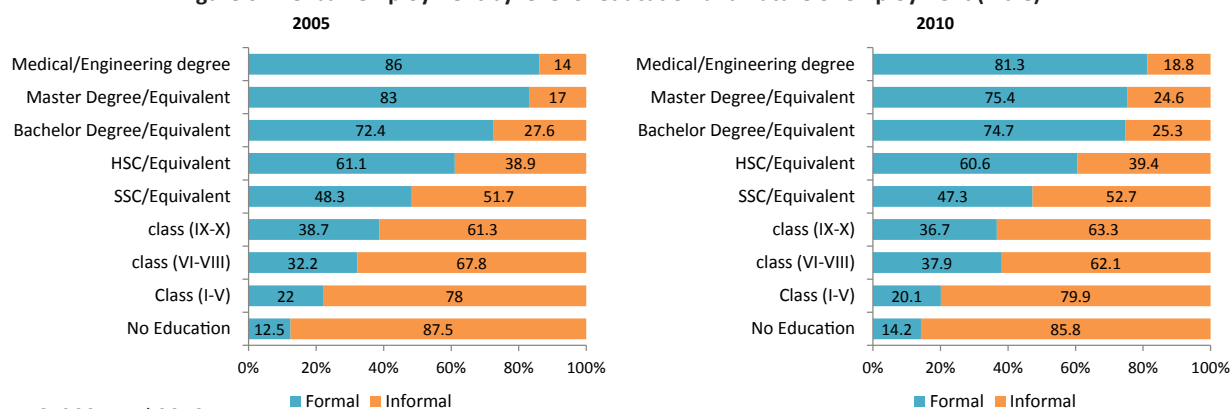
Figure 6.6 shows the employment by level of education and nature of employment for workers. It is of no surprise to see that majority of the workers with the lower level of education found themselves involved in the urban informal sector in both 2005 and 2010. It can be seen that the share of formal sector is higher than that of the informal sector for workers attaining higher secondary education and above in both 2005 and 2010. This implies, workers who passed higher secondary education or higher level of education found themselves more in formal sector relative to informal sector in both the years.



Source: LFS, 2005 and 2010

From Figure 6.7, it is seen that male workers with lower level of education, particularly below HSC education, were more employed in the informal sector in both the years. The figure also suggests that once a male worker passed HSC or higher level of education, he is more likely to get employed in formal sector rather than in the informal sector.

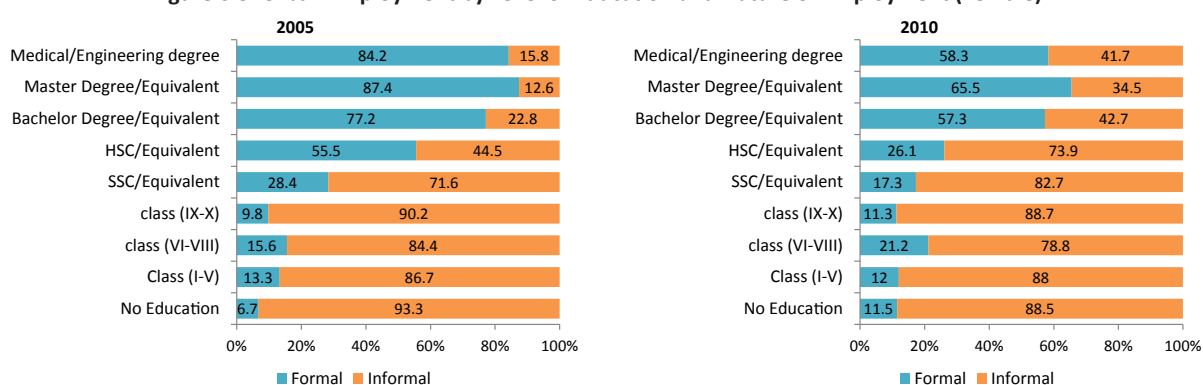
Figure 6.7: Urban employment by level of education and nature of employment (male)



Source: LFS, 2005 and 2010

Considering only the female workers, Figure 6.8 shows almost the same pattern of employment by level of education and nature of employment for both years as we have seen for male and for the overall situation. However, there lies a difference in the sense that, in 2005 female workers were more involved in formal sector compared to informal sector with HSC and above level of education, but this has changed in 2010, where female workers were more involved in formal sector compared to the informal sector after they have passed bachelor degree. In general it could be seen that the share of formal employment at very high level of education had been reduced. Lack of opportunities in the urban formal sector and rise in informal sector wage might be responsible for this.

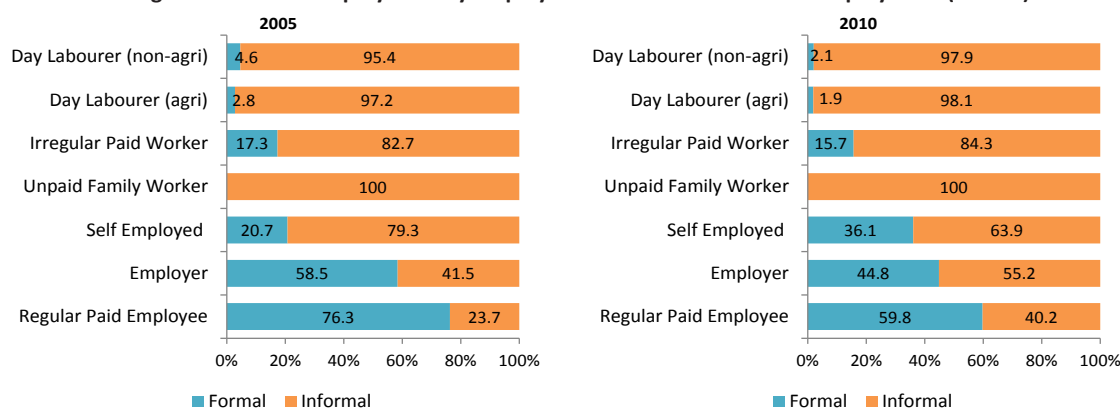
Figure 6.8: Urban Employment by Level of Education and Nature of Employment (Female)



Source: LFS, 2005 and 2010

Figure 6.9 shows the urban employment by status and nature of employment. It can be seen that for unpaid workers the nature of employment is fully informal. And for the category of regular paid employee the share of formal employment is higher in both years, though the share declined in 2010. For the rest of other categories the share of informal employment is higher except employer category. For employers, the share of formal employment was higher in 2005 but this changed in 2010 where the share of informal employment became higher. Also it can be seen that during 2005 and 2010, the share of formal employment increased for self-employed labor only.

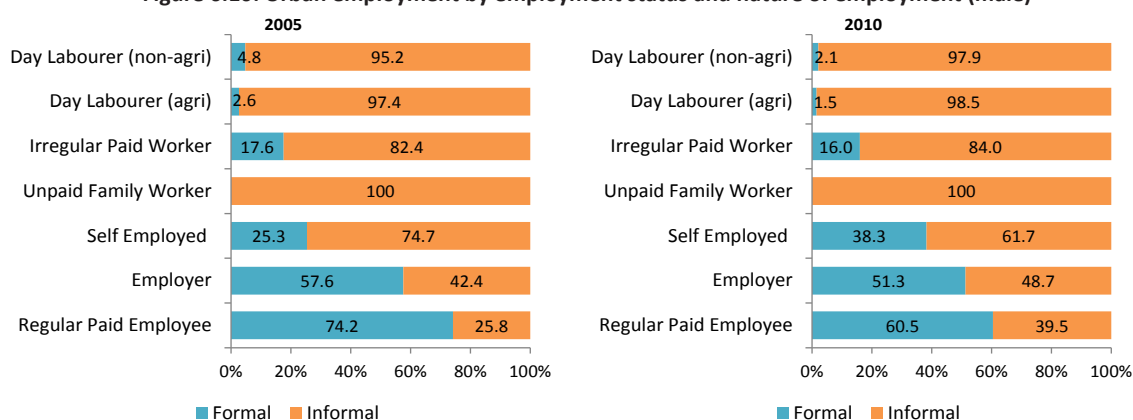
Figure 6.9: Urban employment by employment status and nature of employment (overall)



Source: LFS, 2005 and 2010

Figure 6.10 represents the status and nature of employment considering only male workers. The 'employer' category in both 2005 and 2010, were almost equally involved in formal and informal sector. But for the remaining categories informal employment shares were higher except for the regular paid employee. In particular, for self-employed labor the share of formal employment increased during the period.

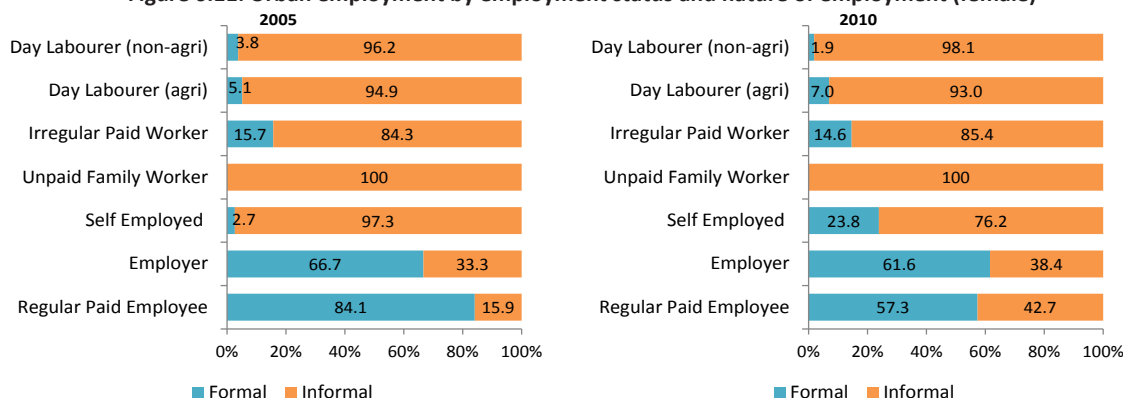
Figure 6.10: Urban employment by employment status and nature of employment (male)



Source: LFS, 2005 and 2010

Considering only the female workers, Figure 6.11 shows almost the same pattern of employment by employment status and nature of employment for both years as we have seen for male and for the overall situation. For all categories informal employment shares were higher except for the employer and regular paid employee in both 2005 and 2010. In particular, for self-employed female labor, the share of formal employment increased remarkably during the period.

Figure 6.11: Urban employment by employment status and nature of employment (female)



Source: LFS, 2005 and 2010

The aforementioned overview section provides a bivariate association between the individual determinants of informal sector participation. The possible determinants include status of employment, age of workers, level of education and gender. To imply causality further econometric estimation of urban informal sector participation is required which is covered in the following section.

What Determines Participation in the Urban Informal Employment?

This study aims to find out the factors affecting the decision of participating in urban informal sector. There may be several unobservable individual factors which may affect the informal sector participation of the labor belonging to urban areas. This unobserved heterogeneity (i.e., individual ability) might result in the inconsistency of the estimated parameters which is known as heterogeneity bias. To remove this biasness fixed effect estimator was used. To apply fixed effect estimator we needed to have a panel data which is currently unavailable. For the purpose of the estimation we developed a pseudo panel by constructing the cohorts (cohorts are the sub groups of the sample) using the 'industry types'. In our case the labor from a particular industry type was taken as a cohort of that industry type. That means for each industry type we will have a cohort. Though there are several industry types in the Labor Force Survey of 2010 and 2005, we have reclassified (i.e. merge comparable industry types into one, recode where necessary) the industry types to make that data of 2005 comparable with the data of 2010. This study has used the following regression model:

$$\text{informal}_{it} = \beta_0 + \beta_1 \text{edu}_{it} + \beta_2 \text{deprto}_{it} + \beta_3 \text{age}_{it} + \beta_4 \text{age_sqr}_{it} + \beta_5 \text{land}_{it} + \beta_6 \text{female}_{it} + \beta_7 \text{unpaid}_{it} + \beta_8 \text{self}_{it} + \mu_{it}$$

In the above regression model the dependent variable is the informal intensity of any sector, i.e. the percentage of informal participation in a particular industry type out of total employed persons in that industry type. This variable can thus be termed as the informal sector participation. The variables that affect the decision of participation in the informal sector can include both individual and family characteristics. To capture the effect of individual and family characteristics, years of schooling (edu), individual age, dependency ratio (deprto), measured as the ratio of number of dependents in the family to total members of the family, and gender (female dummy) are introduced as explanatory variables. The square term of age (age_sqr) is also included in the regression to capture the non-linearity in the effect of age on the informal sector participation. The financial condition of the workers' household may also affect the decision to enter in the informal sector. The land holding (land), measured in acres, was used as a proxy of the financial condition of the household. Furthermore, an employed person may be a wage employed (wage), self-employed (self) or may be an unpaid worker (unpaid) as per the LFS (Labor Force Survey) classification. We, therefore, have introduced dummies representing these three groups in the regression to see whether there is any association between informal sector participation and employment types after controlling for other factors. The category of wage employed (wage) is omitted from the regression as we are taking this group as the base category.

By taking the average for each cohort we are able to construct a pseudo panel where each of the observation represents a particular industry type. The interpretations of the independent variables in the context of the pseudo panel are the following:

- The variable representing education level of the workers is interpreted as average years of schooling of the labor employed in a particular industry type.
- Family dependency is described as the average family dependency ratio of the labor employed in a particular industry type.
- Family landholding is the average landholding of the family of the labor employed in a particular industry type.
- The variable female represents the percentage of female workers out of total workers employed in a particular industry type.
- The variable age is the average age of the labor employed in a particular industry type.

- The effect of employment characteristics, for example, the variable representing self-employed labor (self), is interpreted as the percentage of self-employed labor in a particular industry type out of total employed person in that industry type. Other two independent variables of employment characteristics are interpreted in the same way.

We have applied fixed effect estimator in the pseudo panel, which is basically applying OLS on time demean data and in this process the unobserved heterogeneity (the industry fixed effect) is removed. We have also applied the random effect estimator which is basically applying the OLS on quasi demeaned data. Random effect estimator is used when it is assumed that the unobserved heterogeneity is not correlated with any of the explanatory variables appeared in the regression model.

Regression results considering all employment types

Table 6.1 presents the regression results considering all employment types. In general, the fixed effect and random effect results are similar. From the fixed effect estimation we have found that one year increase in average years of schooling of labor employed in a particular industry code would decrease the informal intensity (the percentage of labor employed in informal type of firm out of total number of labor in the respective industry code) of that industry code on an average by 0.048 percentage points. The estimated coefficients of dependency ratio imply that an increase in average dependency ratio of the families of an industry classification leads to an increase in the informal intensity of that industry classification. The coefficient of age is negative and significant while the coefficient of age squared is positive and significant, which imply a quadratic relationship between age and informal sector participation. More specifically, initially an increase in age reduces the informal sector participation, while after a certain level of age the effect of age on the informal sector participation becomes positive. The estimated coefficient of female is not significant, which suggests that gender doesn't have any effect on informal intensity of an industry type. The estimated coefficients of the unpaid labor suggest that this worker group is likely to be more associated with informal sector than that of the wage employed labor, which is the base category. The estimated coefficients of the other worker group i.e. self-employed is also found to be positive and significant under both fixed effect and random effect estimator. This implies that self-employed worker are more likely to be associated with urban informal sector compared to the wage employed labor.

Table 6.1: Pseudo panel regression on sectoral informal intensity (all employment types)

Explanatory variables	Informal intensity (Fixed effect)	Informal intensity (Random effect)
Education	-0.048*** (0.013)	-0.041*** (0.005)
Dependency ratio	0.140** (0.058)	0.085** (0.039)
Landholding	-0.0005 (0.001)	-0.001 (0.001)
Age	-0.058*** (0.022)	-0.049*** (0.019)
Age squared	0.001*** (0.0003)	0.001** (0.0002)
Female	0.034 (0.127)	-0.01 (0.09)
Unpaid labor	0.567*** (0.219)	0.555*** (0.136)
Self-employment	0.27** (0.12)	0.30*** (0.07)
Constant	1.51*** (0.41)	1.49*** (0.34)
Number of observations	235	235
F	8.475***	
chi2		510.23***
R2	0.539	0.569

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Regression results excluding unpaid labor

Table 6.2 presents the results of informal intensity regression for the model which exclude the unpaid labor from the pseudo panel data set. Similar results are observed for the variables like education, dependency ratio, age, female dummy etc. as have been found for the overall model. Like the earlier case, wage employed is considered as the base category. The estimated coefficient of the self-employed labor, under both fixed effect and random effect models, is found to be positive and significant, which suggests that compared to the wage employed labor category, self-employed labor is more likely to be involved in the urban informal sector.

Table 6.2: Pseudo panel regression on sectoral informal intensity (unpaid labor dropped)

Explanatory variables	Informal intensity (Fixed effect)	Informal intensity (Random effects)
Education	-0.048*** (0.012)	-0.043*** (0.005)
Dependency ratio	0.181*** (0.057)	0.105*** (0.041)
Landholding	-0.0012 (0.001)	-0.0015 (0.001)
Age	-0.06*** (0.023)	-0.044** (0.019)
Age squared	0.001*** (0.0003)	0.001** (0.0002)
Female	-0.005 (0.118)	-0.01 (0.095)
Self-employed	0.302*** (0.114)	0.327*** (0.063)
Constant	1.51*** (0.412)	1.40*** (0.35)
Number of observations	235	235
F	8.022***	
chi2		485.90***
R2	0.511	0.543

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Conclusion

This paper has provided a detailed overview of the urban informal sector in Bangladesh and has explored the factors that affect the decision of the individuals to enter into the urban informal sector. The paper has used sophisticated econometric models in exploring such determinants. The regression results suggest that education plays a key role in promoting formal sector participation. Also, certain household and individual characteristics, such as dependency ratio and age of the workers also have important implications for informal sector participation. Workers belonging to younger and older age groups are more inclined to participate in urban informal sector than the workers belonging to the middle age groups. Also, workers coming from a family with high dependency ratio have to resort to urban informal sector activities for their livelihood. It is also found that employment types affect the decision to enter in the urban informal sector. While, unpaid workers are fully associated with the informal sector employment, compared to the self-employed labor, wage employed labor are less likely to be associated with the informal sector.

Some Estimates of First Demographic Dividend in Bangladesh: An Application of the Bangladesh National Transfer Account

Bazlul H Khondker and Muhammad Moshir Rahman

Introduction

Bangladesh has entered the window of population dividend opportunities from 1991 onward as the dependency ratio decreased. However, the expressed time of the window of opportunities is not bolstered by observational confirmation. The absence of certain proof on the period and extent of the demographic dividend is a gap policy makers must address when setting needs for human resource and capital investment to gather the economic advantages of the demographic move. Applying the methodology of National Transfer Account (NTA), this study is an endeavor to fill this gap by indicating so as to evaluate the demographic benefit for Bangladesh. Therefore, the objective of the paper is to evaluate the first demographic dividend in Bangladesh and to explore the conditions to appreciate it.

Literature Review

There is a large pool of literatures on demographic patterns and their effects on the economy; however, the evidence on the connection between economic growth and the working age population is limited. Bloom *et al.* (2000) and Mason (2001) suggested that the East Asia's high economic performance was largely associated with the noteworthy move in the age structure of the region; and they found a positive association between high economic performance and the proportion of the working-age population - capturing the transition in the age structure. Applying cross-country panel data from 1965 to 1995, Bloom and Canning (2004) demonstrated a positive and important relationship between the economic growth and growth of the share of the working-age population. Mason (2006) proposed that, every nation in the Asia and Pacific region needed to act to gather the first demographic dividend. Similarly, other papers (i.e. Fry and Mason, 1982, Higgins, 1998; Kelley and Schmidt, 1996; Person, 2002; Rajan and Subramanian, 2008) also found positive association between national aggregate rates for major economic variables and demographic structure.

Overview of Demographic Transition and Employment Structure in Bangladesh

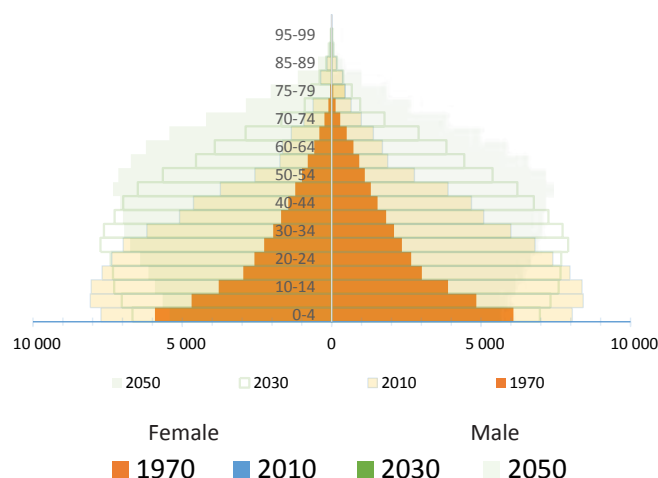
Demographic transition in Bangladesh

Demographic transition captures the movement of a society from an equilibrium, portrayed by high fertility and high mortality, to another one depicted by low fertility and low mortality. In the initial phases of the transition, mortality falls first and especially among the children (Bloom *et al.*, 2000). Improved survival among the young cohorts creates a boom in generation and a surge in fertility decisions. Thus, child dependency rate rises and population growth adjusts downwards to account for lower mortality, the mean age of the population begins to increase. As the large cohorts enter the working age, the working age population expands relative to the total population and the child dependency ratios decline. The last stage of this transition is characterized by a surge in the size of the elderly population as large cohorts reach retirement age, compelling up the old-age dependency ratio.

According to the Census 2011, Bangladesh's population stood at 149.8 million implying an increase of 25.4 million between 2001 and 2011. By 2030 the projected total population of Bangladesh will be 185.1 million due to two

factors (i) an increase in life expectancy at birth for male and female respectively from 67.8 and 69.1 years in 2005-2010 to 74.4 and 76.6 in 2025-2030, and (ii) a decline in the total fertility rate (TFR) from 2.40 to 1.83.

Figure 7.1: Demographic and age structure transition in Bangladesh

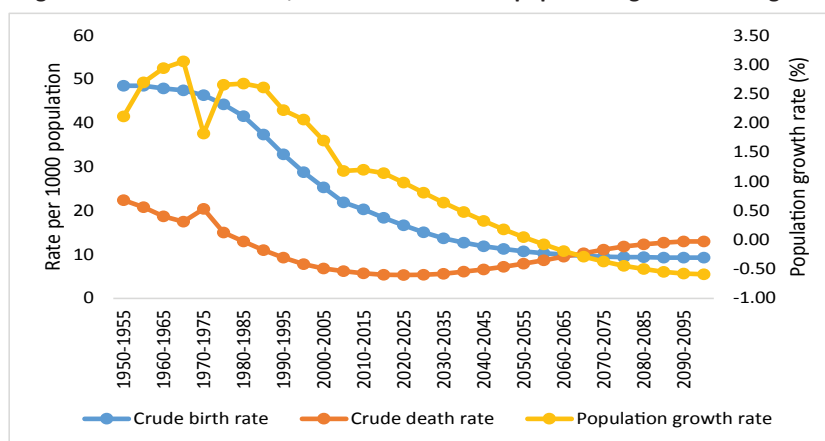


Note: Population in thousand

Source: Constructed from United Nations World Population Prospects: The 2015 Revision (United Nations 2015)

Figure 7.1 shows the demographic and age structure transition in Bangladesh. According to the World Population Prospectus (2015), the implication of the demographic transition on age structure are evident for the population under 15 years of age as the share in the total population of this age group fell from 44.7 percent in 1970 to 31.7 percent in 2010; and is projected to decline to 17.3 percent in 2050. At the same time, the population under the age of 20 years fell from 54.7 percent in 1970 to 42.2 percent in 2010 and is projected to decline to 23.5 percent in 2050. The large decline in the share of the population under 20 years of age has been associated with a substantial rise in the proportion of the working age population (15-64 years) from 41.9 percent to 53.2 percent in 2010 and is projected to be a maximum of 60.3 percent in 2050.

Figure 7.2: Crude birth rate, crude death rate and population growth in Bangladesh



Source: Constructed from United Nations World Population Prospects: The 2015 Revision (United Nations 2015)

According to Figure 7.2, the annual exponential population growth rate was above 2 percent between the late 1970s and the mid 1990s. This period was associated with a birth rate of above 35 per 1,000 population and gradual decline in the death rate. On the other hand, the annual exponential population growth rate was below 2 percent from late 1990s to the recent years when both the death and birth rates have been gradually declining. Although, population growth rates suggest somewhat smooth declining pattern, sudden large drop in the growth between 1970 and 1975 deserves some elaboration. Curlin et al (1976), related this drop to marked fluctuation in the crude death rate and the liberation war in 1971. In particular, the death rate, during that period, climbed sharply to 210 per 1,000, 37 percent higher than the five – year average. By 1972-73, a significant recovery was

noted (i.e. 162 death per 1,000), although the rate remained above normal levels. Full recovery to the trend was observed in 1973-74, three years after the liberation war. However during 1974-75 period – a period associated with exorbitant increase in price of food grains– mortality rate increased and fertility rate declined (see Chowdhury and Curlin, 1978 for details). Both crude death rates and infant mortality (primarily post-neonatal mortality) increased sharply in 1974 and remained high in 1975.

The upshot of the above discussion points to the fact that the age structure of Bangladesh's population is likely to undergo remarkable transitions in near future leading to a decline in the relative share of children and an increase in the share of the elderly and working-age populations.

Economic structure, employment and labor force participation

In the 1960s, the then East Pakistan's economy grew by an annual average rate of around 4 percent. About a fifth of that economy was destroyed during the 1971 Liberation War, and severe dislocations caused at that time left Bangladesh on a slower economic growth trajectory for the following two decades. Then the economic growth accelerated from 1990 to a growth rate over 4 percent in the first half of 1990s. During the latter half of 1990s, the growth rate exceeded over 5 percent. In the last decade it has been hovering around average 6 percent growth rate.

The sectoral economic growth as well as the structure of the economy has changed significantly over the past two decades. The growth rate of agricultural sector has varied over the last two decades with low to moderate magnitude. The manufacturing sector experienced significant growth. Growth rate of the services sector has been stable at around 5-6 percent over the last two decades. The share of agriculture in GDP declined from over 50 percent in 1972 to 16 percent in 2014, with a decline in employment share from about 75 percent to 45 percent. Since 1980, the share of manufacturing has been on the rise approaching 20 percent of GDP in 2014. However, Services, mostly informal, continued to make up the bulk of economic activity, holding at about 50 percent in 2014 compared to about 45 percent in 1972.

Structural transformation has also affected the employment structure, albeit to a lesser extent. Table 7.1 presents share of employed persons aged 15 years and above by broad economic sectors during four consecutive year categories: 1990-00, 2002-03, 2005-06 and 2010. Share of employment in agriculture was 51.1 percent in 1999-00. It slightly increased to 52.2 percent in 2002-03 and kept on decreasing after that. Despite the declining trend, it still accounts for 47.5 percent of the total employment in 2010.

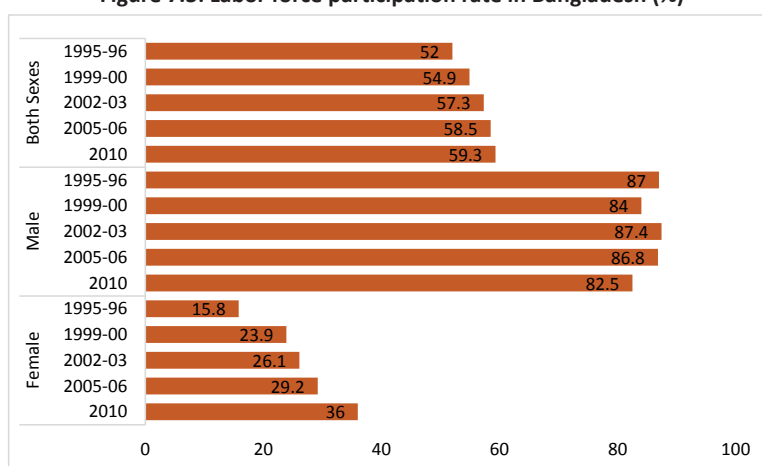
Table 7.1: Employed persons aged 15 years and over by broad economic sector (%)

Broad Sector	1999-00	2002-03	2005-06	2010
Agriculture	51.06	52.15	48.21	47.51
Non-agriculture	48.94	47.85	51.79	52.49
Manufacturing	9.53	9.75	10.95	12.34
Other industry	3.09	3.63	3.37	4.97
Services	36.32	34.47	37.47	35.17

Source: Labor Force Survey, BBS

A major feature of the labor force participation in Bangladesh is the low level of female labor participation. Figure 7.3 shows considerable variations with respect to male and female labor force participation. It is found that labor force participation increased from 52 percent in 1996 to 59.3 percent in 2010. A structural shift in male and female labor force participation has been observed during this period. More specifically, male labor force participation decreased from 87 percent in 1996 to 82.5 percent in 2010 while female labor force participation experienced almost 100 percent increase; from 15.8 percent in 1996 to 36 percent in 2010.

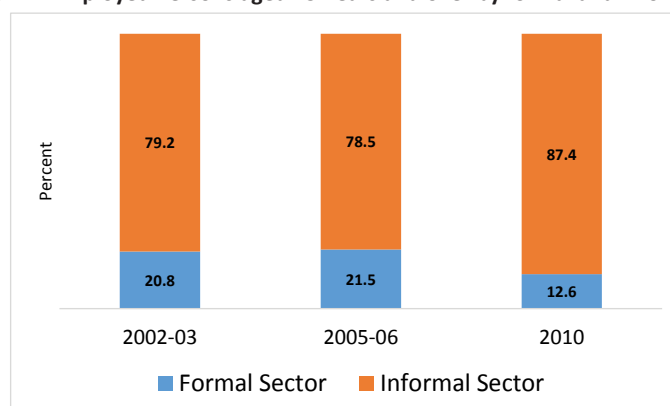
Figure 7.3: Labor force participation rate in Bangladesh (%)



Source: Labor Force Survey, BBS

Employment by formal and informal sources is shown in Figure 7.4. The share of informal employment has historically been high in Bangladesh. More than 75 percent of the workers were employed in the informal sector between 2002-03 and 2005-06. The share of informal employment increased to around 87 percent in 2010 from 79 percent reported for 2005-06.

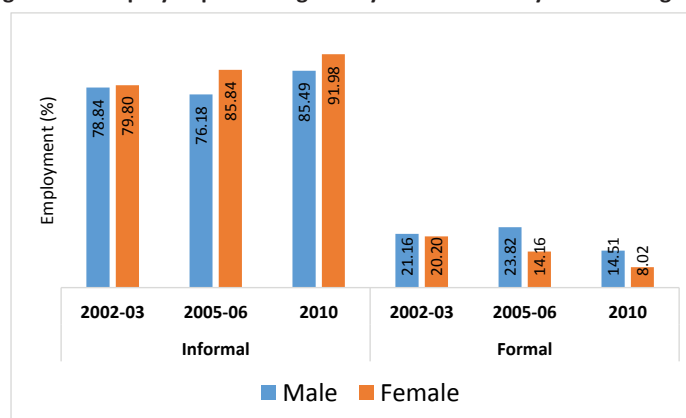
Figure 7.4: Employed Persons aged 15 Years and over by formal and informal sector



Source: Labor Force Survey, BBS

Figure 7.5 shows employment by formal and informal sector and by gender for selected years. In year 2002-03, shares of employment for male and female were similar in both informal and formal sector. More specifically, 78.8 percent of male employment was in the informal sector while the corresponding figure for female employment was slightly higher at 79.8 percent. Thereafter, the share of female employment in the informal sector increased - by about 6 percentage points between 2002-03 and 2005-06; and by about 12 percentage points between 2002-03 and 2010. The share of female employment in formal sector thus decreased.

Figure 7.5: Employed persons aged 15 years and over by sector and gender



Source: Labor Force Survey, BBS

National Transfer Accounts Analysis for estimating the First Demographic Dividend in Bangladesh

National Transfer Accounts provide an accounting of economic flows to and from residents of a country classified by their age. The accounts are comprehensive in that all economic flows that arise as a consequence of the production of goods and services during the year are incorporated into the accounts. The aggregate values are broadly consistent with those found in national accounts, as detailed in the System of National Accounts (SNA) methodology maintained by the United Nations. National Transfer Accounts are structured to emphasize the generational economy and its key features: the economic life cycle and age reallocations realized by relying on intergenerational transfers and assets. NTA is an analytical framework for accounting for the life-cycle deficit. The life cycle deficit equals consumption less labor income with the introduction of age into the national accounts. The consumption in an economy from an individual perspective includes publicly (government) sponsored targeted programs for health care, education, poverty alleviation, social assistance and other goods either in kind or in cash and private (household) consumption for, among other things, education, healthcare, housing, food and non-food goods.

The demographic transition can enhance economic growth in *two broad ways*. First, as the dependency ratios declines and the share of working age population grows relative to the total population, the average number of children per working age adult also falls. Assuming, this is associated with a freeing up of resources that previously would have been consumed by additional children - allowing living standards to rise. *This is the first demographic dividend*. Second, a *second demographic dividend* may also arise to positively affect economic growth and overall development. More specifically, the second dividend results in when the faster growth of first dividend (i.e. rise in working age population) leads to larger savings in the short run and higher investment in the human capital and investment per worker in the long run. Important question with regard to the first demographic dividend is the impact of age structure on economic growth. More specifically, how, why and at which extent age structure influences economic growth? The total dependency ratio is purely a composite indicator to capture the change in age structure and it does not reflect the variations of earnings and the consumption according to age. This limitation is overcome in the NTA based on the economic life cycle approach (Mason *et al.* 2006) which is applied in the current paper.

The data sets for Bangladesh NTA include: (i) Household Income and Expenditure Survey (HIES) 2010 from the Bangladesh Bureau of Statistics (BBS); Labor Force Survey (LFS) 2010 from the Bangladesh Bureau of Statistics (BBS); (iv) UNFPA population prospectus data; and (iv) National Accounts Statistics (SNA) from the Bangladesh Bureau of Statistics (BBS).

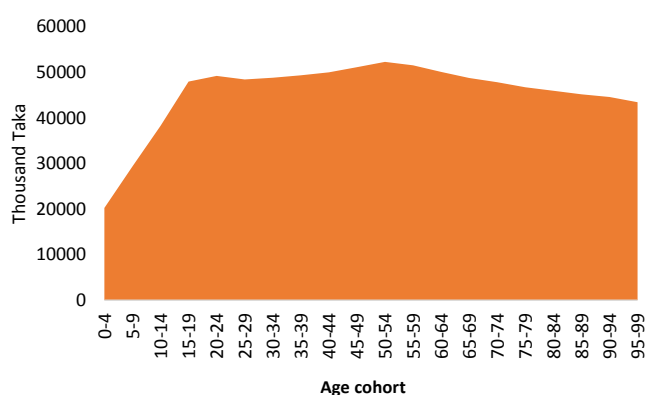
According to the NTA methodology, the life-cycle deficit (LCD) at each age is the superfluous of consumption over labor income. In order to derive the monetary value of LCD by age, it is essential to measure labor income, which, in this paper, is the aggregate of wage of employees (including both in kind and cash) and a fixed part of mixed

income (income from own business enterprise). Data of LFS has been used in this purpose. In order to derive age patterns of public and private consumption for education, health and other expenditures and labor income, member level and unit level data with public (government) and private (household) distinctions are required which is collected from the HIES 2010 data. Results from the Bangladesh NTAs 2010 have been reported under two broad headings: (i) economic lifecycle and lifecycle deficit; and (ii) economic support ration and first demographic dividend.

Economic lifecycle and lifecycle deficit

The Figure 7.6 shows the consumption profile by age. This is the combined profiles of per capita consumption of education, health care and other consumptions separated by public and private contribution. The consumption profile suggests a sharp rise in consumption alongside increasing the age, particularly for school-age consumers. Per capita yearly consumption increases sharply from about 4 years of age till it attains an early peak at about 19 years, indicating investment in education and it continues up to 25 years.

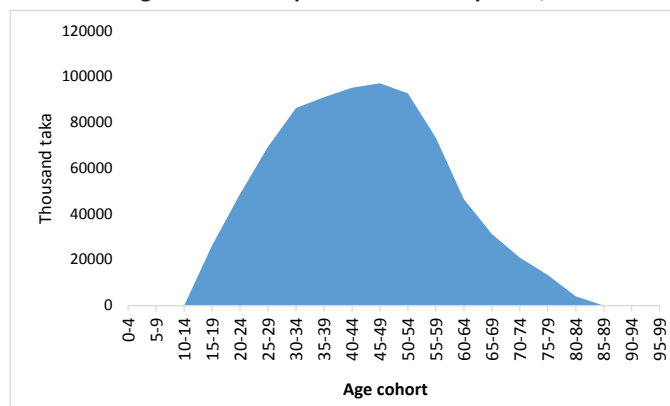
Figure 7.6: Per capita consumption profile, 2010



Source: Authors' calculation, Bangladesh National Transfer Accounts (2010)

The Figure 7.7 shows distribution of the per capita labor income according to the age profile. This reflects a number of distinctive features. It is an inverse U-shaped curve suggesting low earning potential at early ages. The labor income increases steeply till about 34 years of age, and then steadily increases between 35 and 49 years of age. Thereafter, income starts declining, and after 54, it declines rapidly with advancing age. The presence of child labor is obvious with the early age of entry into the labor force with share of labor income of young persons. The tapering income profile of the elderly is indicative of their low wages as many are self-employed, or work in the informal sector.

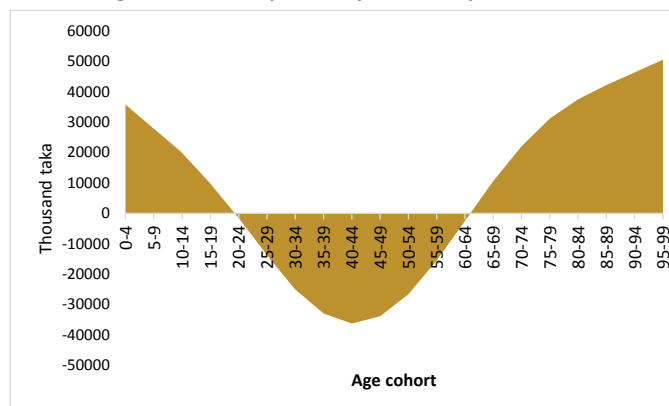
Figure 7.7: Per capita labor income profile, 2010



Source: Authors' calculation, Bangladesh National Transfer Accounts (2010)

The Figure 7.8 shows the deficit for each age group. Three distinct age groups are found in terms of LCD. As expected, two deficit groups are children (age 0 to 19) and the elderly (65 +). However, the deficit for elderly group is higher than the children perhaps indicates that low levels of income as well as higher poverty among households with children compared to household with elderly¹. The group encompassing age 20 and 64 is generating surplus in Bangladesh.

Figure 7.8: Per capita lifecycle deficit profile, 2010

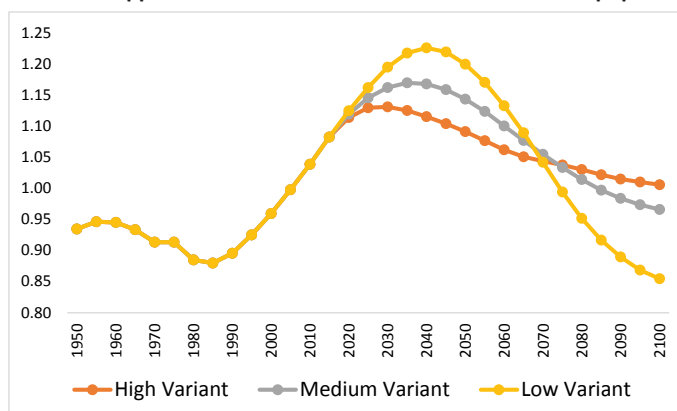


Source: Authors' calculation, Bangladesh National Transfer Accounts (2010)

The economic support ratio (ESR) and the first demographic dividend

According to the 2006 revision, several assumptions have been used by UN to project the population. Following that, eight variants underlying the fertility, mortality, constant fertility and mortality and also with international migration assumptions have been used in this paper to observe the first demographic dividend. These variants are used to observe the probable year of highest ESR with the range of the first demographic dividend. We also use it to estimate the maximum year left to harvest the benefits of the first demographic dividend.

Figure 7.9: Economic support ratio in 2010 for different variants of the population growth rate



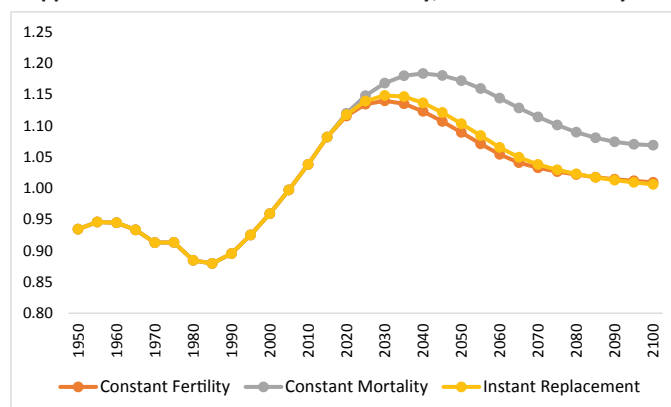
Source: Authors' calculation, Bangladesh National Transfer Accounts (2010)

Figure 7.9 shows that ESR is varying according to the various variants of the population growth rate. In particular, with high variant population growth, ESR increases positively till 2030. On the other hand, with the medium variant population growth, it increases till 2035 and with low variant it increases positively up to 2040. Thus, according to these three variants of population growth-high, medium and low, the first demographic dividend in Bangladesh will likely to stay respectively till 2030, 2035 and 2040.

¹ According to HIES 2010, head count poverty rates among households with children (age 0-18) has found to be 1.7 percentage-points higher than the national average of 31.5 percent). On the other hand, head count poverty rate among households with elderly (age 60+) has found to be 3.3 percentage-points lower than the national average (Khondker, 2014).

Figure 7.10 captures the ESR variations with respect to constant fertility, constant mortality and instant replacement rate. It is found that ESR will increase positively till 2030 with both the instant replacement and constant fertility. This suggests that the first demographic dividend will exist up to year 2030. On the other hand, with the constant mortality rate, the ESR will rise positively till 2040 and the first demographic dividend will exist up to year 2040.

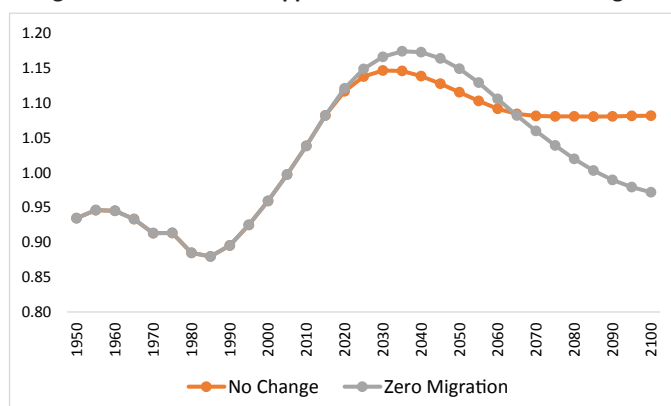
Figure 7.10: Economic support ratio in 2010 for constant fertility, constant mortality and instant replacement rate



Source: Authors' Calculation, Bangladesh National Transfer Accounts (2010)

Patterns of out migration may also affect the first demographic dividend. Figure 7.11 shows ESR patterns under zero migration. With no change in fertility-mortality, it will rise positively till 2030 suggesting that the first demographic dividend will exist up to year 2030. While with the zero migration rate, the ESR will increase positively till 2040 and the first demographic dividend will exist up to year 2040.

Figure 7.11: Economic support ratio in 2010 under zero migration



Source: Authors' Calculation, Bangladesh National Transfer Accounts (2010)

Table 7.2 summarizes the estimates of first demographic dividends under various assumptions of population growth, fertility-mortality rate and rate of migration. According to these estimates, it may be argued that the first demographic dividend in Bangladesh will continue to a point somewhere between 2030 and 2040. After that it will approach towards further change in the demographic situation.

Table 7.2: Estimated first demographic dividend under various assumption of population projection

Population with various assumptions	Year of highest ESR	Range of first demographic dividend	Years left from 2015
Fertility assumptions: convergence toward total fertility below replacement level			
High variant	2030	1990-2030	15
Medium variant	2035	1990-2035	20
Low variant	2040	1990-2040	25
Constant fertility	2030	1990-2030	15
Instant replacement	2030	1990-2030	15
Mortality assumptions			
Constant mortality	2040	1990-2040	25
Constant fertility and mortality assumption			
No change	2035	1990-2035	20
International migration assumptions			
Zero migration	2040	1990-2040	25

Source: Authors' Calculation, Based on Bangladesh National Transfer Accounts (2010)

Conclusion

Utilizing the NTA system, this paper estimates the extent of first demographic dividend using ESR. According to the estimates, the first demographic dividend predominates from 2020 to 2045 according to several population projection variants. The connection between the demographic dividends and income growth is policy dependent. The first demographic dividend is in part of the result of the growing working-age population and can be admitted if employment opportunities grow to keep pace. In order to reap the economic gains of the potential first demographic dividend, nonetheless, adequate job opportunities need to be created.

Table 7.3: Policy priority for leveraging demographic change

Phase	Issues	Recommended Policies and Strategies
1. Pre-dividend	<i>Sparking demographic transition</i>	<ul style="list-style-type: none"> Improve maternal and child health by strengthening provision of basic health care services.
	Improving human development outcomes to reduce fertility rates	<ul style="list-style-type: none"> Expand education without letting girls fall behind. Empower women, and give them access to comprehensive family planning services.
2. Early-dividend	<i>Accelerating job creation</i>	<ul style="list-style-type: none"> Invest in human capital, including vocational and technical training. Enhance labor market mobility. Reduce barriers to female labor force participation.
	Creating productive jobs for the growing share of the population in working age to reap the first demographic dividend.	<ul style="list-style-type: none"> Strengthen conditions conducive to savings and job creation (public services underpinning private sector activity, contract enforcement, financial inclusion, protection of labor rights).
3. Late-dividend	<i>Sustaining productivity growth</i>	<ul style="list-style-type: none"> Continue mobilization of savings for productive investment. Ensure that public policies across the board encourage labor-force participation of both sexes.
	Creating conditions necessary to reap the second demographic dividend and beginning to prepare for aging	<ul style="list-style-type: none"> Design cost-effective and sustainable systems for welfare and human development that address current needs (including health, child care, education, and support to vulnerable elderly) and that can be adapted to meet the needs that emerge as aging proceeds.
4. Post-dividend	<i>Post-dividend Adapting to aging</i>	<ul style="list-style-type: none"> Complete reforms of welfare systems—including pensions, health care, and long-term care—that ensure fiscal sustainability and, as part of integrated approaches, protection of the vulnerable, elderly and others, and encouragement of work among those who are able.
	Maintaining and improving welfare in the context of a declining working-age share and growing old-age share.	<ul style="list-style-type: none"> Raise labor force participation and productivity (including incentives for participation targeted at women and older cohorts; and lifelong.
		<ul style="list-style-type: none"> Pursue policies that encourage a rebound of fertility, among other things by making it easier for men and women to combine child rearing and participation in the labor market

Source: Based on Table 6.1 Global Monitoring Report (2015)

Global Monitoring report (2015) provides a list of policy priorities for leveraging demographic dividend at the country level (Table 7.3). The analysis in the previous sections suggests that Bangladesh is inching towards the

phase of late dividend (i.e. phase 3). Accordingly, Bangladesh should have implemented policies those were relevant for the early phase of demographic dividend during 1990s. However, review of policies in Bangladesh suggests that country could not make adequate investment for creating employment (i.e. investment as percent of GDP has remained short by about 3 to 4 percentage points) and in human capital including vocational and technical training (Bangladesh could manage only 2 percent investment of her GDP in education - the figure seems inadequate given much higher levels of educational investment found in other countries. Very low female labor force participation (i.e. 36 percent in 2010 compared to 82 percent male participation) envisaged existence of barriers to female labor force participation. Moreover, efforts to strengthen conditions conducive to savings and job creation are found to be insufficient considering a national saving rate in the vicinity of 30 percent and underemployment rate of more than 20 percent. Since Bangladesh did not take appropriate policies in the right time, Bangladesh may fail to exploit the benefit of the first demographic dividend.

Against these backdrops, the Seventh Five Year Plan proposes some ambitious goals with respect to investment, employment generation and skill creation. More specifically, the plan aims to increase investment by about 3 to 4 percent of GDP from the current level of 28 percent over the next five years and to increase investment in education, training and human development. Along with these, vocational training and skills development should get priority and adequate allocation. In the case of female labor force participation, Seventh Five Year Plan raised the importance of increasing female labor participation; though the plan did not elaborate the strategies. The relevant strategies may include - releasing women from domestic care activities, prohibiting child marriage, ensuring secured working condition, etc. Another positive development has been the formulation and subsequent approval of National Social Security Strategy (NSSS). The NSSS is inclusive of all population irrespective of race, religion, profession, location or ethnicity. It seeks to modernize the Bangladesh social security by combining tax-funded safety net programs with contributory social insurance and employment regulations to protect the workers.

How does Social Protection affect Labor Force Participation in Bangladesh?

Selim Raihan and Israt Jahan

Introduction

Social protection programs in Bangladesh primarily target at the reduction of poverty and issues related to basic needs of the people. There are some programs which are directly linked to the recipient of social protection programs and his/her participation in the labor force. However, empirical evidence from different countries show that social protection programs, even if they are not directly linked to any employment activities, can have important implications for labor force participation of the individuals of the households under the coverage of any of those programs. When it comes to the issue of labor force participation (LFP), there is a marked difference between male LFP and female LFP in Bangladesh. Over the last two decades, the male LFP rate has been well above 80 percent. However, though the economic growth process over the past two decades has been able to raise the rate of female LFP in Bangladesh, the rate is still very low, at around 36 percent in 2010. It suggests that there is a huge potential for the rise in female LFP in Bangladesh, which can have significant implications for economic growth and poverty alleviation in the country. Different policies, programs and economic activities can affect the female LFP; and social protection program is one of them.

The Government of Bangladesh maintains a number of social protection programs. These include vulnerable group feeding (VGF), open market sales (OPS), cash for work (CFW), food for work (FFW), vulnerable group development (VGD), gratuitous relief (GR) and a 100 days employment guarantee scheme. However, most of the programs are concentrated within the cash transfer and emergency or seasonal relief categories. It is also important to note that during 2005 and 2010, there had been a significant rise in the allocation for social protection in Bangladesh through different programs. Against this backdrop, this study explores the link between the coverage of social protection programs and labor market participation behavior of males and females in Bangladesh.

Literature Review

Ntuli (2007), in the context of South Africa, estimated labor force participation functions and the results show that participation of women in the labor market is influenced positively by non-labor income (which includes social security funds like disability grants, childcare grants and pension). The results from the study by Cipollone *et al* (2013), in the contexts of European countries, suggest that a high degree of labor market flexibility together with a high level of social protection leads to significant gains in terms of women's labor market participation. ILO (2012a) showed a clear relationship between labor force participation and social security coverage. Gilligan *et al*. (2008) evaluated the impact of productive safety net program in Ethiopia and found that both female and male, from beneficiary households of public works transfers, were less likely to undertake wage work. However, when public works transfers came together with other food security programs, such impact was reversed.

In South Asia, nearly half a billion poor people are with limited coverage of social protections. There are about 90 percent workers who work in the informal sector. It makes social protection more challenging. Countries like Bangladesh, India and Pakistan have considerable spread of social protection programs but others have very little coverage (Banerji and Rawlings 2012). Justino (2007) observed that, in India, overall expenditure on social protection had a significant positive impact on economic development as social security policies boosted the productive capacities of the poor, increased incomes and promoted employment. In Bangladesh, there is a large number of people who are self-employed both in the formal and informal sector. However, seasonality has a large impact on the labor market in Bangladesh, as in the lean season, unemployment increases and migration occurs.

Social protection program during the lean season can have a significant effect on the labor market stability in Bangladesh (BB, 2008).

Social Protection and Labor Force Participation: Insights from the Analysis of Data

A pseudo panel data

In this study, a pseudo panel data is constructed to see the effects of social protection on labor force participation, behavior of different cohorts, where cohorts are defined on the basis of percentile ranking of monthly consumption expenditure of households. The data of Household Income and Expenditure Survey (HIES) for 2005 and 2010 are used. Households in both HIES 2005 and HIES 2010 data are divided into 100 cohorts separately based on the percentile ranking, and therefore there are 200 observations in total.¹

Two different social protection variables are constructed. The first one is the *participation* variable, which shows the percent of adult male or female participating in any social protection programs for any cohort. The second variable is the *coverage* variable, which is the percent share of income from social protection in total income of any cohort.

LFP in conventional and adjusted definitions

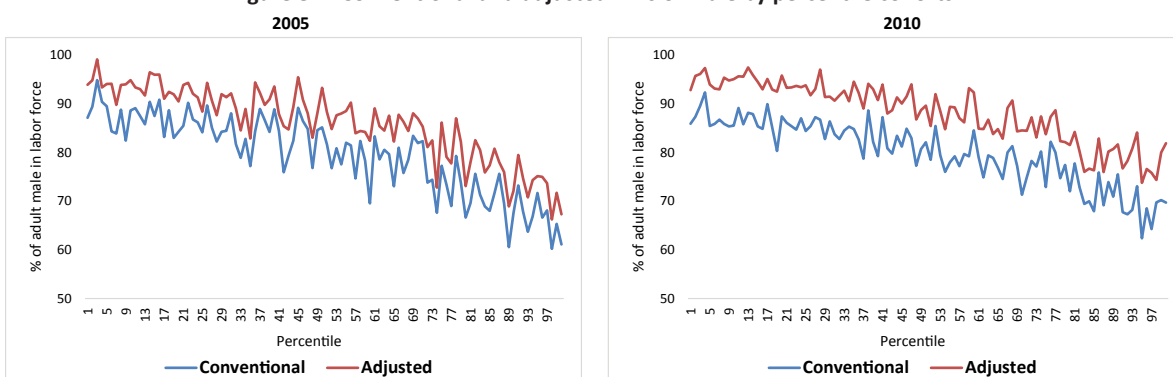
The conventional definition of LFP follows the ILO-OECD definition, which suggests that the total labor force, or currently active population, is comprised of all persons who fulfill the requirements for inclusion in the employed or the unemployed category. The time period and age restrictions are also defined. In this study, if the person was in the working age population (15 plus age) and was ready to work or was working or looking for work for the last seven days of the survey date, then the person was considered to be in the conventional labor force.

We have also used an adjusted definition of labor force to address some issues of workforce and labor force participation. In the adjusted definition, some people, who are excluded in the conventional definition, are included, as they reported several reasons behind for not working or not searching for work, which included working as unpaid work at the household, temporarily sickness, waiting for joining in a new job, job was not available or was on leave from work. We consider these persons in the adjusted labor force as they were active and would be back to the labor force in the near future. Like the conventional definition, adjusted definition of workforce also has excluded the people who were doing household work, student, too old, handicapped, retired or physically unable to work.

According to the conventional and adjusted definitions, we calculate labor force participation for both male and female for 2005 and 2010. The LFPs are also derived for each percentile. The comparison of male labor force participation rates under the conventional and adjusted LFPs are depicted in Figure 8.1. For every percentile group, the participation rate was higher for the adjusted one than for the conventional one. This pattern was similar for both 2005 and 2010. However, in 2010 the gaps between the conventional LFP and adjusted LFP for most of the percentile groups were larger. For both 2005 and 2010, the LFP lines were downward sloping, indicating that LFP rate was higher for poorer cohorts.

¹ Here it should be mentioned that for the purpose of this study we have to use the HIES data as it provides data on social protection and several other socio economic characteristics of individuals and households, which are not available in the LFS data. However, in the HIES data, the labor force participation rates of both male and female, and in particular, for female, are lower than those reported in the Labor Force Survey (LFS) data. Since, we are interested in the relationship between social protection and LFP, such discrepancies between HIES and LFS data would not be a problem for our study.

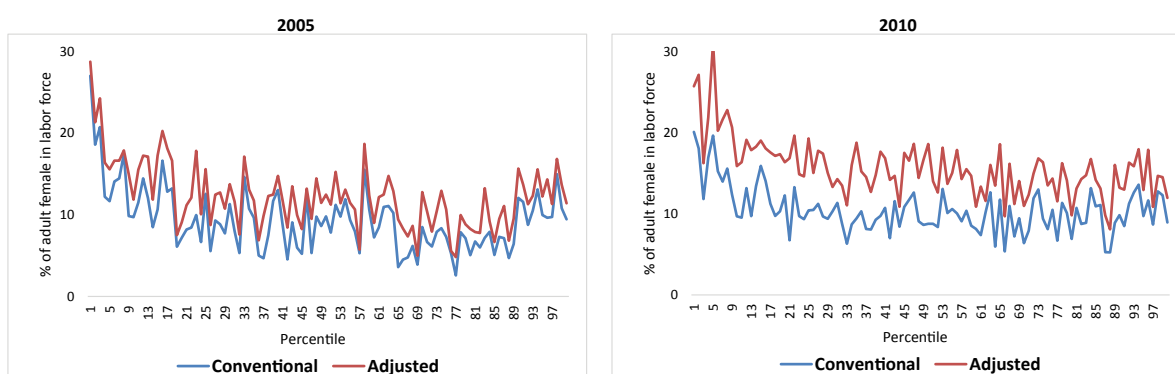
Figure 8.1: Conventional and adjusted LFPs of male by percentile cohorts



Source: Data from HIES 2005 and 2010, BBS, Bangladesh

The comparisons of the female LFP between two definitions have been presented in Figure 8.2. The gaps between the conventional and adjusted LFP rates in 2010 were much higher than those in 2005. The LFP rate was higher for the poorer cohorts. In 2010, the gap between two lines became much larger for the poorer cohorts, which suggests that a higher percentage of unpaid female family labor in the poorer cohorts were included in the adjusted LFP in 2010.

Figure 8.2: Conventional and adjusted LFPs of female by percentile cohorts



Source: Data from HIES 2005 and 2010, BBS, Bangladesh

Overall LFP rates and participation in the social protection by male and female

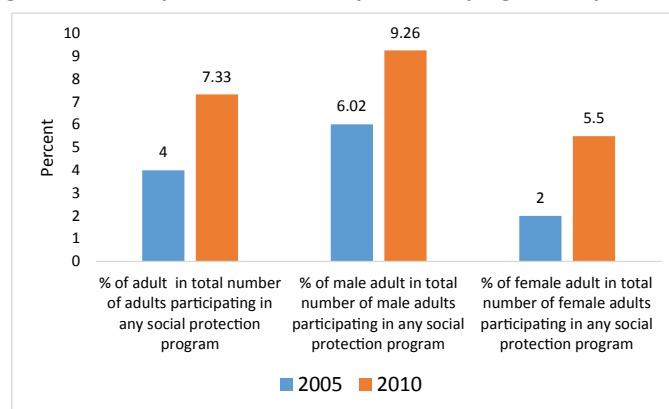
The labor force participation rates calculated from the HIES data showed that the total labor force participation rate were somehow unchanged between 2005 and 2010. The adjusted labor force participation rates calculated from HIES were higher than the conventional ones and the gaps were larger in 2010 (Table 8.1). LFP rates for males under both the definitions were closer to the LFP rates reported in the LFS (86.8 percent and 82.5 percent in 2005 and 2010 respectively). For females, according to the LFS, the LFP rate was 29.2 percent in 2005 and 36 percent in 2010. From the HIES data, according to the conventional LFP definition, the female LFP rate increased from 9.40 percent in 2005 to 10.45 percent in 2010, and according to the adjusted definition, the female LFP rates were 12.56 percent and 15.71 percent in 2005 and 2010 respectively.

Table 8.1: Labor force participation rates as per the HIES (%)

	2005	2010
Total adult (conventional definition)	44.35	44.14
Total adult (adjusted definition)	45.68	51.43
Male adult (conventional definition)	79.21	79.7
Male adult (adjusted definition)	84.24	88.05
Female adult (conventional definition)	9.40	10.45
Female adult (adjusted definition)	12.56	15.71

Source: Data from HIES 2005 and 2010

Figure 8.3: Participation in the social protection programs as per the HIES



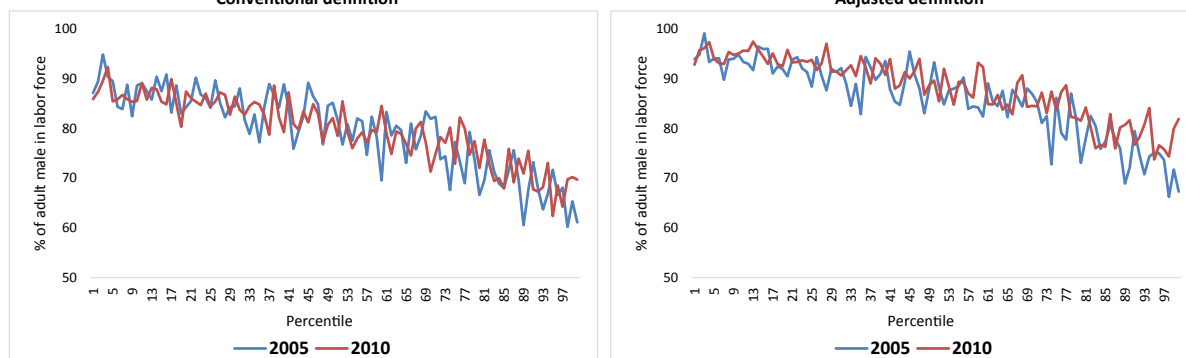
Source: Data from HIES 2005 and 2010

Figure 8.3 suggests that the overall participation of adults in the social protection programs increased from 4 percent in 2005 to 7.33 percent in 2010. The rate of participation in social protection programs was always higher for male than female adults. In 2010, the participation rate was 9.26 percent for male adults, whereas it was only 5.5 percent for female adults.

LFP rate and participation in the social protection for male and female from the pseudo panel data

The trend in the percentage of adult male and female in the labor force is shown in Figure 8.4 and 8.5. The x-axis shows the cohorts that are organized in ascending order on the basis of monthly consumption expenditure. The first cohort is the poorest one and the 100th one is the richest cohort. Figure 8.4 presents the LFP rates of adult males for each cohort in 2005 and 2010 under the conventional and adjusted definitions. The trend shows that male LFP rate was downward sloping in relation to the income cohort for both the years. The adjusted trend shows flatter lines than the conventional one. The conventional trends do not show significant change between 2005 and 2010 when it comes to male LFP. But in adjusted trend, among the highest percentiles the gaps between 2005 and 2010 widened.

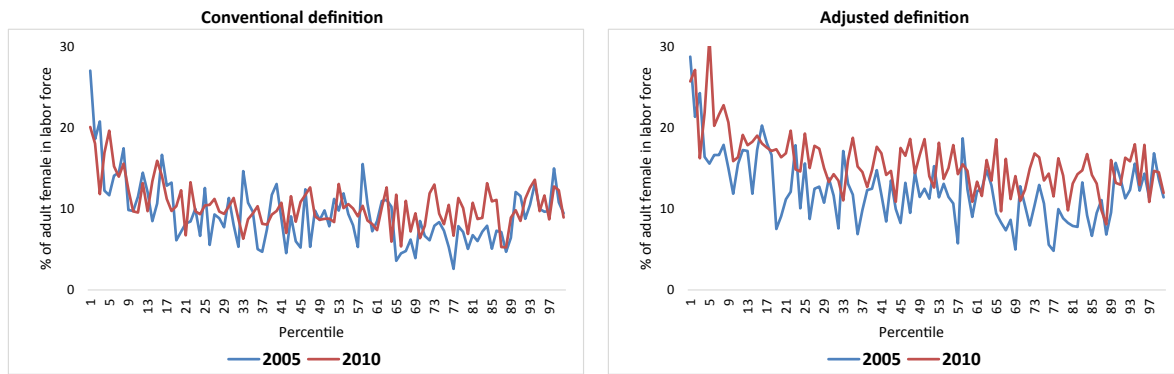
Figure 8.4: Percentage of adult male in the labor force in any percentile cohort
Conventional definition Adjusted definition



Source: Data from HIES 2005 and 2010

Figure 8.5 presents the LFP rates of adult females for each cohort in 2005 and 2010 under conventional and adjusted definitions. The trends were similar for both the years but the gaps were significant in the adjusted one. The changes are much clear in the LFP with adjusted definition. In the lower percentiles the LFPs for females were higher than those of the higher percentiles.

Figure 8.5: Percentage of adult female in the labor force in any percentile cohort

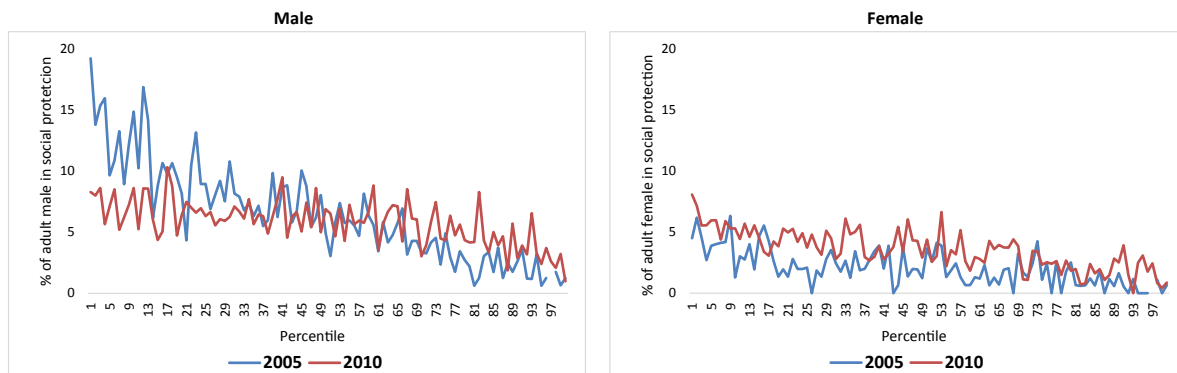


Source: Data from HIES 2005 and 2010

The constructed panel data shows that, based on the adjusted definition, the 1st, 25th, 50th and 75th percentiles had, in 2005, respectively 28.8 percent, 15.6 percent, 12.5 percent and 10.6 percent female LFP; and in 2010 the corresponding figures were 25.7 percent, 19.3 percent, 18.6 percent and 13.5 percent respectively. Actually, out of 100 percentile cohorts, 83 experienced rise in the rate of female LFP during 2005 and 2010.

Figure 8.6 represents the percentage of adult males and females under any social protection program in 2005 and 2010. Trend lines for males suggests that the participation in social protection programs fell in 2010 for the lower percentiles but increased for the upper percentiles compared to those in 2005. Females participating in social protection increased over time, and as high as 83 percentile cohorts experienced rise in the *participation*. For females, 1st, 25th, 50th and 75th percentiles had, in 2005, respectively 4.5 percent, 2 percent, 3.6 percent and 2.5 percent social protection *participation*, and in 2010 the corresponding figures were 8 percent, 3.7 percent, 4.4 percent and 2.5 percent respectively. Figure 8.6 also shows that upper percentile groups were getting sizeable social protection.

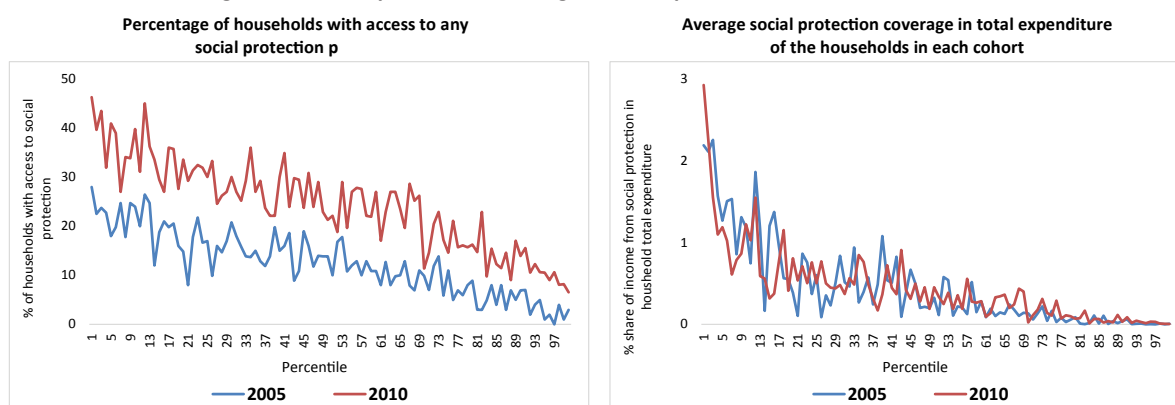
Figure 8.6: Percentage of adult male and female under any social protection programs



Source: Data from HIES 2005 and 2010

Figure 8.7 presents the percentages of households in each cohort that had access to social protection programs. The first part of Figure 8.7 shows that the percentage of households under any social protection programs has increased significantly from 2005 to 2010. The second part of Figure 8.7 presents the social protection *coverage* in each cohort for those two years. It shows that out of 100 cohorts, 55 cohorts experienced rise in the *coverage*. In the case of social protection *coverage*, 1st, 25th, 50th and 75th percentiles had, in 2005, respectively 2.19 percent, 0.60 percent, 0.32 percent and 0.16 percent *coverage*, and in 2010 the corresponding figures were 2.93 percent, 0.51 percent, 0.45 percent and 0.11 percent respectively. But the trend of percentage share of income from social protection in household expenditure shows interesting facts. In the lowest percentile groups, though the importance of income from social protection with respect to their total household expenditure is higher compared to those in the upper percentile groups, such importance declined in 2010 compared to that in 2005.

Figure 8.7: Participation and coverage of social protection at the household level



Source: Data from HIES 2005 and 2010

Household category and social protection

Tables 8.2 and 8.3 explain how participation in social protection varies among different households in rural and urban areas. According to Table 8.2, in the lowest percentile (1-10) group, 14.93 percent of adult rural males were under social protection programs in 2005; that rose to 16.13 percent in 2010. 9.56 percent of adult urban male were under social protection programs in 2005 which rose to 12.41 percent in 2010. In the highest percentile (91-100) group, the percentage of adult rural males under social protection programs increased from 2.98 percent in 2005 to 8.19 percent in 2010. For the urban male, such figures were 0.51 percent in 2005 and 2.49 percent in 2010.

Table 8.2: Percentage of adult male under social protection

Percentile	Rural		Urban	
	2005	2010	2005	2010
1-10	14.93	16.13	9.56	12.41
11-20	11.36	15.47	8.33	9.23
21-30	10.49	13.36	5.19	7.18
31-40	8.75	13.88	3.20	5.25
41-50	8.80	13.59	3.73	6.86
51-60	7.22	12.13	3.15	6.04
61-70	5.72	11.75	2.26	4.32
71-80	4.23	10.40	1.32	4.23
81-90	3.37	9.44	0.70	3.39
91-100	2.98	8.19	0.51	2.49

Source: Data from HIES 2005 and 2010

For female adults the scenario is a bit similar (Table 8.3). In the lowest percentile (1-10) group, 4.37 percent of adult rural females were under social protection programs in 2005 which rose to almost 12 percent in 2010. On the other hand, the percentage of adult females in urban areas was 3.69 percent in 2005 and it rose to 7.70 percent in 2010. In the highest percentile (91-100) group, a very small percent (0.80 percent) of adult rural females were under social protection programs in 2005, which increased to 4.06 percent in 2010. For the urban area such rise was very small, from 0.08 percent in 2005 to 0.92 percent in 2010.

Table 8.3: Percentage of adult female under social protection

Percentile	Rural		Urban	
	2005	2010	2005	2010
1-10	4.37	11.72	3.69	7.70
11-20	3.43	8.19	3.06	6.70
21-30	2.03	8.38	1.78	4.66
31-40	3.05	7.51	1.31	3.54
41-50	2.26	6.85	1.49	4.44
51-60	2.21	6.77	1.78	2.25
61-70	1.49	5.38	1.63	3.71
71-80	2.71	4.08	0.45	2.23
81-90	1.56	3.06	0.36	1.72
91-100	0.80	4.06	0.08	0.92

Source: Data from HIES 2005 and 2010

Education and social protection

Table 8.4 shows the percentage of people (adult and child) under social protection programs by years of education. With no education, 7.38 percent of males were under social protection programs in 2005, and that rose to 9.94 percent in 2010. 2.74 percent of females with no education were under social protection programs in 2005, and that rose to 6.69 percent in 2010. With 5 years of education, 3.78 percent and 6.07 percent of males were under social protection programs in 2005 and 2010 respectively. For such education level, 0.97 percent of females were under social protection programs in 2005, which rose to 3.25 percent in 2010.

Table 8.4: Percentage of people (adult and child) under social protection programs by years of education

Years of education	Male		Female	
	2005	2010	2005	2010
0	7.38	9.94	2.74	6.69
1	0.87	4.24	0.00	2.76
2	1.52	8.25	0.32	9.53
3	2.39	11.43	0.81	7.91
4	3.14	7.89	0.56	7.03
5	3.78	6.07	0.97	3.25
6	1.64	6.40	0.23	7.69
7	2.24	5.85	0.71	5.83
8	3.12	5.39	0.41	3.72
9	1.55	4.25	0.07	2.90
10	1.34	4.66	0.17	2.63
12	0.46	0	0.20	0
16	0.70	4.61	0.75	0.65
17	0.28	0	0.00	0

Source: Data from HIES 2005 and 2010

Table 8.5: Percentage of adult population under social protection programs by years of education

Years of education	Male		Female	
	2005	2010	2005	2010
0	11.94	16.24	3.78	9.03
1	7.69	5.45	0.00	4.17
2	6.32	12.82	2.13	9.09
3	6.22	14.98	2.41	3.13
4	5.78	10.49	1.21	4.01
5	4.83	7.09	0.98	2.68
6	2.56	9.28	0.40	1.09
7	3.01	6.64	0.70	2.51
8	3.54	5.84	0.29	2.67
9	1.64	4.37	0.07	2.16
10	1.35	4.68	0.17	2.59
12	0.46	0	0.20	0
16	0.70	4.61	0.75	0.65
17	0.28	0	0.00	0

Source: Data from HIES 2005 and 2010

Table 8.5 shows the percentage of adults under social protection programs by years of education. 11.94 percent adult males who didn't have education, were under social protection coverage in 2005. For females it was 3.78 percent. The percentage rose to 16.24 percent for males and 9.03 for females in 2010. With 5 years of education, 4.83 percent of adult males were under social protection programs in 2005, which rose to 7.09 percent in 2010. 0.98 percent of adult females were under social protection programs in 2005, which rose to 2.68 percent in 2010.

Land ownership and social protection

Table 8.6 suggests that, 6.81 percent of adult males who were landless were under social protection in 2005, the share decreased to 6.56 percent in 2010. 4.75 percent of landless adult females were under social protection in 2005, which rose to 7.52 percent in 2010. With ownership of 0.01-0.49 acres of land, 7.21 percent of adult males were included in social protection in 2005. In 2010, it rose 8.37 percent. For the adult females of that group the percentage was 2.49 percent in 2005 and 6.07 percent in 2010.

Table 8.6: Percentage of adult population under social protection programs by land (total) ownership

Land size (in acre)	Male		Female	
	2005	2010	2005	2010
Landless	6.81	6.56	4.75	7.52
0.01-0.49	7.21	8.37	2.49	6.07
0.50-0.99	6.76	13.94	0.90	4.98
1.00-2.49	3.89	14.02	0.52	3.71
2.50-7.49	1.86	12.47	0.16	3.77
7.50+	1.19	6.29	0.92	5.37

Source: Data from HIES 2005 and 2010

Age, location and social protection

Table 8.7 shows that, for both male and female, the coverage of social protection programs is higher in rural areas than in urban areas. Also, the coverage is higher for the older age groups. In general, the coverage increased for all age groups in 2010 compared to that in 2005.

Table 8.7: Percentage of male and female under social protection programs by region and age

Age category	Male				Female			
	Rural		Urban		Rural		Urban	
	2005	2010	2005	2010	2005	2010	2005	2010
5-14	0.29	6.13	0.14	1.26	0.37	10.16	0.14	3.59
15-25	1.02	2.18	0.39	1.18	0.36	3.27	0.22	1.65
26-35	7.24	11.26	3.14	4.13	1.48	3.80	0.56	1.54
36-45	12.22	16.14	3.94	6.91	2.83	5.96	2.34	2.94
46-55	13.38	16.80	6.00	8.20	4.46	9.27	2.07	4.77
56-65	14.27	23.97	4.06	11.01	6.34	14.64	1.42	9.57
66-75	12.78	28.30	9.34	16.46	6.76	24.33	7.77	13.90
75 +	12.02	25	2.35	22.55	8.38	18	7.14	17

Source: Data from HIES 2005 and 2010

Employment category and social protection

The distribution of males and females in different employment categories shows dynamics of the coverage of social protection coverage (Table 8.8). The coverage for self-employed and wage employed, both for male and female, increased in 2010 compared to those in 2005; however such rise is very prominent for male self-employed and female wage employed. The coverage of the social protection for unemployed people was poor, both for male and female, both in 2005 and 2010.

Table 8.8: Percentage of people under social protection programs by employment category

Employment category	2005	2010
Male self employed	5.32	12.61
Male wage employed	8.04	9.53
Male unemployed	1.76	2.65
Female self employed	8.83	13.93
Female wage employed	6.47	12.21
Female unemployed	4.76	2.73

Source: Data from HIES 2005 and 2010

Segregation of employment categories by farm and non-farm activities shows that while in 2005 there was a mixed picture, non-farm activities were more targeted by social protection programs than the farm activities in 2010 (Table 8.9).

Table 8.9: Percentage of people under social protection programs by sector and employment category

Employment category	Farm		Nonfarm	
	2005	2010	2005	2010
Male self employed	5.26	7.95	5.37	17.15
Male wage employed	15.47	6.19	5.21	17.33
Female self employed	7.22	8.33	9.45	20.71
Female wage employed	13.40	9.15	5.16	28.39

Source: Data from HIES 2005 and 2010

Remittance and social protection

Table 8.10 shows that, despite some mixed patterns in 2005, in 2010, compared to the remittance receiving households, males and females from non-remittance receiving households were under larger social protection coverage.

Table 8.10: Remittance and coverage of social protection

Status of remittance receipt	Male		Female	
	2005	2010	2005	2010
Remittance non-receiving household	6.45	10.43	1.76	6.06
Remittance receiving household	4.84	7.96	2.55	2.97
Remittance non-receiving household (Internal)	6.12	10.01	1.70	5.57
Remittance receiving household (Internal)	5.66	14.54	3.07	5.58
Remittance non-receiving household (international)	6.39	10.60	2.10	6.05
Remittance receiving household (international)	2.21	4.64	1.11	1.76

Source: Data from HIES 2005 and 2010

Social Protection and Labor Force Participation: Insights from Econometric Analysis

Table 8.11 presents the pseudo panel regression results for the adult female labor force participation using the conventional definition. Here we present results using three estimation methods: robust, fixed effect and random effect. In general, age, marriage, being in the rural area have statistically significant negative impacts on the female labor force participation. On the other hand, education has a strong positive statistically significant impact. We have used two social protection variables: participation and the coverage. In both the robust and random effect models, social protection participation and social protection coverage have positive and statistically significant impact on female labor force participation: 1 percent rise in the *participation* leads to 0.42 percent rise in the female LFP, and 1 percent increase in the *coverage* leads to 3.35 percent rise in the female LFP. In case of the fixed effect model, however, though the coefficients of the participation and coverage variables are positive, they are not statistically significant.

Table 8.11: Pseudo panel regression results on adult female labor force participation (conventional)

Explanatory variables	Dependent variable: Female labor force participation					
	Regression model with social protection participation			Regression model with social protection coverage		
	Robust	Fixed Effect	Random Effect	Robust	Fixed Effect	Random Effect
Age	-0.005** (0.003)	-0.005 (0.003)	-0.005** (0.002)	-0.006** (0.003)	-0.006 (0.003)	-0.006** (0.002)
Average years of Schooling	0.022*** (0.005)	0.019*** (0.007)	0.022*** (0.005)	0.021*** (0.005)	0.020*** (0.007)	0.021*** (0.004)
Marriage	-0.197*** (0.062)	-0.181** (0.083)	-0.197*** (0.061)	-0.138** (0.061)	-0.172** (0.082)	-0.138** (0.060)
Female headed household	0.035 (0.064)	0.034 (0.075)	0.035 (0.057)	0.052 (0.058)	0.038 (0.074)	0.052 (0.054)
Ill member in household	0.024 (0.042)	0.009 (0.048)	0.024 (0.034)	0.005 (0.040)	0.010 (0.047)	0.005 (0.032)
Household member with age 65 plus	-0.258 (0.286)	-0.095 (0.338)	-0.258 (0.255)	-0.237 (0.275)	-0.112 (0.333)	-0.237 (0.239)
Household member with age under 5	0.182 (0.133)	0.141 (0.159)	0.182 (0.112)	0.010 (0.125)	0.104 (0.157)	0.010 (0.108)
Rural	-0.150*** (0.034)	-0.052 (0.060)	-0.150*** (0.031)	-0.114*** (0.032)	-0.051 (0.059)	-0.114*** (0.030)
Household size	-0.015 (0.011)	-0.026* (0.014)	-0.015 (0.009)	-0.011 (0.010)	-0.022 (0.014)	-0.011 (0.009)
Land holding	0.021 (0.077)	0.076 (0.092)	0.021 (0.059)	0.034 (0.067)	0.084 (0.092)	0.034 (0.055)
Social protection participation	0.417** (0.164)	0.108 (0.228)	0.417*** (0.154)			
Social protection coverage				3.345*** (0.550)	1.292 (1.103)	3.345*** (0.614)
Constant	0.641*** (0.146)	0.603*** (0.187)	0.641*** (0.129)	0.565*** (0.135)	0.586*** (0.186)	0.565*** (0.123)
Number of observation	200	200	200	200	200	200
F		2.3			2.42	
chi2	148.56		182.51	357.04		234.93

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Table 8.12: Pseudo panel regression results on adult female labor force participation (adjusted)

Explanatory variables	Dependent variable: Female labor force participation					
	Regression model with social protection participation			Regression model with social protection coverage		
	Robust	Fixed Effect	Random Effect	Robust	Fixed Effect	Random Effect
Age	-0.006** (0.003)	-0.006 (0.004)	-0.006** (0.003)	-0.006** (0.003)	-0.006* (0.004)	-0.006** (0.003)
Average years of schooling	0.036*** (0.005)	0.026*** (0.008)	0.036*** (0.005)	0.035*** (0.005)	0.028*** (0.008)	0.035*** (0.005)
Marriage	-0.214*** (0.069)	-0.219** (0.093)	-0.214*** (0.069)	-0.149** (0.067)	-0.204** (0.092)	-0.149** (0.068)
Female headed household	0.095 (0.067)	0.099 (0.085)	0.095 (0.064)	0.120* (0.062)	0.107 (0.083)	0.120** (0.061)
Ill member in household	-0.010 (0.041)	-0.006 (0.054)	-0.010 (0.038)	-0.032 (0.039)	-0.004 (0.053)	-0.032 (0.037)
Household member with age 65 plus	0.079 (0.308)	0.271 (0.381)	0.079 (0.287)	0.130 (0.288)	0.243 (0.372)	0.130 (0.269)
Household member with age under 5	0.036 (0.138)	-0.101 (0.179)	0.036 (0.126)	-0.158 (0.135)	-0.165 (0.175)	-0.158 (0.122)
Rural	-0.081** (0.035)	0.032 (0.067)	-0.081** (0.035)	-0.037 (0.035)	0.034 (0.066)	-0.037 (0.034)
Household size	-0.005 (0.011)	-0.021 (0.015)	-0.005 (0.010)	-0.001 (0.011)	-0.015 (0.016)	-0.001 (0.010)
Land holding	-0.122 (0.081)	-0.053 (0.104)	-0.122* (0.066)	-0.110 (0.070)	-0.039 (0.102)	-0.110* (0.062)
Social protection participation	0.557*** (0.178)	0.189 (0.257)	0.557*** (0.174)			
Social protection coverage				3.796*** (0.612)	2.198* (1.232)	3.796*** (0.695)
Constant	0.635*** (0.150)	0.611*** (0.210)	0.635*** (0.145)	0.556*** (0.140)	0.583*** (0.208)	0.556*** (0.139)
Number of observation	200	200	200	200	200	200
F		8.39			8.84	
chi2	242.64		263.84	400.87		310.72

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

The results are almost similar for the regression involving female labor force participation with the adjusted definition (Table 8.12). But in this case the variables like female headed households (with a positive sign) and landholding (with a negative sign) turn out to be statistically significantly related to the adjusted female LFP in the regression involving social protection *coverage*. Also, social protection coverage variable turns out to be statistically significant with a positive sign in the fixed effect model. Furthermore, the sizes of the statistically significant coefficients on participation and coverage of social protection under the robust and random effect models appear to be bigger than those observed in Table 8.11.

In contrast, Table 8.13 shows that, under the conventional definition, while age and household size have negative significant effect, marriage, being in the rural area, and dependency ratio (proportion of household member with age under 5) have positive effects on male labor force participation. The social protection coverage variable doesn't appear to be statistically significant. However, social protection participation variable turns out to be statistically significant with a positive impact on male labor force participation under the random effect model.

Table 8.14 presents pseudo panel regression results on adult male labor force participation using the adjusted definition. The results are similar to those reported in Table 8.13. However, here, landholding also appears to be statistically significant with a negative sign and none of the two social protection variables are statistically significant under any estimation method.

Table 8.13: Pseudo panel regression results on adult male labor force participation (conventional)

Explanatory variables	Dependent variable: Male labor force participation					
	Regression model with social protection participation			Regression model with social protection coverage		
	Robust	Fixed Effect	Random Effect	Robust	Fixed Effect	Random Effect
Age	-0.008*** (0.002)	-0.004 (0.003)	-0.008*** (0.002)	-0.008*** (0.002)	-0.004 (0.003)	-0.008*** (0.002)
Average years of schooling	-0.005 (0.005)	0.005 (0.007)	-0.005 (0.005)	-0.006 (0.005)	0.005 (0.007)	-0.006 (0.005)
Marriage	0.395*** (0.078)	0.236** (0.099)	0.395*** (0.071)	0.393*** (0.080)	0.235** (0.100)	0.393*** (0.071)
Male headed household	0.026 (0.053)	-0.025 (0.078)	0.026 (0.056)	0.015 (0.051)	-0.028 (0.078)	0.015 (0.058)
Ill member in household	-0.000 (0.036)	0.058 (0.054)	-0.000 (0.037)	0.012 (0.037)	0.070 (0.052)	0.012 (0.037)
Household member with age 65 plus	-0.283 (0.247)	-0.361 (0.337)	-0.283 (0.251)	-0.346 (0.251)	-0.396 (0.343)	-0.346 (0.251)
Household member with age under 5	-0.077 (0.103)	0.392** (0.180)	-0.077 (0.120)	-0.044 (0.098)	0.442*** (0.168)	-0.044 (0.120)
Rural	0.076** (0.031)	-0.080 (0.066)	0.076** (0.033)	0.080** (0.032)	-0.084 (0.066)	0.080** (0.034)
Household size	-0.014 (0.010)	-0.059*** (0.016)	-0.014 (0.010)	-0.017* (0.009)	-0.062*** (0.016)	-0.017* (0.010)
Land holding	-0.036 (0.068)	0.033 (0.105)	-0.036 (0.062)	-0.036 (0.069)	0.032 (0.105)	-0.036 (0.063)
Social protection participation	0.174 (0.106)	0.095 (0.134)	0.174* (0.101)			
Social protection coverage				0.327 (0.670)	-0.017 (1.226)	0.327 (0.669)
Constant	0.902*** (0.092)	1.019*** (0.140)	0.902*** (0.096)	0.912*** (0.091)	1.029*** (0.144)	0.912*** (0.097)
Number of observation	200	200	200	200	200	200
F		8.618			8.529	
chi2	1,796.263		1,340.869	1,775.488		1,318.755

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Table 8.14: Pseudo panel regression results on adult male labor force participation (adjusted)

Explanatory variables	Dependent variable: Male labor force participation					
	Regression model with social protection participation			Regression model with social protection coverage		
	Robust	Fixed Effect	Random Effect	Robust	Fixed Effect	Random Effect
Age	-0.002 (0.002)	0.002 (0.003)	-0.002 (0.002)	-0.001 (0.002)	0.002 (0.003)	-0.001 (0.002)
Average years of schooling	0.002 (0.005)	0.008 (0.006)	0.002 (0.004)	0.001 (0.005)	0.008 (0.006)	0.001 (0.004)
Marriage	0.182*** (0.062)	0.055 (0.083)	0.182*** (0.057)	0.183*** (0.063)	0.051 (0.083)	0.183*** (0.058)
Male headed household	0.072 (0.049)	0.051 (0.065)	0.072 (0.046)	0.069 (0.048)	0.051 (0.065)	0.069 (0.047)
Ill member in household	0.018 (0.035)	0.090** (0.045)	0.018 (0.030)	0.030 (0.034)	0.091** (0.043)	0.030 (0.030)
Household member with age 65 plus	0.040 (0.187)	-0.231 (0.283)	0.040 (0.204)	0.000 (0.191)	-0.207 (0.288)	0.000 (0.203)
Household member with age under 5	-0.249 (0.095)	0.092 (0.151)	-0.249 (0.097)	-0.219 (0.085)	0.109 (0.141)	-0.219 (0.097)
Rural	0.096*** (0.026)	-0.026 (0.055)	0.096*** (0.027)	0.096*** (0.027)	-0.028 (0.055)	0.096*** (0.027)
Household size	-0.013* (0.007)	-0.054*** (0.014)	-0.013* (0.008)	-0.015** (0.007)	-0.056*** (0.013)	-0.015* (0.008)
Land holding	-0.117* (0.063)	0.023 (0.088)	-0.117* (0.050)	-0.121* (0.063)	0.022 (0.088)	-0.121** (0.051)
Social protection participation	0.121 (0.096)	0.015 (0.113)	0.121 (0.082)			
Social protection coverage				-0.058 (0.503)	-0.462 (1.028)	-0.058 (0.542)
Constant	0.908*** (0.074)	0.999*** (0.118)	0.908*** (0.078)	0.914*** (0.073)	1.014*** (0.121)	0.914*** (0.079)
Number of observation	200	200	200	200	200	200
F		14.338			14.383	
chi2	2,583.318		1,908.711	2,523.195		1,884.668

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Conclusion

Our study finds that female labor force participation in Bangladesh increases if either she has a direct provision to the social protection program or her household is under the coverage of any social protection programs, so that the income from which can support a part of her household expenditures. Therefore, to promote female labor force participation, social protection programs can be very instrumental. The policy implications are very clear. Providing social protection directly to the female can bring them to participate in the labor force. Also, supporting other members of the household with any type of social protection can also facilitate the female labor force participation.

We have also found that, males' access to social protection programs does not have any significant impact on their labor force participation. However, such provision should not be discouraged as it may have a dynamic impact on the labor force participation of the female members of the household. Male's income from social protection increases the coverage of social protection in terms of household's total expenditure, which can facilitate rise in the female labor force participation. Furthermore, the provision of social protection programs for the dependent members of the households (both young and elderly dependents) helps females of the households as it reduces their burden of care works, which can also act as a stimulator for their labor force participation.

How do Education and Skill development affect the Transition from ‘Good-enough’ Job to ‘Decent’ Job?

Selim Raihan and Mahtab Uddin

Introduction

In the arena of economic literature, it is now well established that, although economic growth is a necessary condition for development it is not sufficient (Sen, 1999). In addition, increasingly there is a consensus among academicians that employment creation does not necessarily promise social and economic inclusion or basic human rights as chartered by the UN system. Within this context, the focus of the policy exercise has shifted from mere economic growth approach towards a broader approach of inclusive growth. The International Labor Office’s ‘Decent Work’ agenda replicates the importance of such context. Although, the decent work agenda has been initiated since 1999, the ongoing current literatures either are highly concentrated on policy implications or depict the decent work agenda from a macro point of view. Majority of studies conducted on decent job primarily focused on the demand side issues. However, there is a need to explore the supply side issues as the composition of labor supply itself can be a determining factor for the status of decent job. This article follows the definitions of ‘good-enough’ job, ‘good’ job and ‘decent’ job from Raihan (2014) where it is argued that there could be three stages for moving towards ‘decent’ job. The first stage is the ‘good-enough’ job which shows the transition from no job to job or from unpaid family job to paid-job. The second stage is the ‘good’ job which shows the transition from ‘good-enough’ job to job with better return, formal job security and enhanced workers’ rights. The third stage is the ‘decent’ job, which is the transition from ‘good’ job to a state of productive employment in compliance with agreed international standards of working environment and workers’ rights.

Literature Review

Most of the studies on decent work, using country level macro data, primarily focused on demand side issues. Ghai (2003) examined different indicators for measuring and comparing decent work status of the OECD countries, using the country level aggregate data. He formulated an index to measure the performances and patterns of decent work in the industrial countries in the 1990s, and found that, some countries like Sweden, Denmark and Norway performed better than other OECD countries. Analogous to Ghai (2003), Anker *et al.* (2002) identified various statistical indicators to measure decent work in a cross country perspective. In the context of Bangladesh, Mujeri (2004) assessed the availability of the decent work statistical indicators for the country and constructed an aggregate scenario of the decent work environment, and identified that the quality, coverage of the data as well as comparability and consistency of the data over time were the major challenges.

A number of papers identified the informal sector as the major vulnerable and challenging sector for the implementation of the decent job agenda. Cohen and Moodley (2012), in the case of South Africa, found that the major challenges for decent work were the poor working conditions, workers’ exploitation in the growing informal sector, and implementation of social protection and social dialogue which included the informal sectors. Amin (2002) argued for an integral approach for ensuring decent work for the workers in the informal sector in the Asian countries. Ahn (2008) discussed the challenges of growing informal employment in South Asia and analyzed measurable indicators of decent work in the informal economy. The author argued that, in order to introduce an environment conducive to promoting decent work – it would be inevitable to organize and mobilize workers in need through promotion of social dialogue. In line with this argument, Servais (2004) proposed that, the states should give the workers a more significant part to play in the regulatory process, and suggested that the key role of the national, regional and local authorities should include identification and recognition of the social actors, promotion of access to information by eliminating hindrances such as anti-union practices and by taking part in their establishments.

Some studies stressed importance on the enhancement of global value chains and broader trade arrangements to promote compliance with labor standards. Trade agreements and supply chain relationship can put pressures on governments and businesses to improve conditions for workers (Polaski, 2009). Pressure from civil society campaigns, and in light of increasingly aware consumers, quality now includes social and environmental issues (Barrientos, 2007). This is putting pressure on producers to improve employment conditions, and ensure labor standards are met.

Although the aforementioned papers looked primarily at the demand side issues, there is a need to consider the supply side effects too as far as the promotion of decent job is concerned. Indeed, for a sustainable improvement in the working condition as well as the lives of the workers there is no other alternative but to enhance the productivity of the workers through skill development, i.e. through education and training. The objective of the current study is to explore on how education and training can play the role in improving the quality of employment.

The Labor Market in Bangladesh: How does it stand in terms of Quality of Employment?

Classification of the quality of employment

We have used the Labor Force Survey data of 2010 (LFS 2010) for Bangladesh and the available indicators in that survey to classify the jobs as per the definitions suggested by Raihan (2014). As the data and questions in the questionnaire of LFS (2010) are different for wage employed and self-employed, we had to set different definitions for these categories.

Following Raihan (2014), in the case of wage employment, we have defined decent job as a job which is permanent, has a written job contract, decent working hour, decent and adequate earnings, leave, pension, and termination notice. On the contrary, a job is 'good-enough' if he/she has at least a paid job. In between 'decent' job and 'good-enough' job there is 'good' job which is defined as having a permanent employment along with a decent earning. Following ILO (2012), decent earning is defined as earnings which is higher than 2/3rd of the median income. The decent working hour is defined as working hour which is neither low nor excessive and lies in between 35 – 48 hours per week.

Following Raihan (2014), in the case of self-employment, we consider 'decent job' as a job with decent earnings, permanent employment, and decent working hours, while the definitions of 'good' job and 'good-enough' job remain the same. A challenge that we faced in case of self-employment was the missing data problem of the income of the self-employed. We applied the technique of multiple imputations by chained equations (MICE) for determining the missing incomes from the available observable characteristics¹.

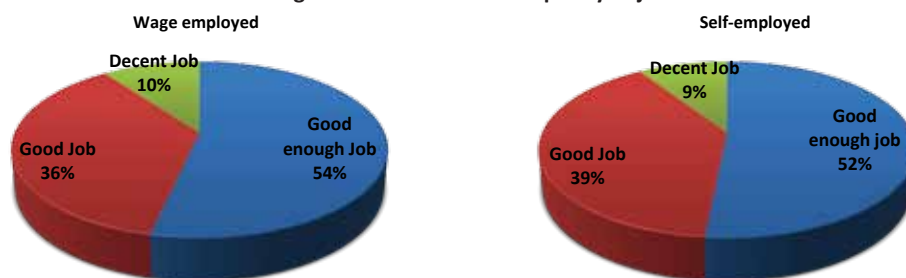
Employment categories and quality of job

Figure 9.1 suggests that, in 2010 in the case of wage employed, while the decent job appeared to be only 10 percent, good job and good-enough job constituted 36 percent and 54 percent respectively. For self-employed, decent job comprised of 9 percent, while good job and good-enough job constituted 39 percent and 52 percent respectively.

Figure 9.2 shows that the proportion of decent job is the highest among the regular paid employee constituting 27.1 percent of total regular paid employees. The significance of good job is also the highest for this employment category. However, in all other cases, more than three-fourth of employment is good-enough, whereas the proportion on decent job is very insignificant.

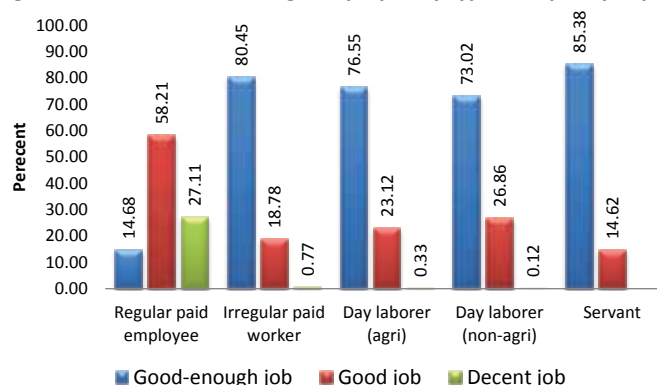
¹ For details on MICE please see Schafer (1999), Royston (2009), Royston and White (2011), Marchenko (2011), Azur, et. Al. (2011) and Bouhlila and Sellaouti (2013).

Figure 9.1: Distribution of quality of job



Source: Authors' calculation from the LFS, 2010

Figure 9.2: Distribution of wage employed by type and quality of job



Source: Authors' calculation from the LFS, 2010

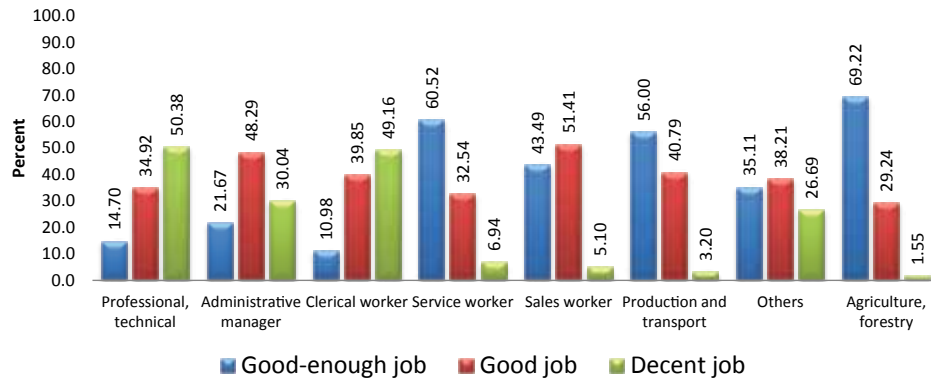
As shown in Figure 9.3, in the case of self-employment, around 20 percent of the employers appear to be with decent jobs, whereas decent job is less than 10 percent in both agricultural and non-agricultural self-employment. More than 50 percent of the jobs in the employer category are good jobs, whereas around 50 percent of the jobs in both agricultural and non-agricultural self-employment categories are good-enough.

Figure 9.3: Distribution of self-employed by type and quality of job



Source: Authors' calculation from the LFS, 2010

Figure 9.4: Distribution of wage-employed by job quality and source of employment

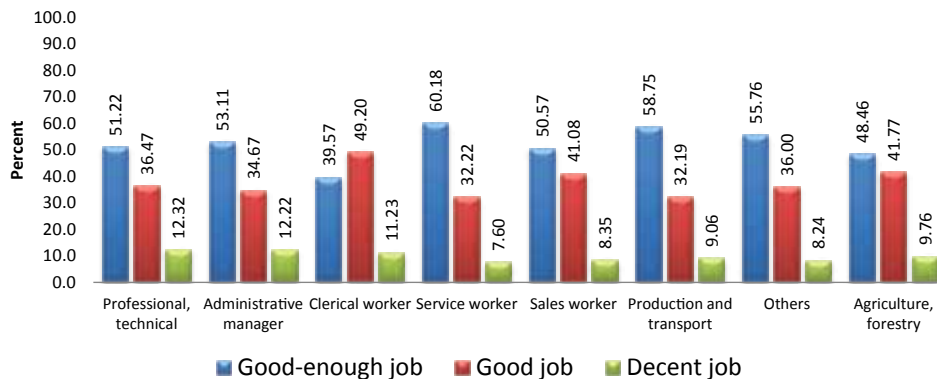


Source: Authors' calculation from the LFS, 2010

Figure 9.4 and Figure 9.5 show the proportion of job qualities among various occupations wage-employed and self-employed respectively. For the wage employed (Figure 9.4), the highest share of decent job is being generated in the 'professional, technical' occupation as 50.4 percent of total wage-employed in 'professional, technical' are in decent jobs. The share of decent job is also high among 'administrative manager' (30 percent) and 'clerical workers' (49.2 percent). Share of 'good' job is also high for these categories. The figure thus points out that, the professions those tend to be higher productive by nature are more likely to have greater shares of decent job. In contrast, wage labor in service work, sales work, production and transport work and agriculture are pre-dominantly good-enough with very small share of decent job.

However, for the self-employed category, as shown in Figure 9.5 we do not see such variations in job quality. Among the clerical workers and professional - technical workers, the share of good job comprises of 49.2 percent and 36.5 percent respectively. Although not as high as the wage employed category, decent job accounts for the highest percentage in the professional-technical, administrative manager and clerical worker occupational categories. Although weak, it resembles the link between productivity and the quality of jobs.

Figure 9.5: Distribution of self-employed by job quality and source of employment



Source: Authors' calculation from the LFS, 2010

Age distribution and quality of job

Table 9.1 shows that for the wage employed, more than 50 percent of the good-enough job as well as good job are mostly concentrated among the age groups between 15 and 34. In contrast, more than 50 percent of the decent job is concentrated among the age group between 25 and 44.

Table 9.1: Age distribution and quality of job for wage employed

Age category	Good-enough Job	Good Job	Decent Job
15-24	27.7	24.4	9.6
25-34	26.6	31.1	28.0
35-44	21.7	23.2	26.2
45-54	12.9	12.7	26.8
55-64	7.5	6.0	8.1
65+	3.8	2.6	1.3
Total	100	100	100

Source: Authors' calculation from the LFS, 2010

On the contrary, Table 9.2 shows that, when considering self-employed, more than 58 percent comes from the age groups between 25 and 44 in the case of 'good-enough' job. In the cases of 'good' job and 'decent' job, more than 50 percent is comprised of the age groups between 35 and 44. A sharp contrast between Table 9.1 and Table 9.2 is related to the share of youth employment in total 'good-enough' job or 'good' job: while youth employment (for the wage-employed category) in total 'good-enough' job or 'good' job comprises of more than 24 percent, in case of self-employed this share is less than 10 percent.

Table 9.2: Age distribution and quality of job for self-employed

Age category	Good-enough Job	Good Job	Decent Job
15-24	9.8	6.5	9.5
25-34	23.1	21.3	19.5
35-44	35.1	26.1	26.0
45-54	20.3	24.0	23.3
55-64	7.8	13.8	13.2
65+	3.9	8.4	8.4
Total	100	100	100

Source: Authors' calculation from the LFS, 2010

To see the distribution of age and quality of job from a different perspective, we intend to look at the quality of job with respect to segregated age group. Table 9.3 shows that, most of the youth employment is concentrated in good-enough job (about 60.1 percent). It is also evident from Table 9.3 that, employment in decent job steadily rises from only 3.9 percent for the age group of 15–24 to 19.1 percent for the age-group of 45–54. Thereafter, the share of decent job among the later two age-groups continues to fall again. A similar pattern is noticed (in Table 9.4) when observing the youth-employment profile of the self-employed category apart from the fact that, we do not observe any kind of trend between decent job and age distribution like we have seen in the case of wage-employed.

Table 9.3: Age distribution and quality of job for wage employed

Age category	Good-enough job	Good job	Decent job	Total
15-24	60.09	36.00	3.92	100
25-34	50.11	39.92	9.97	100
35-44	51.10	37.21	11.69	100
45-54	48.50	32.46	19.05	100
55-64	57.12	31.24	11.64	100
65+	64.96	30.89	4.15	100

Source: Authors' calculation from the LFS, 2010

Table 9.4: Age distribution and quality of job for self-employed

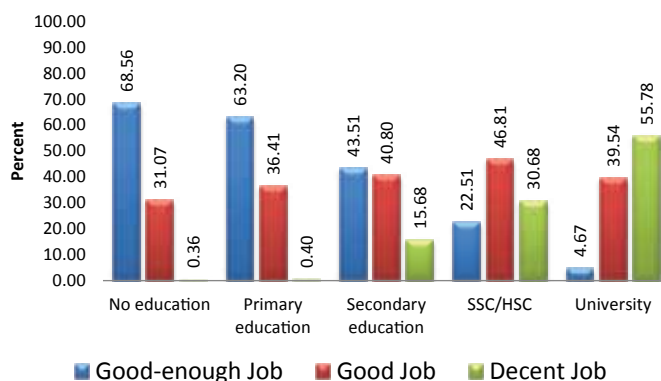
Age category	Good-enough job	Good job	Decent job	Total
15-24	59.64	30.02	10.33	100
25-34	53.93	37.89	8.18	100
35-44	58.90	33.29	7.81	100
45-54	47.51	42.71	9.78	100
55-64	37.78	50.72	11.50	100
65+	33.37	53.85	12.77	100

Source: Authors' calculation from the LFS, 2010

Education and quality of job

The strong relationship between education and quality of job can be depicted from Figure 9.6 (for the wage-employed) and Figure 9.7 (for the self-employed). In the case of wage employed, workers with no-education or primary education are mostly prevailing in the 'good-enough' job (comprising more than 60 percent). On the contrary, workers with secondary or higher than secondary education are mostly engaged in the 'good' job or 'decent' job (comprising more than 50 percent). For example, while 30.7 percent of the workers with SSC/HSC education availed 'decent' job, 55.8 percent of the workers with university education got employed in 'decent' job.

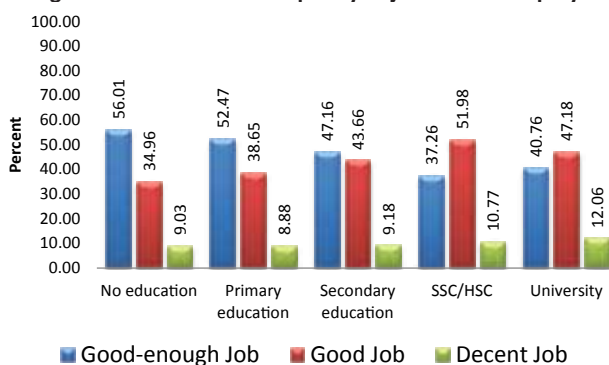
Figure 9.6: Education and quality of job for wage employed



Source: Authors' calculation from the LFS, 2010

In case of self-employed (Figure 9.7), persons with education equivalent to secondary education or lower are concentrated in good-enough jobs while persons with SSC/HSC or higher level of education are primarily concentrated in good-jobs. A contrasting feature of Figure 9.7 with respect to Figure 9.6 is that, while, in the case of wage employed, we found the large pool of university graduates are employed in the 'decent' job, we see only 12 percent of the university graduates engaged in 'decent' self-employment. In concurrence, about 47 percent of the university graduates are found to be self-employed in the 'good' job.

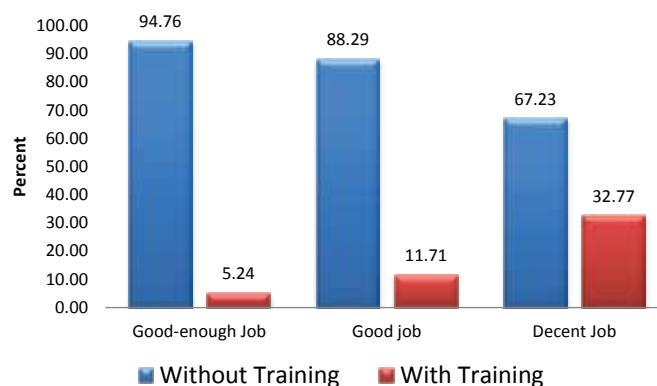
Figure 9.7: Education and quality of job for self-employed



Source: Authors' calculation from the LFS, 2010

Training and quality of job

Figure 9.8 shows that, for the wage employed, while only 5.2 percent of the persons in good-enough job received training, the rate is 11.7 percent and 32.8 percent for persons in good job and decent job respectively. In contrast, Figure 9.9 shows that, the percent of people received training in case of self-employment is about only 5 percent which remains invariably same for all three job qualities.

Figure 9.8: Training and quality of job for wage employed

Source: Authors' calculation from the LFS, 2010

Figure 9.9: Training and quality of job for self-employed

Source: Authors' calculation from the LFS, 2010

How do Education and Skill Matter for a Better Job? Insights from Econometric Exercises

In order to see the impacts of education and training over the quality of employment we have run two separate multinomial logistic regressions: one, considering only the wage-employed category, and the other considering only the self-employed category. In both of the cases, our base category is good-enough job.

In case of the first set of regressions where we considered only the wage employed, we find that education and training have highly significant impact on moving from good-enough job to good job and decent job (Table 9.5). The results from average marginal effect reported in Table 9.5 suggest that, though, primary education is found to be insignificant in changing the quality of job, persons with secondary and higher secondary education have almost 20 percentage points higher probability to be in a decent job compared to persons with no-education. The impact of education is found to be the highest for university education, as being educated in a university increases the probability to be in a good job by 18 percentage points while it increases the probability to be in a decent job by 26 percentage points compared to the persons with no-education. Moreover, education of the household head has a statistically significant and positive trans-generational impact if the household head has more than primary education. Household heads with secondary or higher secondary education increases the probability of a worker to be in a good job by more than 5 percentage points and to be in a decent job by around 3 percentage points compared to the household heads with no education. The magnitude is the same in case of decent job if the household head possesses a university degree. The results also indicate that, training helps to move people up from good-enough job to good job or decent job. Compared to persons without training, a trained worker has more than 6 percentage points higher probability to be in a good job or a decent job.

Table 9.5 also suggests that there is a concave relationship between age and the probability of having good-job or decent job, i.e. the probability of having a better job increases at a decreasing rate with the increase in age. The gender dummy (female) shows that, females have 8.3 percent higher probability to be in good-enough job compared to the male category. The coefficients of family income further suggest that, with the rise in family income – the probability of a person to be in good-job or decent job increases significantly. Although to a lesser extent, the implication of per capita household land is analogous to the impact of family income.

Table 9.5: Average marginal effects (for wage employed category)

Explanatory variables	Marginal effects for good-enough job (category 1)	Marginal effects for good job (category 2)	Marginal effects for decent job (category 3)
Primary education	0.005 (0.010)	0.020 (0.014)	-0.025 (0.016)
Secondary education	-0.079*** (0.011)	-0.110*** (0.012)	0.191*** (0.009)
SSC/ HSC	-0.160*** (0.011)	-0.032** (0.013)	0.193*** (0.009)
University education	-0.433*** (0.033)	0.174*** (0.032)	0.258*** (0.011)
Age	-0.020*** (0.001)	0.011*** (0.001)	0.0094*** (0.001)
Age squared	0.0002*** (0.000)	-0.0001*** (0.000)	-0.0001*** (0.000)
Family income	-0.219*** (0.003)	0.185*** (0.004)	0.034*** (0.002)
Female dummy	0.083*** (0.007)	-0.117*** (0.008)	0.033*** (0.004)
Training dummy	-0.066*** (0.010)	0.034*** (0.010)	0.032*** (0.003)
Household head with primary education	-0.023** (0.009)	0.023** (0.010)	0.0001 (0.008)
Household head with secondary education	-0.082*** (0.011)	0.054*** (0.012)	0.028*** (0.006)
Household head with SSC/HSC	-0.091*** (0.012)	0.064*** (0.013)	0.027*** (0.006)
Household head with university education	-0.028 (0.031)	-0.003 (0.029)	0.031*** (0.008)
Land holding	-0.0004*** (0.000)	0.0002* (0.0001)	0.0002*** (0.000)

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

To understand how and to what extent education and training shift the quality of job we have also calculated the relative risk ratio (RRR) of the corresponding variables for each category compared to the base category (Table 9.6). We find that, RRR is significant for all other levels of education except primary education. For a person with secondary education relative to no education, the relative risk (RR) for decent job compared to good-enough job would be expected to increase by a factor of 23.2. The RR for decent job relative to good-enough job would increase by a factor of 32.7 and 241.1 for attainment of higher secondary and university education respectively compared to the no education category holding all other things constant. These results indicate the strong capability of higher education in lifting up the quality of employment generation as opposed to no education. Although small in magnitude, training does have a highly significant impact. For persons with training in comparison to persons without training, the relative risk for having a decent job compared to good-enough job would increase by a factor of 2.1 holding all other variables constant.

Table 9.6: The result of multinomial logit regression in case of wage employment (in terms of RRR)

Explanatory variables	Category (base category : Good-enough job)	
	Category 2 (Good job)	Category 3 (Decent job)
Primary education	1.016 (0.052)	0.667 (0.174)
Secondary education	1.105 (0.067)	23.245*** (3.628)
SSC/ HSC	1.722*** (0.113)	32.701*** (5.229)
University education	6.959*** (1.278)	241.06*** (57.132)
Age	1.100*** (0.006)	1.241*** (0.016)
Age squared	0.998*** (0.0001)	0.997*** (0.0001)
Family income	3.182*** (0.078)	3.791*** (0.162)
Female dummy	0.592*** (0.026)	1.204** (0.092)
Training dummy	1.364*** (0.075)	2.076*** (0.149)
Household head with primary education	1.138*** (0.057)	1.093 (0.147)
Household head with secondary education	1.501*** (0.097)	2.078*** (0.236)
Household head with SSC/HSC	1.580*** (0.109)	2.128*** (0.247)
Household head with university education	1.105 (0.187)	1.788*** (0.353)
Land holding	1.001*** (0.001)	1.004*** (0.001)
Constant	.00001*** (3.11e-06)	2.71e-09*** (1.27e-09)
Number of observations	26417	
LR chi2(28)	11373.92	
Prob > chi2	0.0000	
Pseudo R2	0.2305	

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Table 9.7: Average marginal effects (for self-employed category)

Explanatory variables	Marginal effects for good-enough job (category 1)	Marginal effects for good job (category 2)	Marginal effects for decent job (category 3)
Primary education	-0.012* (0.006)	0.02** (0.006)	-0.008* (0.004)
Secondary education	-0.028*** (0.008)	0.038*** (0.008)	-0.01* (0.005)
SSC/ HSC	-0.065*** (0.008)	0.070*** (0.008)	-0.0053 (0.005)
University education	-0.002 (0.018)	0.002 (0.018)	0.0002 (0.010)
Age	-0.006*** (0.001)	0.007*** (0.001)	-0.0011* (0.001)
Age squared	0.00003** (0.00001)	-0.0001*** (0.000)	0.0000** (0.000)
Family income	-0.136*** (0.004)	0.112*** (0.004)	0.0240*** (0.002)
Female dummy	0.496*** (0.007)	-0.393*** (0.009)	-0.1038*** (0.007)
Training dummy	0.0003 (0.012)	-0.001 (0.012)	0.001 (0.007)
Land holding	-0.0007*** (0.000)	0.001*** (0.000)	0.0001*** (0.000)

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

In the second regression, reported in Table 9.7, we have considered the self-employed category while our base category remains the same ('good-enough' job). However, in this case, we have dropped variables related to household head, as self-employed persons are pre-dominantly household heads (about 72 percent). Average marginal effects, reported in Table 9.7, show that level of education has statistically significant impact over moving from good-enough job to good job or decent job. While persons with primary education have around 2 percentage points higher probability to be in good-job compared to the no-education category, it has almost negligible but negative influence over the probability of attaining decent job. Persons with secondary or higher secondary education have more than 4 percentage points higher probability of having a good job compared to no-education category. The data suggests no significant impact of university education over the attainment of good job or decent job. Moreover, impacts of training are also found to be insignificant in cases of such transitions. A possible explanation of the insignificance of these major variables could be that, only a very low percentage of people in the self-employed category participated in any training program (only about 4 percent) or had university degree (2.24 percent) in the LFS 2010 data. This finding stylizes nothing but the fact that, the majority of the self-employed sector comprises of unskilled labor who lack higher education and/or proper trainings.

Table 9.7 also suggests that, compared to males, females have 39 percentage points and 10 percentage points lower probability to be in the good job and decent job respectively. Just like the previous case, in case of self-employment we find a highly significant influence of family income over the probability of availing a good job or decent job. Per-capita land holding has also a significant effect over the quality of employment that a person may avail. Combined, these two show that, the socio-economic context of a household may play an important role in assuring better quality employment to its members. Hence, skill development programs may have a multiplier effect through the spillover benefits accrued to its members.

In terms of RRR, reported in Table 9.8, we find that, having primary education compared to no-education improves the Relative Risk (RR) to be in good job compared to good-enough job. However, it doesn't have any significance with respect to decent job. On top of that, having secondary or higher secondary education compared to no education increases the RR for good job compared to good-enough job by more than a factor of 1.2. However, impacts of university education and training were found to be insignificant in case of RRR.

Table 9.8: The result of multinomial logit regression in case of self-employment (in terms of RRR)

Explanatory variables	Category (base category : Good-enough job)	
	Category 2 (Good job)	Category 3 (Decent job)
Primary education	1.089** (0.037)	0.950 (0.052)
Secondary education	1.192*** (0.053)	0.974 (0.070)
SSC/ HSC	1.435*** (0.059)	1.128* (0.073)
University education	1.010 (0.096)	1.007 (0.141)
Age	1.037*** (0.005)	1.005 (0.008)
Age squared	0.999*** (0.000)	1.000 (0.000)
Family income	1.947*** (0.043)	1.886*** (0.064)
Female dummy	0.0921*** (0.004)	0.083*** (0.007)
Training dummy	0.996 (0.065)	1.008 (0.103)
Land holding	1.003*** (0.000)	1.003*** (0.000)
Constant	0.002*** (0.000)	0.001*** (0.000)
Number of observations	29196	
LR chi2(20)	5576.89	
Prob > chi2	0.0000	
Pseudo R2	0.1028	

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are the standard errors.

Conclusion

There is no denying the fact that the world of today is equally concerned, if not more, with the quality of employment rather than improvement in numbers. The dominant paradigm in the discussion on quality of employment focuses on the improvements at the demand side of labor, i.e. issues related to the working condition. In this paper, we have suggested that, although if we initiate improvements at the demand side, there could be a supply side mismatch intermitting the overall effectiveness of the demand side policies. From the analysis part of the paper, we see that, education and training have highly significant impacts over the quality of employment that a person may avail. The transition takes place in the form of productivity enhancement. The importance of the productivity enhancement is that, even if we can generate terms and conditions for employing 'decent work' agenda in practice, the workers may themselves lack the quality to be absorbed in the transformation process due to their lower productivity. Productivity enhancement will not only create 'decent job' benefits to the households at the individual level but will also accelerate the process of transformation at the social level.

Hence, supply side policies like spreading education and skill development programs to the mass population, removing socio-economic barriers those have converse impacts over education attainment, and enhancing the diversity of training programs taking into consideration of the domestic as well as global labor market demands should be adapted. Most importantly, to ensure the proper escalation of labor productivity – emphasis must be put on the improvement of the quality of education and training as well. A prompt response from the government incorporating various development agencies and international donors will fasten the process of recognition of the problems, identification of the strategies and implementation of the policies.

Does Participation in Vocational Training Differ on Agricultural Seasonality?

Israt Jahan and Abu S. Shonchoy

Introduction

Skilled workforce is the fundamental requirement for the growth and development of an economy. Hence, training programs are considered to be a potential solution to address the problem of lack of a skilled workforce. For a country like Bangladesh, skill development programs are of top policy importance; and adequately planning for such programs are crucial policy concerns. The country is currently enjoying the youth bulge or popularly known as demographic dividend – a large youth workforce (especially workforce aged 15 to 24) compared to its dependent population. The age dependency ratio (percentage of working-age population) of Bangladesh is higher than Sri Lanka, India and Bhutan in South Asia.

However, the 2010 Labour Force Survey (LFS) of Bangladesh noted a worrisome fact that 39.22 percent of this workforce are uneducated. Given the education level and resulted lack of skill of this particular workforce, training programs need to emphasis more on the proper planning and targeting issue to address the demand and supply nexus of the skill-shortage, to make the youth labor contribute more to the development of the economy.

To address this immediate need of skill-shortage, many private sector interventions – along with public sector -- have been running various training programs. However, these training programs (even when offered free-of-cost) face a large attrition rate- many of those who sign-up, do not show-up for the actual training sessions. Various studies have pointed out issues like distance, lack of information, backwardness, social taboo, and lack of networking as important impediments for training program take-up rate. However, there is hardly any study to address the importance of the training program schedule with local agrarian seasonal patterns, which have important targeting issues for the implementing authorities. However, training programs – both public and private – do not typically pay attention to this seasonality and as a result suffer from issues like attrition, discontinuation, and dropout.

To address this important topic systematically, we focus on the northern part of Bangladesh where agriculture is the main source of earning. Distinct seasonal patterns exist in northern Bangladesh. In this study, using survey data on the sample selection for a training, we focus on the timing of the specific type of training to examine how seasonality makes a difference in participation. To the best of our knowledge, there exists no rigorous study to understand the seasonality impact on the sample selection of a training program. The study explains the socio-economic conditions of the interested candidates for the training program who are willing to participate based on the eligibility.

Literature Review

There are demands for skilled workers in different industries of Bangladesh. But the supply of such skilled workers is low. Maclean, Jagannathan and Sarvi (2013), on their study, explained the importance and need for technical and vocational education and training to meet this huge labour demand. Maclean *et al* (2013) noticed the employment dependence on agricultural work in the South Asian region which they argued to minimize by the technical and targeted education and training. Rahman and Islam (2013) also emphasized on women's education and skill training for economic development.

While Bangladesh is having a consistent growth over the economy, certain regions still lag behind in terms of economic opportunities and development. Different studies have discussed about seasonal unemployment and

its remedy. In Bangladesh, seasonality is a very common phenomena as it is mostly based on agriculture. During the seasonal famine, 50 to 60 percent of the income falls for the individuals affected by this seasonality (Mobarak *et al.* 2011).

A particular problem concerns the pre-harvest 'lean' seasons that are more prevalent in the agriculture based economies such as countries in South Asia and Sub-Saharan Africa. This period of annual famine, known as 'Monga' in Bangladesh (Shonchoy and Kurosaki, 2014). Government, NGOs and other private organizations provide different programs to accommodate this seasonal impact. Food/cash for work, microcredit, and giving trainings are common among the interventions for consumption-smoothing (Mobarak *et al.* 2011).

Diverse training programs have heterogeneous impact on employment and earnings. Attanasio *et al.* (2011) (Colombia) and Hicks *et al.* (2011) (Kenya) have found greater impact on females' well-being than that of male one's. Despite providing the evidence of the impact of training, this study focuses on how training programs should address seasonality and the agriculturally important time period to pave a long term pathway to employment and development.

Jahan (2016) has provided the reasoning on how training programs should be designed on the perspective of age, gender, educational and occupational categories. She discussed what type of people can generate higher incentives from different types of training. Hence, this study bridges the gap in the policy suggestion of a proper and scientific analysis of the seasonality on training programs.

Background of the Program

The particular program that we evaluate in this project does a targeted intervention. It is a skill training program for RMG sector operated by Gana Unnayan Kendra (GUK) a local NGO working at Gaibandha, a vulnerable district of northern Bangladesh. In this program, GUK provides skill training to interested young women and men of extreme poor families on woven garments. Initially GUK provided one month long residential training on sewing machine operation for the selected candidates from their targeted beneficiary households. The project officially started in July 2013. Gaibandha district was selected for several reasons. Agricultural activities are the main source of income in this region and most of the population of Gaibandha lives a vulnerable life with poverty. Mostly Aman and Boro paddies are cultivated in this area and during the months of April, July, September, October and November the availability of agricultural work is very limited.

This short survey was done as a part of a bigger impact evaluation project -- using Randomized Controlled Trial (RCT) method -- to understand which component of the training package is useful to induce employment for rural unskilled people. The particular program that we evaluate is a skill training program for RMG sector operated by Gana Unnayan Kendra (GUK), a local NGO working at the Gaibandha, a vulnerable district of northern Bangladesh. In this program, GUK provides skill training to interested young women and men of extreme poor families on woven garments. The initial program that our counterpart organization GUK provided, was a residential training program with a stipend and months long internship (on-the-job-training) at a garment factory located in Dhaka. In the RCT study -- funded by DFID and IZA-GLM -- we unbundled these components and evaluate which of these components has significant impact on securing a job at a factory. This short survey was done as a part of the initial sample selection process to recruit eligible participants for the program. Once we completed this survey (a total of 4123 interested candidates who applied), our research team verified the data based on physical household inspection and eligibility and found 2215 candidates to be eligible for the training program. We later did a detailed base-line survey on all the eligible households and did the randomization based on 2215 eligible candidates. This chapter analyses the data acquired for the short survey -- as a pre-assessment of the proposed RCT study -- which was generously funded by IDRC.

To understand the demand for such a training program, we conducted a survey to document the socio-economic condition of the participants based on eligibility. Table 10.1 provides the detailed eligibility criterion.

The program aims at training 1600 participants for the RMG sector, however, due to the capacity constraint program authority could not run this program in one go. As a result, we had to divide the program into different

quarters (we termed these quarters as “blocks”) and continue to hire interested individuals for the training program at different times of the year. We divide all the targeted population into 4 blocks. Our target was to select eligible candidates from moderate and ultra-poor households. In this survey we asked interested candidates about their age, land-holding, household living standards and education, occupation and employment related information. Other information includes household amenities (tube-well or latrine), livestock, productive asset that generates income, type of house and income during the MONGA season have been taken into consideration to define the poverty criteria.

Table 10.1: Eligibility criterion

<u>Individual Level</u>	
1.	<i>Age:</i> within 18 to 35 year of age (verified by national ID card or Birth certificate).
2.	<i>Education:</i> At least can read and write (checked by signature test)
3.	<i>Employment:</i> Currently unemployed (In case of <u>women</u> who are not actively engaged in economic activity, <u>ignore this point</u>).
4.	<i>Marital status:</i> Any status is allowed. (However, in case of unmarried women: ask the parents if they are OK with her decision. In case of married women with children, ask her family or husband about the arrangement of her children in case she goes to Dhaka for a job).
5.	<i>Willingness:</i> Should be willing to learn additional skills to change his/her profession preferably for the garments industries mostly located in Dhaka.
<u>Family Level (only choose between these two groups)</u>	
1.	Individuals belonging to Ultra poor family if any of the following four matches,
	• Less than 50 decimals of land (including agricultural, homestead and fallow).
	• Does not have household amenities like tube-well or latrine.
	• Does not have any livestock
	• Does not have any productive asset at home that generates income
	• House is mostly built with straw and mud
	• Does not have any regular source of income and remain completely unemployed during the MONGA (September to December).
2.	Individuals belonging to Moderate poor family if any of the following four matches,
	• Less than 100 decimals of land (including agricultural, homestead and fallow).
	• Does own <u>only one</u> of the household amenities among tube-well or latrine.
	• Does have only one livestock (either own or Adhi).
	• Does have only one productive asset at home that generates income
	• Whole house is not made with corrugate iron (TIN), partial tin-made house is OK.
	• Does not have any limited source of income and remain partially unemployed during the MONGA (September to December).

For this study, we received a total of 4123 eligible candidates interested to participate in the training program. The survey was undertaken in four blocks as mentioned before. The number of survey participants and timing of the survey is given in the Table 10.2. Each of the blocks are implemented at different times of the year. Thus each block represents one particular time of the year which captures the local seasonality. The survey started in August 2013 for the first block. We surveyed 1099 samples for the first block. Survey started for the second block in November 2013 and ended in December of the same year. Surveys for the third and fourth block were done in March-April and June 2014 respectively. Table 10.2 illustrates the seasonality attached to each block.

Table 10.2: Details of the survey

Block	Samples	Survey Time	Season
1st Block	1,099	August - October '13	Planting time (Aman), Monga Time
2nd Block	1,492	November - December '13	Monga Time, Harvesting time (Aman)
3rd Block	744	March - April '14	Harvesting time (Boro),
4th Block	788	June '14	-

Source: Survey data.

The entire survey accumulates six Upazilas (sub-district) of Gaibandha district (Table 10.3). In these six Upazilas, there are 52 unions and 255 villages that were covered by the survey. From a total of 4123 samples, the highest share was found from Shundargonj Upazila with 1231 samples and the lowest share was from Sadullahpur with 367 samples.

Table 10.3: Distribution of total sample by Upazila

Upazila	Samples
Fulchari	776
Gobendagonj	548
Palashbari	471
Sadullahpur	367
Shaghata	730
Sundargonj	1,231
Total	4,123

Source: Survey data.

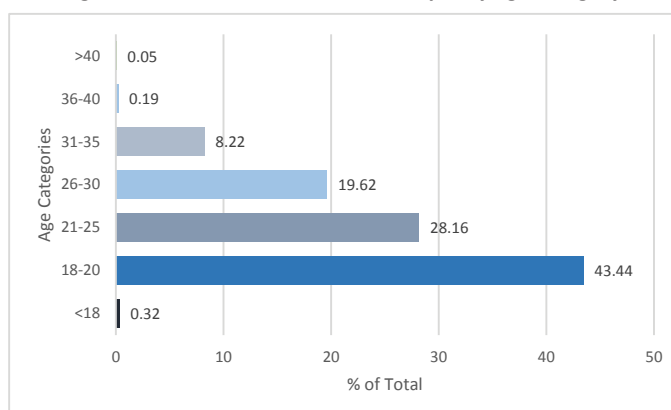
Socio-economic Condition of the Eligible Candidates

In this section, we analyze the distribution of the samples in different categories based on social economic characteristics. We have categorized the total sample into separate individualistic and household characteristics. Most of them were eligible for the interventions. Almost all are either “Ultra-Poor” or “moderate Poor”.

Individual characteristics of the candidates

The average age of the eligible candidates who applied for such a training program is 22.84. It appears that relatively younger youth population are more interested in such training programs. Age-specific categorization, as shown in Figure 10.1, suggests that the maximum percentage (43.44 percent) of the total sample is aged between 18 and 20. 28.16 percent were in the age category of 21-25 and 19.62 percent were in the age group of 26-30. A very small percentage of the total sample were aged over thirty. There were also some samples who were invalid under the eligibility criteria of age. Those who were below the required age or above; 0.32 percent were aged under 18, and 0.24 percent sample were over the age of 35.

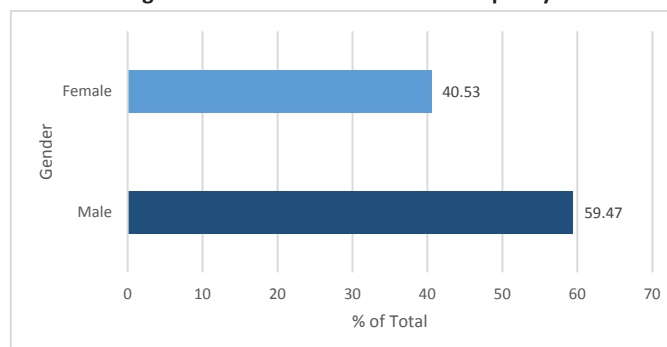
Figure 10.1: Distribution of total sample by age category



Source: Survey data.

Figure 10.2 shows the gender distribution of the sample. Males showed relatively considerable interest in such a training program (59.47%) compared with females (40.53%). Given the remoteness of the location and conservative nature as well as a patriarchal social system, this statistics is not surprising.

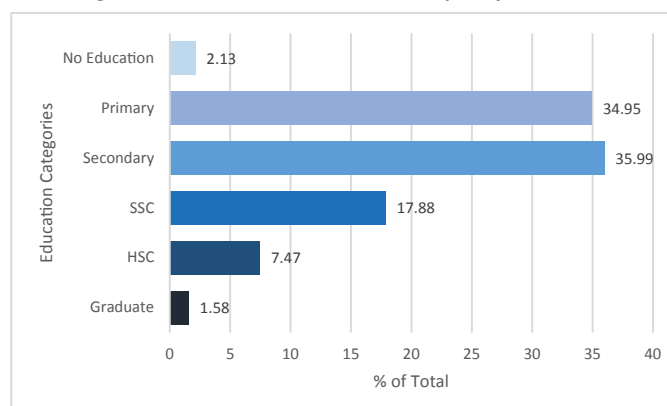
Figure 10.2: Distribution of total sample by sex



Source: Survey data.

The eligibility criteria for the training program was to have at least primary level of education (Figure 10.3). About 2.13 percent of total sample became ineligible for the program due to low educational qualifications. Those who were eligible, thirty five percent had primary education where another thirty six percent had secondary level schooling. The percentage of the sample having SSC and HSC are 17.88 and 7.47 percent, respectively. The portion of the sample having graduate level of study was very small, only 1.58 percent reported having such a qualification.

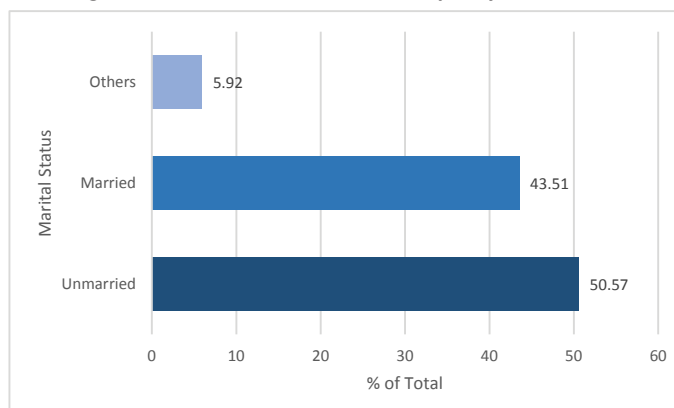
Figure 10.3: Distribution of total sample by education



Source: Survey data.

In case of marital status, in the total sample, about fifty percent of those who applied were unmarried (see Figure 10.4). About 43.51 percent reported being married during the time of application and the other 5.92 percent were either divorced, widowed or separated.

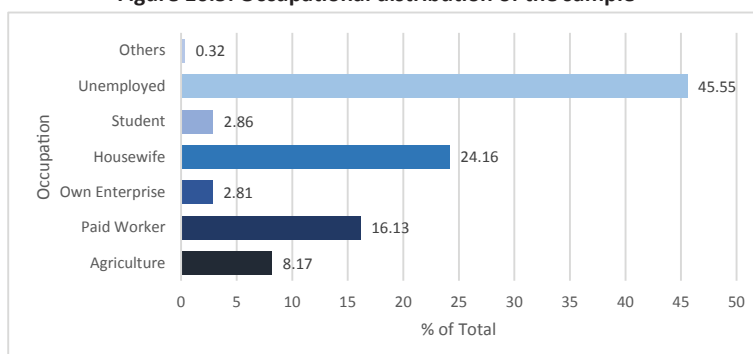
Figure 10.4: Distribution of total sample by marital status



Source: Survey data.

Figure 10.5 shows the occupational distribution of the candidates. As the diagram depicts, most applicants (45.55 percent) were unemployed during the time of the survey. 24.16 percent were housewives who reported being engaged in daily domestic household work or unpaid family work. Only a relatively small percentage of the sample (16.13 percent) mentioned being engaged in paid work and 8.17 percent were involved in agriculture. A very small percentage reported having a small enterprise and having entrepreneurial income.

Figure 10.5: Occupational distribution of the sample

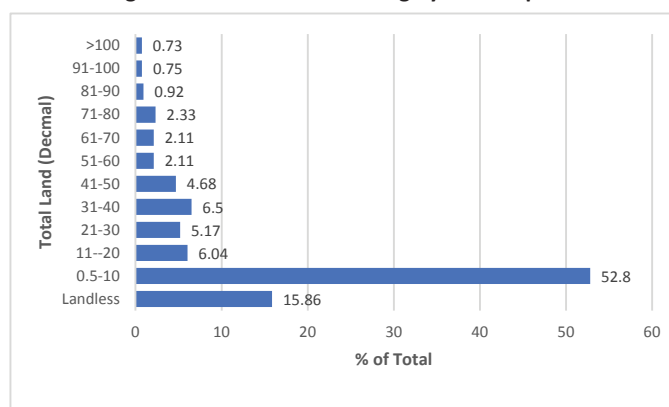


Source: Survey data.

Household characteristics of the applicants

Average household size of our sample was 5. About 34.97 percent households have no members aged below 12 and 97.67 percent households do not have any disabled member in the household.

Figure 10.6: Total land holding by the samples

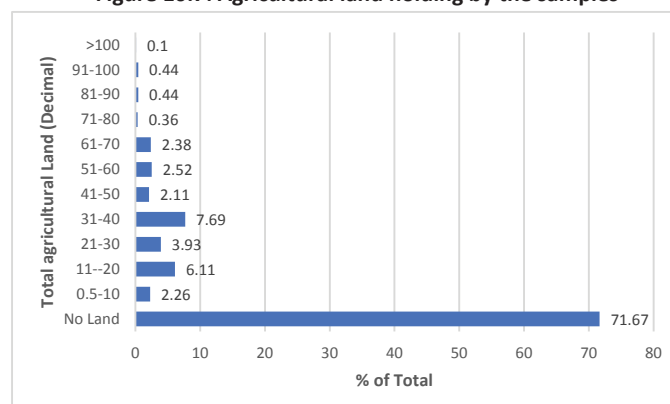


Source: Survey data.

As the study targeted the ultra-poor and moderate poor of Gaibandha, the land size was part of the eligibility criteria of the sample and an indicator of poverty. Having no land-holding (including agricultural, homestead and fallow) were considered to be ultra-poor and having less than 50 decimals of lands were considered to be moderately poor. In our survey, 15.86 percent of the sample didn't hold any land which shows the extent of poverty in that region (Figure 10.6). Maximum percentage (52.8 percent) was holding land within the range of 0.5 to 10 decimals. Figure 10.6 shows the distribution of the total sample in total land holdings.

The agricultural land holding by our sample was on an average very low. 71.67 percent of the total sample did not hold any type of agricultural land. Very small percentage of the sample had some agricultural land (Figure 10.7). Moreover 99.56 percent of the household did not have any productive asset like tractor, power tiller etc. also, the study found that 43.64 percent have their own livestock in their household where 6.43 percent have shared livestock (locally known as "adhi") in their household. Adhi is similar as share cropping contract but instead of crop one shares a livestock.

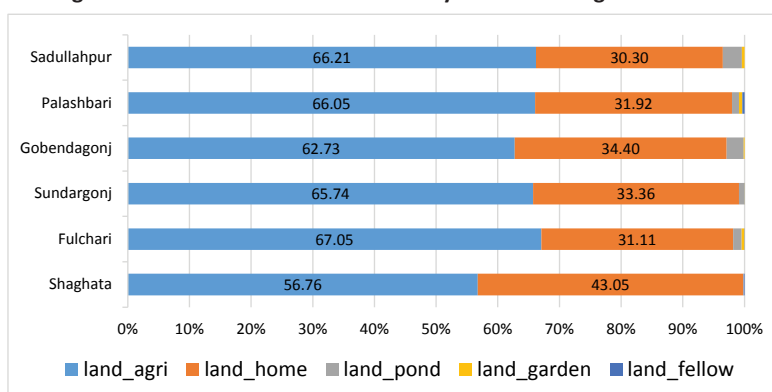
Figure 10.7: Agricultural land holding by the samples



Source: Survey data.

The distribution of total land holdings based on types of land at Upazila level is presented in Figure 10.8. A significant majority used their land for agriculture purpose, followed by land for resident. Interestingly this pattern is quite similar across six Upazilas showing consistency.

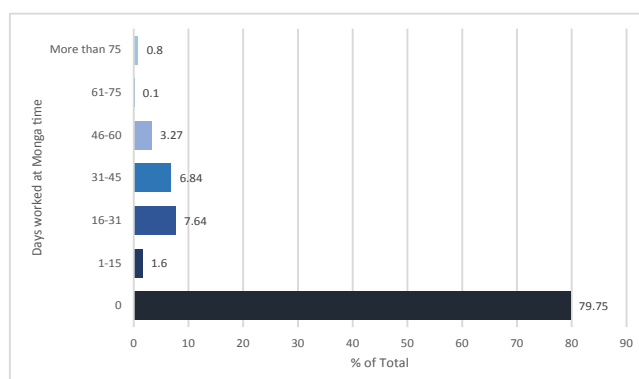
Figure 10.8: Distribution of total land by different categories of land



Source: Survey data.

Now, focusing our attention to seasonal deprivation or *Monga*, Figure 10.9 shows that 79.75 percent of our survey respondents reported not having any job or employment in the past *Monga* season (September to November). Those who worked in that season, the average number of days they had an employment is 35, which is about 28 percent of the time based on the total duration of the *monga* (Figure 10.9 below)

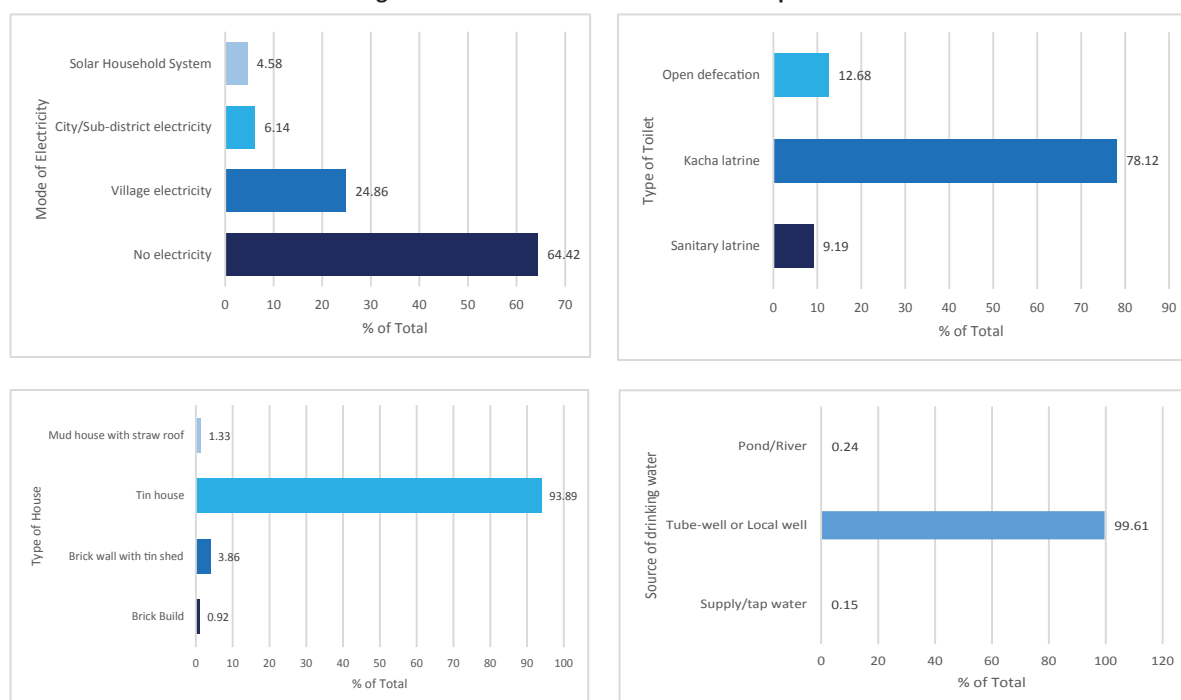
Figure 10.9: Days of employment during the last Monga season



Source: Survey data.

Figure 10.10 shows the percentage of samples having different types of utilities. 64.42 percent didn't get any electricity in their house. 24.86 percent survey respondents have village level electricity. Very smaller percentage of the sample had city district electricity or solar system. Moreover 78.12 percent of the samples had "kacha" latrine that is made of raw materials available locally. 93.89 percent of the samples mentioned living in a house that is made of tin (corrugated iron) and almost hundred percent of the sample uses tube well or local well to collect drinking water.

Figure 10.10: Utilities available to the samples



Source: Survey data.

Impact of Seasonality on the Sample Survey

Bangladesh is predominantly an agrarian economy and local agrarian seasonality is an important concern for many rural youth who have direct or indirect interaction with agriculture. Since agricultural day labourers remain unemployed during the off-harvesting and off-plantation period, it is very important for them to gain the maximum income during the peak labour demand season for the agriculture sector. The opportunity cost of participating and continuing a training program during the peak agricultural season is very high for poor rural youth. Hence, intuitively it is costly for them to take part in the training program if the training program coincides with the planting or harvesting season.

In order to see the impact of seasonality on interested training participants, we will now focus our discussion on socio-economic conditions based on the timing of the survey. In particular, we would like to see whether the socio-economic characteristics of the participants systematically vary if they are surveyed in a specific season, which is the main question of interest in this section.

In the northern area of Bangladesh, seasonality of lean season (*Monga*) is very pronounced when the agricultural day laborers are jobless between the plantation and harvesting time (see Khandker 2010). In Gaibandha, *Monga* time starts typically in September and continues until the end of November. The planting and harvesting time of the mostly grown paddy in northern Bangladesh is Aman and Boro, which are presented in the Table 10.4.

Table 10.4: Seasonality in the survey

Category of seasonality	Time
Job-less time: <i>Monga</i> time	September–November
Planting time (Aman)	July – August
Planting time (Boro)	January – February
Harvesting time (Aman)	November–December
Harvesting time (Boro)	April–May

Only 5.38 percent of the total sample were surveyed in *Monga* (Table 10.5). The percentage of people surveyed in planting time (Aman and Boro) and harvesting time (Aman and Boro) are 24.79, 32.69, 36.19 and 1.55 respectively. We see that the share of participants in the harvesting time of Boro is much less than the others. The categories are not mutually exclusive. So the total sum is not equal to 100 percent.

Table 10.5: Survey share based on seasonality

Survey Time	% of survey in the specific time
Monga time	5.38
Planting time (Aman)	24.79
Planting time (Boro)	32.69
Harvesting time (Aman)	36.19
Harvesting time (Boro)	1.55

To understand the systematic socio-economic pattern of the applicants, we categorized the seasonality into four groups- i) Normal Time with no seasonal impact (The month of March and June), ii) *Monga* Time, iii) Harvesting Time and vi) Planting Time. We have merged two plantation and two harvesting season into two groups. Then we created dummies for each group to note the significant difference on socio-economic situations of the eligible participants compared to that of normal time.

Table 10.6: T-test comparing seasonality

Category	Monga Vs Normal time		Harvesting Vs Normal time		Planting Vs Normal time	
	Difference	t-stat	Difference	t-stat	Difference	t-stat
Gender						
Female	-0.071	-2.089**	-0.065	-3.692***	-0.200	-10.247***
Age-Category						
Aged 18 to 20	0.202	5.650***	0.101	5.536***	0.200	10.139***
Aged 21 to 25	-0.070	-2.199**	-0.030	-1.831**	-0.039	-2.144**
Aged 26 to 30	-0.082	-2.999***	-0.016	-1.189	-0.109	-6.656***
Aged 31 to 35	-0.050	-2.931***	-0.055	-5.450***	-0.031	-3.074***
Education category						
Graduate	0.025	2.399**	0.021	4.977***	0.004	0.604
HSC Completed	0.088	4.281***	0.036	3.607***	0.043	3.866***
SSC complete	0.177	6.121***	0.117	8.575***	0.017	1.026
Secondary	-0.029	-0.813	0.028	1.607*	0.066	3.402***
Primary	-0.262	-8.126***	-0.203	-11.774***	-0.047	-2.620***
No education	0.000				-0.083	-11.311***
Marital Status						
Unmarried	0.247	7.064***	0.151	8.381***	0.209	10.586***
Married	-0.233	-6.858***	-0.144	-8.119***	-0.237	-12.181***
Others	-0.015	-0.835	-0.008	-0.832	0.027	3.072***
Occupation						
Agriculture	-0.118	-6.504***	-0.054	-5.395***	-0.024	-2.383**
Housewife	-0.120	-4.324***	-0.094	-6.271***	-0.154	-9.116***
Self-employed	-0.032	-3.347***	-0.021	-3.773***	-0.020	-3.436***
Paid-work	-0.030	-1.171	-0.021	-1.579*	-0.012	-0.796
Student	0.001	0.395	-0.003	-1.776*	-0.103	-12.705***
Unemployed	0.300	8.578***	0.194	10.780***	0.325	16.964***

Note: Difference= mean(0) - mean(1). Significance code: *** p<0.01, ** p<0.05, * p<0.1

We have conducted several independent group t-test to assess the differences. Here, in all cases, we considered the null hypothesis as, H_0 : Difference= mean(0) - mean(1) = 0. Here mean(0) is the average output of the normal type and mean(1) is the average output in the concerned season. The positive difference shows the higher weight on the average on the normal type, and the negative value of the difference shows the otherwise. The results are reported in Table 10.6.

We see that, for female category the differences are all negative. That means that females also get affected with seasonality compared to the normal time, which shows that seasonality is an important concern for females as well.

Now, comparing different age categories we see that within the age range of 21-35, all the differences are negative and significantly different from zero. As we know, a large share (56 percent, see Figure 10.1) of applicants came from the age range of 20-35, hence our results suggest that if one runs the training program during the period of seasonality, we will plausibly attract a different population. If programs want to target improving the family welfare and poverty status, and targets 20-35 age groups, then they must consider the local agricultural patterns, especially seasonality. In Table 10.6, we see that younger age-range – those who are in the age bracket of 18-20 – who are most likely financially dependent and unemployed, uptake the program systematically more during the time of seasonality.

We found that, people with more than ten years of education (SSC, HSC or Graduate) are more prevalent in participating in training during the time of seasonality. It demonstrates that those who are more educated than average population, are more interested in taking this training opportunity and would like to enroll more in the period of seasonality as they are less connected with agricultural sector. On the contrary, low educated people, who are mostly involved in agrarian sector, will be less likely to join during the period of agricultural seasonality. In our sample, a large portion of poor people are from this category, about 34 percent of the entire sample.

Occupation-wise analysis is also consistent with our earlier findings. Interestingly, other than agricultural professional, self-employed professional have also been affected by seasonality and are unlikely to enroll in the training program, for reasons described above. Unmarried persons are found to be participating more in the period of seasonality, while married people are less prevalent to participate in the time or *Monga*, harvesting or planting time. Married people have more family responsibilities hence income based pull-factors are more important, hence their opportunity cost of attending a training during the period of seasonality is very high. In our sample married people consist of 43 percent of the sample.

Conclusion

This study sheds light on the critical issue of targeting and local agricultural seasonality for typical skill development training program. We see that organizations those run programs for a target population (say ultra-poor) need to be careful about designing the program schedule and timing according to the local seasonality. Otherwise such a program will not be able to achieve the targeted beneficiaries. We see that ultra-poor are the ones who are generally illiterate, low-skilled, asset-less and typically work as day-laborers. However, opportunity cost of attending training of this target group during the local agricultural seasonality is very high, as they need to maximize the local opportunity to earn which they can use for consumption smoothing during the period of the lean season. Our analysis shows that the socio-economic attributes of applicants systematically vary during the period of seasonality than normal time. Hence, understanding seasonality and adequately addressing this into the design of the program is warranted to achieve a target population. Otherwise programs will face issues like mis-targeting, attrition and drop-outs.

How does Remittance affect Labor Force Participation Behavior and Employment Choice in Bangladesh?

Selim Raihan, Muhammad Moshir Rahman, Andilip Afroze and Mahtab Uddin

Introduction

In Bangladesh, remittance plays an important role in terms of its contribution to the gross national income and foreign exchange earnings, as well as its significant positive impact in reducing poverty both in the rural and urban areas (Raihan et al, 2014; Raihan and Sugiyarto, 2012; Raihan and Uddin, 2011; Raihan et al, 2009; Khondker and Raihan, 2009). Bangladesh is a major exporter of labor, and remittance is the second highest foreign exchange earning sector in this country. Not only international remittance, domestic remittance too has its own contribution to national income. In 2014, personal remittances received (which includes both domestic and international remittance) as a percentage of GDP was 8.7 percent (World Bank, 2016). Though remittance is an asset for the country and it can further be transmitted to the development of the socio-economic infrastructures of the country, members from the remittance-recipient households can have a disparate preference towards labor market participation decisions compared to the non-recipient households. Hence, remittance could be one of the major drivers behind the labor market dynamics in Bangladesh. Against this backdrop, this paper examines the influence of remittances (both international and internal) over the labor market participation behavior of the recipients in agricultural and non-agricultural sectors of Bangladesh. In this study we have used the Household Income and Expenditure Survey (HIES) 2010 data for our analysis and relevant econometric exercises, as HIES 2010 is the latest available nation-wide household level data that has a separate section on household migration and remittance information.

Literature Review

In the literature of migration and remittances, there is no consensus among scholars regarding the impacts of migration and remittances on labor market participation. The disputed conclusion on the impacts of remittances arises from the fact that, this impact varies with gender, nature of remittance and sometimes on the methodologies being applied. *Ndiaye et al.* (2015) analyzed the impact of migration and remittance on labor market participation in Senegal and found significant decline in labor market participation of household members with migrants due to remittance. The study also identified less incentive for the remaining household members to create their own businesses. Acosta (2006) and Görlich *et al.* (2007), in the contexts of El Salvador and Moldova respectively, found gender specific implication of remittances over the employment status: although, on average, adult male labor force participation as well as activity choice remained unaffected, labor force participation of adult female decreased in the remittance receiving households. Funkhouser (1992) found a similar result on female labor force participation in Nicaragua. However, unlike the previous studies, he found a significant positive impact on males' entrepreneurial activities. In the contrary, Rodriguez and Tiongson (2001) concluded that, remittances reduced not only the labor force participation but also overall employment in Manila. Evidence of Albania by contrast, showed that, only salaried non-migrant employees substituted income for leisure once they received a substantial amount of remittance (Narazani, 2009). However, Jadotte (2009) found evidence in support of a declining labor supply with respect to increasing remittances in the Republic of Haiti. A similar result is drawn by Justino and Shemyakina (2012) where they evidenced an inverse relationship between hours of work and remittances for the remittance receiving households in conflict-prone area in Tajikistan. On the other hand, Schuman (2013) showed that, the impact of remittances could be considerably different based on the level of education or skill of the recipient. His findings, in the context of Senegal, showed that, highly educated men were more likely to be self-employed and less likely to be wage-employed if they received remittance, whereas, there was no evidence on the labor supply responses for the low educated individuals.

In the context of Cameroon, Epo and Baye (2013) found that remittances had a role over the remittance receiving households in investing more in farm sectors compared to nonfarm activities, and thus led to a switch in employment in favor of the farm sector. This is also supported by the study by De Hass (2006), which in the context of Southern Morocco found that, households, having a rise in remittance income, invested more in housing and agriculture. Böhme (2013) found a positive effect of international migration on the accumulation of agricultural assets in Mexico, suggesting use of capital obtained from international migration mainly for overcoming liquidity constraints for subsistence production.

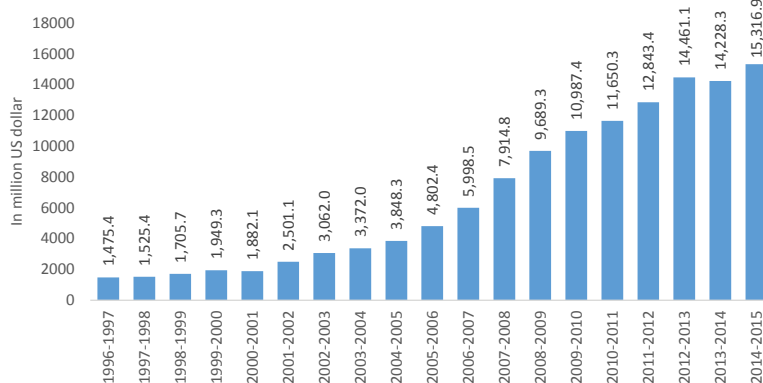
Therefore, the ongoing literature suffices the existence of a relationship between the remittance recipient households and its impacts over the labor market. However, the point of distinction in the literature is that, although the relationship is established, its direction is not. This is due to the fact that, countries differ in terms of socio-economic diversities, level of education, scope of entrepreneurial ventures, social and political commitment towards women empowerment.

Remittance and Labor Market: How do They Interact?

Trends and patterns of remittance flow

The flow of international remittance in Bangladesh rose from less than USD 2 billion in 2000 to more than USD 15 billion in 2015 (Figure 11.1). This has placed Bangladesh among the top 10 remittance-receiving countries in the World (World Bank, Migration and Remittances Factbook, 2016).

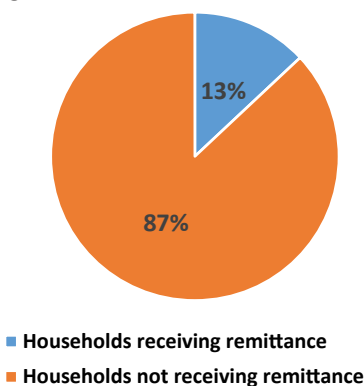
Figure 11.1: Remittance sent by expatriate Bangladeshis



Source: Bangladesh Bank

The distribution of households in terms of status of remittance receipt is shown in Figure 11.2. It is evident that, in 2010, about 13 percent of the households received remittances, either from home or abroad.

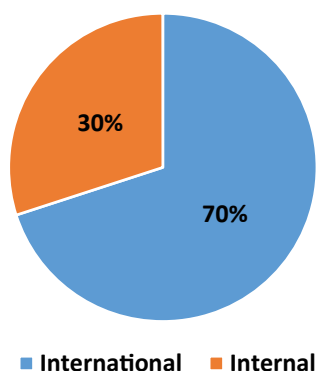
Figure 11.2: Remittance status of households



Source: HIES data, 2010

In accordance with Figure 11.2, Figure 11.3 shows the distribution of the remittance receiving households according to the types of remittances. About two third of the remittance receiving households received international remittance, while about 30 percent of the households received internal remittance. Thus, Figure 11.3 depicts the relative importance of international remittance over internal remittance.

Figure 11.3: Households by sources of remittance



Source: HIES data, 2010

Region and remittance status

To serve our objective, we have analyzed specific statistics of working age population considering individuals living in remittance receiving households as the remittance recipients. An important feature of remittances is that (Figure 11.4), individuals from recipient households were predominantly geographically concentrated in the rural areas (about 82 percent) while the other group was concentrated in the urban areas (about 70 percent).

Figure 11.4: Rural -urban scenario by remittance status

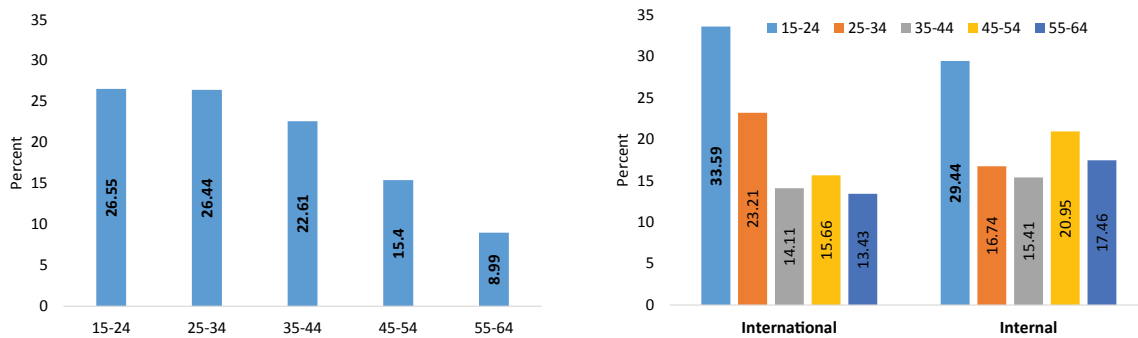


Source: HIES data, 2010

Age composition and remittance status

Figure 11.5 shows that, in the case of individuals belonging to households not receiving remittance, a major portion was from the younger age categories. International remittance also shows a similar pattern with a higher concentration among younger age categories. However, internal remittance shows slightly different pattern. Individuals from internal remittance receiving households were concentrated at both ends of age category; age groups between 25 and 44 had the lowest concentration.

Figure 11.5: Age distribution by remittance status and sources of remittance

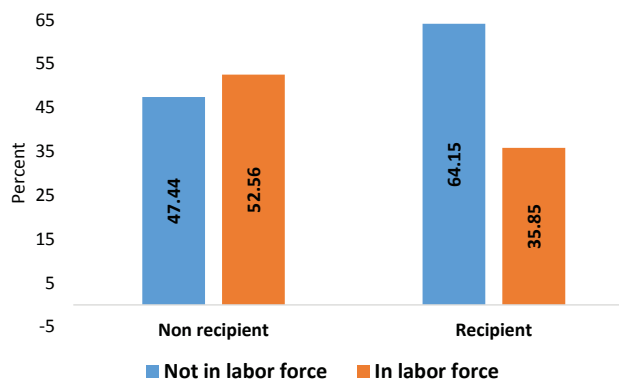


Source: HIES data, 2010

Labor force participation and employment type by remittance status

The Figure 11.6 represents labor force participation of the individuals from recipient households compared to non-recipient households. It is apparent that the labor force participation of the individuals from the remittance-receiving households was significantly lower than those from the non-remittance receiving households in 2010. This drop in labor force participation can be explained as a resultant of income effect due to the inflow of remittance income that exceeds the out-migration effect of remittance receiving households (Amuedo-Dorantes, Catalina and Pozo, 2006).

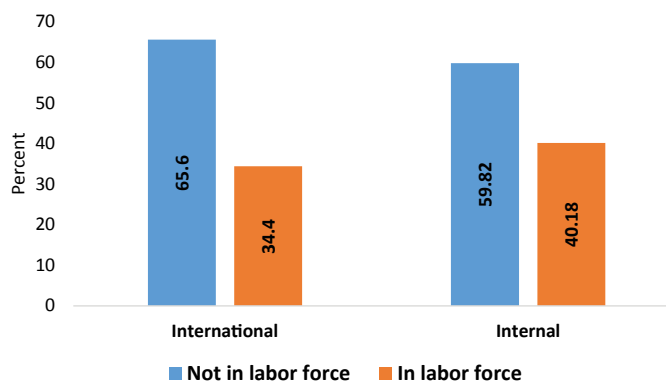
Figure 11.6: Participation in the labor force by remittance status



Source: HIES data, 2010

In Figure 11.7, a similar comparison is made between international and internal remittances. About 65 percent of the individuals from international remittance receiving households were out of the labor force, whereas this rate was about 60 percent in case of individuals who belonged to internal remittance recipient households.

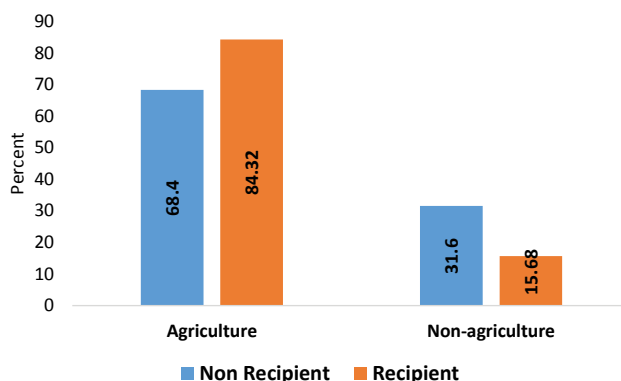
Figure 11.7: Participation in the labor force by sources of remittance



Source: HIES data, 2010

Figure 11.8 shows a sharp contrast between labor market participations in agricultural and non-agricultural sectors. About 85 percent of the total individuals from remittance receiving households were engaged in agricultural sector, whereas this rate is about 69 percent for individuals from the non-recipient households. It clearly shows that, individuals from remittance receiving households were more integrately occupied in the agricultural sector.

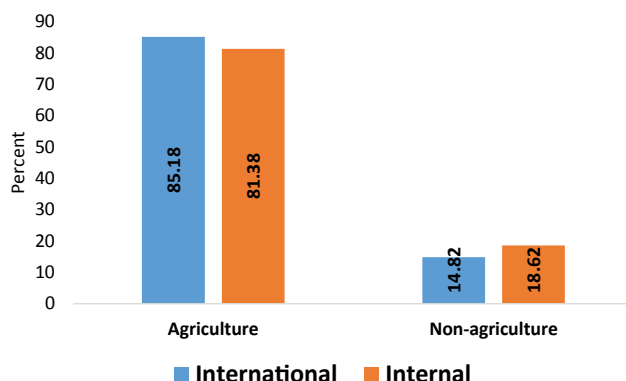
Figure 11.8: Participation in agricultural and non-agricultural sectors by remittance status



Source: HIES data, 2010

Figure 11.9 shows the labor force participation of the remittance receiving households by the source of remittance. It is vibrantly evident that, more than 80 percent of the individuals from the remittance receiving households, for both internal and international remittances, were engaged in agricultural sector.

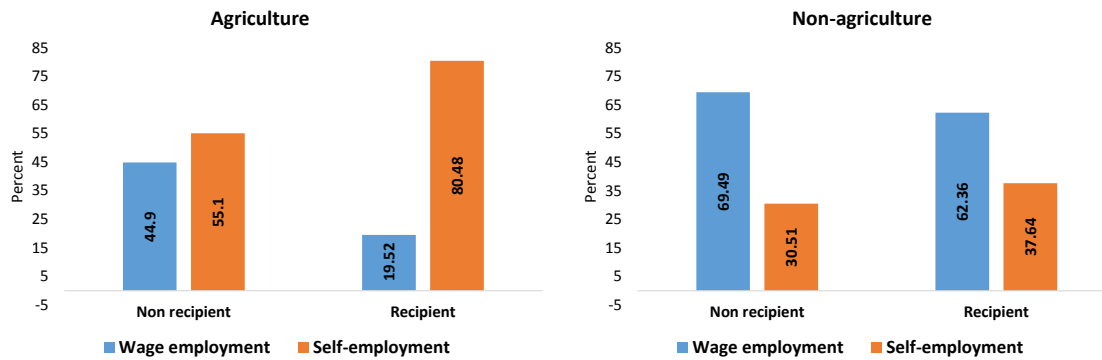
Figure 11.9: Participation in agricultural and non-agricultural sectors by sources of remittance



Source: HIES data, 2010

Figure 11.10 shows a sharp contrast in the employment status of recipient and non-recipient households. In 2010, agricultural sector was predominantly driven by self employment whether or not participants belonged to remittance receiving households. In contrast, non-agricultural sector was predominantly driven by wage employment irrespective of remittance status. However, the much larger pre-dominance of self-employment in agriculture among the remittance recipients over their counterparts resembles the fact that, with additional income from remittance, individuals tend to purchase land and move towards self-employment. Similarly, in the case of non-agriculture, remittance helps to mobilize required capital for self-employment. Therefore, it is seen from Figure 11.10 that the ratio of self-employed to wage employed among the remittance recipients are higher than that observed for the non-recipients.

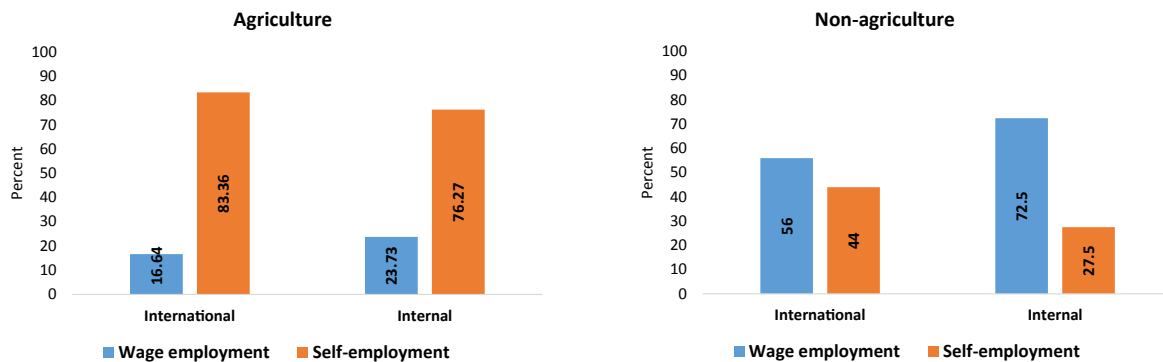
Figure 11.10: Status of employment (self vs wage) by remittance status



Source: HIES data, 2010

Figure 11.11 suggests that, if we consider international and internal remittances separately and compare between wage and self-employment, we find somewhat similar pattern of what is observed in Figure 11.10. However, even with the pre-dominance of self-employment, the relative importance of wage employment appears to be higher in the case of internal remittance than that of international remittance in agricultural sector. In non-agriculture, the relative importance of self-employment is greater in the case of international remittance than the internal one. This is primarily due to the fact that the amount of international remittance is much higher than the internal one, and thus international remittance has a larger capital generating effect for self-employment.

Figure 11.11: Employment status (self vs wage) by sources of remittance

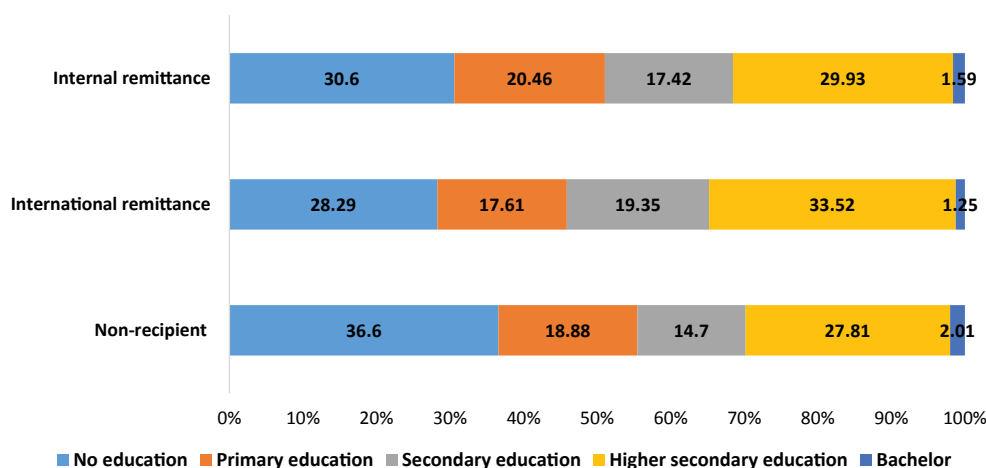


Source: HIES data, 2010

Education and remittance status

Figure 11.12 depicts the differences in educational attainments between the individuals from remittance recipient and non-recipient households. No-education was more prevalent among individuals from non-recipient households compared to individuals belonging to remittance recipient households (both international and internal). 55 percent of the individuals belonging to international remittance recipient households had education level equivalent to secondary education or above. In case of internal remittance, this rate was 50 percent, whereas in case of individuals from non-recipient households this rate was 45.5 percent. This suggests nothing but the fact that, remittance itself can play a role of 'push factor' in case of educational attainment which may further influence the labor market participation decision of those receiving remittance.

Figure 11.12: Level of education by remittance status



Source: HIES data, 2010

How does Remittance affect the Labor Force Participation (LFP) Behavior and Employment Choice? Insights from Econometric Exercises

To see the impact of remittances on the recipients in their labor market participation decision, we have used the Household Income and Expenditure Survey (HIES), 2010 data where there is a separate section for migration and household remittance information. We have categorized remittance recipients into two specific types based on the sources of remittance they are accruing from: recipient of international remittance and recipient of internal remittance. To see the desired impact of remittances, we first need to define the labor force. For simplicity, we have followed the definition of labor force used by the HIES, 2010. According to the definition of HIES 2010, any individual aged 15 or more who has been seeking work during the past 7 days or is willing to work or is in work are considered in the labor force. The definition also includes persons who could not work during the last 7 days due to leave, illness or other issues, and excludes persons who are physically disabled or aged old.

After segregating labor force participants from persons not in labor force, we have separated the labor force participants (considering only the employed) into two categories (i) agriculture and (ii) non-agriculture. The categories have been created for individuals belonging to both the remittance recipient and non-recipient households. Further, we have segregated the labor force participants into two categories according to their employment status: (i) self-employed and (ii) wage-employed for both the agricultural and non-agricultural sectors.

As our objective is to see the impacts of remittances over (i) labor force participation decisions (i.e. whether the recipient is in labor force or not), (ii) likeliness of sector employment (i.e. whether a person belonging to remittance recipient household prefers to engage in agriculture or non-agriculture sector), and (iii) over the employment status (i.e. whether the person receiving remittance is wage-employed or self-employed), our dependent variable is invariably dichotomous in nature. A possible and the easiest way to explore the narrated relationship is running an OLS regression which, in fact, will provide us with linear probability model (LPM) estimates. Despite its simple dexterity, a major drawback of LPM is that, it does not guarantee the estimated probability to be constrained between 0 and 1. And, that is why we need to pursue a non-linear maximum likelihood estimation. In this respect, the choice of logit or probit model depends upon the underlying assumption of the distribution of the error term. If the error term follows a logistic distribution, it is parsimonious to use a logit model. On the other hand, if the error term is assumed to follow a normal distribution, a probit model is suggested.

As stated above, we run following four probit regressions (assuming that, the error term is identically and independently distributed with a normal distribution) where our dependent variables take the values as following in the respective equations:

- Regression 1: The switch between not in LFP and LFP: 1 if the person is in labor force, 0 otherwise
- Regression 2: The switch between agricultural and non-agricultural sectors: 1 if the person is employed in non-agriculture, 0 if the person is employed in agriculture.
- Regression 3: The switch between wage employed and self-employed in agricultural sector: 1 if the person is self-employed in agriculture, 0 if the person is employed in wage-employed in agriculture
- Regression 4: The switch between wage employed and self-employed in non-agricultural sector: 1 if the person is self-employed in non-agriculture, 0 if the person is wage-employed in non-agriculture.

To see the impacts of remittances over the objected dependent variables we have considered dummy of international remittance recipient (1, if the individual belongs to a household that receives international remittances) and dummy of internal remittance recipient (1, if the individual belongs to a household that receives internal remittances) separately for each of the regressions. However, in all of these regressions our common set of considered explanatory variables are age, age square, size of the household, rural (dummy, 1 if rural), marital status (dummy, 1 if married), female (dummy, 1 if female), sex of the household head (dummy, 1 if the household head is a female), household income, years of schooling, and dependency ratio. Here, we have calculated the dependency ratio as the ratio of number of children (0-14 years old) and older persons (65 years or over) to the working-age population (15-64 years old) within a household.

Probit model to determine LFP vs not in LFP (regression 1)

To observe the impacts of remittances over labor force participation decision we run two separate regressions. In the first regression (regression 1a), we have estimated the impact of international remittances over labor force participation decision of the individuals who belong to international remittance receiving households. The average marginal effects of the regression are presented in Table 11.1. The results suggest a strong but negative influence of international remittances over the LFP of individuals from recipient households. On an average, the probability of participating in labor force is 8.6 percentage points lower for the individuals from the international remittance receiving households compared to the individuals from non-recipient households. On the other hand, in the second regression (regression 1b) we see the impacts of internal remittances over labor force participation decision, and we find that, internal remittance reduces the probability of a person from internal remittance receiving household to be in labor force by 3 percentage points compared to the person from non-recipient household.

In both of the regressions the impacts and magnitudes of age and age squared are quite similar and they suggest that, the probability of participating in labor force increases at a decreasing rate with the increase in age. The impacts of rural dummy, marital status, household size are found to have significantly negative associations with labor force participation decisions. The gender dummy shows that, females have almost 50 percentage points lower probability of participation in the labor force. Gender of the household head, years of schooling and household income are also found to be significant.

Table 11. 1: Average marginal effects from probit regressions

Variables	Marginal effects of regression 1a	Marginal effects of regression 1b
International Remittance	-0.086*** (0.007)	
Internal Remittance		-0.030*** (0.009)
Age	0.028*** (0.001)	0.029*** (0.001)
Age square	-0.00035*** (0.00001)	-0.00036*** (0.00001)
Household size	-0.003*** (0.001)	-0.004*** (0.001)
Rural dummy	-0.010*** (0.004)	-0.012*** (0.004)
Marital status	-0.015*** (0.005)	-0.020*** (0.005)
Dependency ratio	0.00001 (0.00003)	-0.00001 (0.00003)
Gender dummy	-0.493*** (0.001)	-0.494*** (0.001)
Household head gender dummy	0.087*** (0.006)	0.068*** (0.006)
Years of schooling	-0.006*** (0.000)	-0.007*** (0.000)
Household income	0.0000001*** (0.000000)	0.0000001*** (0.000000)
Number of observations	32,810	32,810

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are standard errors.

Probit model to determine agricultural vs non-agricultural employment (regression 2)

In the second set of regressions, our objective is to observe the impact of remittances over the choice of occupational source: i.e. we want to see, the role of remittances over the dynamics of choosing occupation in agriculture or non-agriculture.

Like the previous case, we run two regressions to see such dynamics where in the first regression (regression 2a) we see the impacts of international remittances and in the second regression (regression 2b) we see the impacts of internal remittances. The results of average marginal effects for both of the regressions are presented in Table 11.2. The results suggest that, individuals belonging to international remittance receiving households compared to their counterparts have 12.5 percentage points higher probability to be engaged in the agricultural sector than non-agricultural sector. Although to a lesser extent, we see a similar impact in the case of internal remittance: individuals belonging to internal remittance receiving households compared to their counterparts have almost 5 percentage points higher probability to be in the agricultural sector than non-agricultural sector. A possible explanation behind this shift could be that, remittance receiving households have higher tendency of purchasing lands with their remitted earnings than their counterparts. Like the previous case, age, age square, household size, gender dummy, household head's gender dummy, years of schooling and household income are found to be significant in both regressions.

Table 11. 2: Average marginal effects from probit regressions

Variables	Marginal effects of regression 2a	Marginal effects of regression 2b
International Remittance	-0.125*** (0.009)	
Internal Remittance		-0.047*** (0.012)
Age	0.030*** (0.001)	0.031*** (0.001)
Age square	0.0003814*** (0.0000140)	0.0003971*** (0.0000141)
Household size	-0.005*** (0.001)	-0.007*** (0.001)
Rural dummy	-0.144*** (0.004)	-0.145*** (0.004)
Marital status	0.006 (0.006)	0.002 (0.006)
Dependency ratio	0.0000275 (0.0000396)	0.0000213 (0.0000395)
Gender dummy	-0.403*** (0.003)	-0.406*** (0.003)
Household head gender dummy	0.110*** (0.008)	0.087*** (0.007)
Years of schooling	0.004*** (0.000)	0.004*** (0.000)
Household income	0.0000001*** (0.0000000)	0.0000001*** (0.0000000)
Number of observations	32,810	32,810

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are standard errors.

Probit model to determine the agricultural employment status (regression 3)

In the third set of regressions, our intention is to observe the impact of remittances over the employment status in the agricultural sector: i.e. how do remittances affect the employment choice between wage-employment and self-employment in the agricultural sector. The average marginal effects of this set of regressions are shown in Table 11.3. The results of the first regression (regression 3a) suggests that, if a household receives international remittances, the probability of getting into self-employment for any individual from that household increases by 21 percentage points compared to the individuals from non-recipient households. In case of internal remittances (regression 3b), the probability of an individual belonging to internal-remittance receiving household have 16 percentage points higher probability to be engaged in self-employment than wage employment compared to the individuals belonging to non-recipient households. The signs and significances of other major variables are found to be as expected for both regressions.

Table 11. 3: Average marginal effects from probit regressions for agricultural employment status

Variables	Marginal effects of regression 3a	Marginal effects of regression 3b
International Remittance	0.206*** (0.029)	
Internal Remittance		0.160*** (0.035)
Age	0.013*** (0.003)	0.012*** (0.003)
Age square	-0.00007* (0.00004)	-0.00006 (0.00004)
Household size	0.040*** (0.004)	0.043*** (0.004)
Rural dummy	0.082*** (0.019)	0.082*** (0.019)
Marital status	-0.019 (0.023)	-0.017 (0.023)
Dependency ratio	-0.00052*** (0.00011)	-0.00053*** (0.00011)
Gender dummy	-0.027 (0.026)	-0.036 (0.026)
Household head gender dummy	-0.019 (0.029)	0.006 (0.029)
Years of schooling	0.035*** (0.002)	0.036*** (0.002)
Household income	0.0000001* (0.0000001)	0.0000001 (0.0000001)
Number of observations	5,257	5,257

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are standard errors.

Probit model to determine the non-agricultural employment status (regression 4)

In the last set of regressions, our objective is to see the impact of remittances over the employment status in the non-agricultural sector: i.e. how do remittances affect the employment choice between wage-employment and self-employment in the non-agricultural sector.

The average marginal effects from probit regressions are depicted in the Table 11.4. Unlike the previous sets of regressions, we find different impacts of international and domestic remittances over the employment status in the case of non-agricultural sector. The probability of an individual belonging to international remittance recipient household to be in self-employment is 13 percentage points higher than an individual from non-recipient household (regression 4a). On the contrary, average marginal effect of internal remittance (regression 4b) is found to be insignificant. This result stylizes nothing but the fact that, international remittances plays a different role than the internal remittances in the case of self-employment in non-agricultural sector. In fact, self-employment in non-agricultural sector requires more seed capital than self-employment in agricultural sector. Hence, although internal remittances can play a role in the case of agricultural sector to shift an individual from wage employment to self-employment, its efficacy in the case of non-agricultural sector is found to be the opposite.

Table 11. 4: Average marginal effects from probit regressions for non-agricultural employment status

Variables	Marginal effects of regression 4a	Marginal effects of regression 4b
International Remittance	0.131*** (0.021)	
Internal Remittance		-0.040 (0.029)
Age	0.021*** (0.002)	0.021*** (0.002)
Age square	-0.00020*** (0.00003)	-0.00020*** (0.00003)
Household size	0.017*** (0.002)	0.018*** (0.002)
Rural dummy	0.032*** (0.009)	0.035*** (0.009)
Marital status	0.009 (0.015)	0.008 (0.015)
Dependency ratio	-0.00007 (0.00009)	-0.00010 (0.00009)
Gender dummy	-0.175*** (0.015)	-0.179*** (0.015)
Household head gender dummy	-0.092*** (0.019)	-0.081*** (0.019)
Years of schooling	-0.005*** (0.001)	-0.004*** (0.001)
Household income	0.0000001** (0.0000000)	0.0000001** (0.0000000)
Number of observations	10,386	10,386

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels respectively. The figures in parentheses are standard errors.

Conclusion

International remittance is an increasingly growing external financial source for Bangladesh. The issue of migration and remittance in Bangladesh is mainly motivated by the search for generating substantial welfare gains and increasing employment opportunities that can play an important role in poverty reduction. Our study has revealed three distinctive findings. First, despite its poverty reducing effect, remittances can lead to some depressing effect on labor force participation, as individuals from remittance-recipient households tend to have less incentive to participate in the labor market. Secondly, remittance has a significant impact over switching individuals from non-agriculture sector to agriculture sector. This may result from the remittance receiving household's preference for purchasing land with the remitted earnings. Finally, international remittance leads to a transition from wage employment to self-employment significantly, and this may be due to the availability of more investment capital which is essential for setting up own business in non-agricultural and agricultural activities (i.e. poultry farm, fishing etc).

Migration is seen as an important element in the process of development. The first finding of our exercise does not discourage migration. In contrast, migration needs to be promoted in a way that can persuade households with migrants to get involved in better economic activities. Policies can therefore be addressed aiming at creation of additional economic opportunities that will motivate households with migrants to develop entrepreneurship and to re-allocate flow of remittance more towards productive channels.

Growth and Distributional Impacts of Exogenous Demand Shock in Selected Activities in Bangladesh: Application of the Social Accounting Matrix Framework

Bazlul H. Khondker

Introduction

A Social Accounting Matrix (SAM) is a generalization of the production relations and extends this information beyond the structure of production to include: (a) the distribution of value-added to institutions generated by production activities; (b) formation of household and institutional income; (c) the pattern of consumption, savings and investment; (d) government revenue collection and associated expenditures and transactions; and (e) the role of the foreign sector in the formation of additional incomes for households and institutions. In particular, the accounting matrix of a SAM identifies the economic relations through six accounts: (1) total domestic supply of commodities; (2) activity accounts for producing sectors; (3) main factors of productions (e.g. labor types and capital); (4) current account transactions between main institutional agents such as-households and unincorporated enterprises, corporate enterprises, government and the rest of the world and the use of income by the representative households; (5) the rest of the world; and (6) one consolidated capital account (domestic and rest of the world) to capture the flows of savings and investment by institutions and the rest of the world, respectively.

Social accounting matrices can serve two basic purposes: (i) as a comprehensive and consistent data system for descriptive analysis of the structure of the economy; and (ii) as a basis for macroeconomic modeling. As a data framework, a SAM is a snapshot of a country at a point in time (Pyatt and Thorbecke, 1976). To provide as comprehensive a picture of the structure of the economy as possible, a particular novelty of the SAM approach has been to bring together macroeconomic data (such as national accounts) and microeconomic data (such as household surveys), within a consistent framework. The second purpose of a SAM is the provision of a macroeconomic data framework for policy modeling. The framework of a SAM can often help in establishing the sequence of interactions between agents and accounts which are being modeled. A SAM provides an excellent framework for exploring both macroeconomic and multi-sectoral issues and is a useful starting point for more complex models (Robinson, 1989).

Against this backdrop, this study produces an updated SAM for Bangladesh for 2012 using the newly constructed Input-Output Table 2012, which supplemented with institutional accounts, macro-economic aggregates, and the Household Income and Expenditure Survey. Using the updated SAM, this study develops the SAM multiplier model and explores the growth and distribution impacts of injection into selected activities in the economy through that multiplier model.

Bangladesh Social Accounting Matrix (SAM) 2012

The 2012 SAM identifies the economic relations through *four types of accounts*: (i) production activity and commodity accounts for the 86 sectors; (ii) 4 factors of productions with 2 different types of labor and 2 types of capital; (iii) current account transactions among the 4 main institutional agents; household-members and unincorporated capital, corporation, government and the rest of the world; and (iv) two consolidated capital accounts distinguished by public and private origins to capture the flows of savings and investment. The disaggregation of activities, commodities, factors and institutions in the SAM is given in Table 12.1.

Table 12.1: Disaggregation and description of Bangladesh SAM accounts

Set	Description of Elements
Activities (86)	
Agriculture (20)	Paddy Cultivation, Wheat Cultivation, Other Grain Cultivation, Jute Cultivation, Sugarcane Cultivation, Potato Cultivation, Vegetable Cultivation, Pulses Cultivation, Oilseed Cultivation, Fruit Cultivation, Cotton Cultivation, Tobacco Cultivation, Tea Cultivation, Spice Cultivation, Other Crop Cultivation, Livestock Rearing, Poultry Rearing, Shrimp Farming, Fishing, Forestry
Mining & Quarrying (01)	Mining and Quarrying
Manufacturing (39)	Rice Milling, Grain Milling, Fish Process, Oil Industry, Sweetener Industry, Tea Product, Salt Refining, Food Process, Tanning and Finishing, Leather Industry, Baling, Jute Fabrication, Yarn Industry, Cloth Milling, Handloom Cloth, Dyeing and Bleaching, Woven, Knitting, Toiletries, Cigarette Industry, Bidi Industry, Wood and Cork Product, Furniture Industry, Paper Industry, Printing and Publishing, Pharmaceuticals, Fertilizer Industry, Basic Chemical, Petroleum Refinery, Earth ware Industry, Plastic Products, Glass Industry, Clay Industry, Cement, Basic Metal, Metal, Machinery and Equipment, Transport Equipment, Miscellaneous Industry
Construction (04)	Building, Kutcha House, Agriculture Construction and Other Construction
Electricity, Gas and Water Supply (03)	Electricity, Water Generation, Gas Extraction and Distribution
Trade, and Transport (07)	Wholesale Trade, Retail Trade, Air Transport, Water Transport, Land Transport, Railway Transport, Other Transport,
Services (12)	Housing and Real Estate Service, Health Service, Education Service, Public Administration and Defense, Bank and other Financial Services, Insurance, Professional Service, Entertainment, Hotel and Restaurant, Communication, Other Services, ICT
Commodities (86)	
Agriculture (20)	Paddy Cultivation, Wheat Cultivation, Other Grain Cultivation, Jute Cultivation, Sugarcane Cultivation, Potato Cultivation, Vegetable Cultivation, Pulses Cultivation, Oilseed Cultivation, Fruit Cultivation, Cotton Cultivation, Tobacco Cultivation, Tea Cultivation, Spice Cultivation, Other Crop Cultivation, Livestock Rearing, Poultry Rearing, Shrimp Farming, Fishing, Forestry
Mining & Quarrying (01)	Mining and Quarrying
Manufacturing (39)	Rice Milling, Grain Milling, Fish Process, Oil Industry, Sweetener Industry, Tea Product, Salt Refining, Food Process, Tanning and Finishing, Leather Industry, Baling, Jute Fabrication, Yarn Industry, Cloth Milling, Handloom Cloth, Dyeing and Bleaching, Woven, Knitting, Toiletries, Cigarette Industry, Bidi Industry, Wood and Cork Product, Furniture Industry, Paper Industry, Printing and Publishing, Pharmaceuticals, Fertilizer Industry, Basic Chemical, Petroleum Refinery, Earth ware Industry, Plastic Products, Glass Industry, Clay Industry, Cement, Basic Metal, Metal, Machinery and Equipment, Transport Equipment, Miscellaneous Industry
Construction (04)	Building, Kutcha House, Agriculture Construction and Other Construction
Electricity, Gas and Water Supply (03)	Electricity, Water Generation, Gas Extraction and Distribution
Trade, and Transport (07)	Wholesale Trade, Retail Trade, Air Transport, Water Transport, Land Transport, Railway Transport, Other Transport,
Services (12)	Housing and Real Estate Service, Health Service, Education Service, Public Administration and Defense, Bank and other Financial Services, Insurance, Professional Service, Entertainment, Hotel and Restaurant, Communication, Other Services, ICT
Factors of Production (4)	
Labor (2)	Labor Unskilled, and Labor Skilled
Capital (2)	Capital and Land
Current Institutions (11)	
Households (8)	Rural: landless, Agricultural marginal, Agricultural small, Agricultural large, Non-farm poor and Non-farm non poor Urban: Households with low educated heads, and households with high educated heads
Others (3)	Government, Corporation and Rest of the World
Capital Institution (1)	
Capital	

Source: Author's compilation

The year 2012 was chosen as the base year to update/construct the Bangladesh SAM as most of data of the key components of activity-commodity and institutional accounts are available for the year 2012. Moreover, the newly constructed input-output table is also available for 2012 reflecting the consistent activity-commodity accounts for 2012. The consistent activity-commodity accounts then formed the basis from which the factors and institutional accounts were disaggregated to derive the Bangladesh SAM 2012.

The construction of 2012 SAM is based on several data sets drawn from diverse sources. They are listed below.

1. The Input-Output Table 2012 for Bangladesh; Prepared as a background document for the technical frame for the Seventh Five Year Plan.
2. Social Accounting Matrix for Bangladesh for 2006/07; General Economics Division, Bangladesh Planning Commission.
3. Bangladesh Bureau of Statistics (2011), Household Income and Expenditure Survey, 2010.
4. Ministry of Finance (2014), Economic Survey of Bangladesh.

The updating/construction of the SAM proceeded in two steps. In the first step, a ‘proto-SAM’ was constructed using the data collected from diverse sources. Since the data came from different sources as well as for different years, in line with the expectation, the estimated ‘proto-SAM’ was unbalanced. In the second step, the SAM was balanced by adjusting the activity and commodity (i.e. private consumption, intermediate demand vectors) accounts as explained below.

The updating of a SAM is not only an exercise in putting together a complete data set, but also an estimation process on the basis of insufficient and partly inconsistent data. In this current exercise, the first step to generate a consistent and balanced SAM is to build a macroeconomic SAM (i.e. the Macro SAM). The main objective of the Macro SAM is to summarize and to show the circular flow in the economy in general and inter-dependence between commodity, activity, consumption, and flow-of-fund accounts without sectoral or institutional details. Thus, in the second step a preliminary disaggregated SAM (which is also referred to as the Micro SAM) is constructed using available disaggregated information drawn from various data producing agencies. Subject to data availability, the disaggregated SAM segregates most of the Macro SAM accounts to desired sectoral and institutional breakdowns. While ensuring balance between the receipts and outlays for all accounts, the disaggregated or micro SAM must reproduce the control totals of the macro SAM. The correspondence between accounts of the aggregated micro SAM and macro SAM thus ensure its desired consistency with the national account data.

The complete Macro SAM for 2012 containing the national accounts and other data including transfers, taxes and foreign transactions is shown in Table 12.2. The Bangladesh macro SAM is “anchored” primarily to the ‘Input-Output Table 2012’, ‘National Accounts’ data and other macro aggregates. The distribution of labor value-added to households and capital value-added channeled through the enterprise account is derived from information contained in the SAM 2000. Savings of households and enterprises have been adjusted to fulfil the macroeconomic balance of the SAM. Government savings are computed as the difference between total government receipts and total government spending.

Table 12.2: Bangladesh Macro SAM 2012 (Billion Taka)

SAM Accounts	SNA Accounts	Code		ACT	COM	Factors						Domestic Institutions			Capital		RoW	Total Incom	
			1	2	3						4			5		6			
					Labour	Capital	Land	Indirect Tax	M duty	P Subsidy	E Subsidy	Household	Government	Corporation	Capital	Inventory			
Activity A/C	Activities	1		0	18,080													18,080	
Production A/C	Commodities	2		9,212								6,980	513		2,437	73	2,127	21,343	
Distribution of Primary Income	Income Generation by Institutions	3	Compensation To Employees	4,457														4,457	
			Operating Surplus	3,672														3,672	
			Land Return	516														516	
			Indirect Tax	346														346	
			Import Duty		314													314	
			Production Subsidy	-58														-58	
			Export Subsidy	-65														-65	
Use of Income	Primary Income of Institutions	4	Household			4,457	2,807	516					470				1,016	9,266	
			Government						346	314	-58	-65	141		337			1,015	
			Corporation				864						3					867	
Consolidated Capital AC	Capital Account	5	Capital									2,144	30	530			-194	2,510	
			Inventory													73		73	
Rest of World	Rest of the World-Imports (current)	6			2,949													2,949	
Total Expenditure A/C					18,080	21,343	4,457	3,672	516	346	314	-58	-65	9,266	1,015	867	2,510	73	2,949

Note: Based on the SNA-SAM Relationship

Source: Author’s compilation

SAM Accounting Multipliers: Modeling and Analysis

Determination of the endogenous and exogenous accounts

A social accounting matrix has the principal objective of providing the statistical basis for creating a plausible model in order to analyze how the economy works and predict the effects of policy interventions in order to change it. The move from the SAM structure to a model structure requires that accounts of this matrix be separated into *endogenous and exogenous accounts*. The need for this arises from the fact that there must be an

entry into the system, i.e. some variables must be manipulated exogenously via injections in order to evaluate the consequences on the endogenous accounts. In general, the following criteria may be applied to separate SAM accounts into endogenous and exogenous (Alarcon, 2000).

Endogenous accounts:

- accounts *a priori* specified as objectives or targets when the SAM was built must be made endogenous.

Exogenous accounts:

- accounts intended to be used as policy instruments must be made exogenous;
- accounts beyond the control of domestic institutions should be made exogenous, e.g. the rest of the world current and capital accounts. This is consistent with the “small economy” assumptions;
- accounts determined outside the system must be made exogenous;
- accounts, which do not exert effects over other accounts within the time horizon under consideration should be made exogenous, e.g. in the short-term the capital accounts of all accounts. This criterion is consistent with the existence of idle capacity in the economy.

Following the above criteria a selection has been made for the endogenous and exogenous accounts for Bangladesh SAM case.

- The following four accounts have been selected as *endogenous accounts*: Production Activities account (i.e. activity account and commodity account), Factors of Production account, and Households account.
- Government account is made *exogenous* because it serves as policy instrument (e.g. government transfers, direct tax, government expenditures etc.)
- Since the rest of the world account and the consolidated capital account are beyond the control of the domestic economy and Bangladesh is a small country, they have been considered as *exogenous accounts*. Corporations have been designated as an *exogenous account*.

Underlying assumptions

The assumptions of the SAM model are as follows (Alarcon, 2000):

- the “average propensities to spend”, i.e. the ratios between the particular expenditures and the total expenditure belonging to the same account, are fixed and linear;
- the “average propensities to spend” are valued at constant prices, further they are considered stable over the short-to-medium term;
- the expenditure shares within each defined expenditure account (the equivalent of the constant market shares in I-O) remain (approximately) constant over time;
- price relatives are constant over the time horizon of the model, usually the short-term. This implies that the components which make up any account bunch have substitution elasticities which are zero across accounts and infinite within accounts, i.e. they are homogenous within and heterogeneous across accounts;
- expenditure-income elasticities are constant for the fixed-price model, while they are constant and equal to unity for the accounting multiplier model;
- there is perfect Complementarity between capital & other factor inputs (capital, labor and land);
- the economy has idle capacity utilization, and
- a number of accounts are exogenous.

SAM Accounting Multiplier

For any given injection into the exogenous accounts of the SAM, influence is transmitted through the interdependent SAM system among the endogenous accounts (*c.f. Flow Chart 1*). The interwoven nature of the

system implies that the incomes of factors, institutions and production are all derived from exogenous injections into the economy via a multiplier process. The multiplier process is developed here on the assumption that when an endogenous income account receives an exogenous expenditure injection, it spends it in the same proportions as shown in the matrix of average propensities to spend (APS). The elements of the APS matrix is calculated by dividing each cell by its corresponding column sum totals.

The multiplier analysis using the SAM framework helps us in understanding further the linkages between the different sectors and the institutional agents at work within the economy. Accounting multipliers have been calculated according to the standard formula for accounting (impact) multipliers, as follows:

$$y = A * y + x = (I - A)^{-1} * x = Ma * x$$

Where: y – vector of endogenous variables

x – vector of exogenous variables

A – matrix of average propensities of expenditures for endogenous accounts

$Ma = (I - A)^{-1}$ = matrix of aggregate accounting multipliers (or the generalized Leontief inverse).

Since the present multiplier framework has four endogenous accounts, for each account in the SAM we can calculate four types of multiplier measures:

- 1) The activity or gross output multiplier, which indicates the total effect on sectoral gross output of a unit-income increase in a given account i in the SAM, is obtained by adding the activity elements in the matrix along the column for account i .
- 2) The value added or GDP multiplier, giving the total increase in GDP resulting from the same unit-income injection, is derived by summing up the factor-payment elements along account i 's column.
- 3) The basic need multiplier, showing the total increase in the consumption of basic needs resulting from the unit-income injection, is obtained by summing up the basic need elements along the column of account i .
- 4) Household income multiplier shows the total effect on household income and is obtained by adding the elements for the household group along account i 's column.

Backward and forward linkages (total and partial)

Each of the columns of the matrix of accounting multipliers, as indicated before, show the effects of each corresponding exogenous injection on the incomes of endogenous accounts. Analogously to the I-O model the sum total of a column or a row can be calculated and they will be equivalent to the backward and forward income or expenditure linkages. In SAM models within account sums of columns or rows is calculated for each of the four endogenous accounts as well as the total column and row sums of all the endogenous accounts taken together. The former can be called “partial backward or forward linkages” or within account backward or forward linkages and the latter “total backward or forward linkages”. As shown in the earlier section, partial backward linkages can also be named after their corresponding account multipliers such as backward and forward linkages for activity, factors, households and basic needs⁵. Therefore in conclusion we can say that the basic idea of backward linkages is to trace the output increases which occur in *supplying* sectors or accounts when there is a change in the sector or account using their outputs as inputs, just as with forward linkages we trace the output increases which occur or might occur in *using* industries or accounts when there is a change in the sector or account supplying inputs (Bulmer-Thomas, 1982).

Within the SAM context given an exogenous injection into the system (e.g. government expenditure on education activity) the first effect will be to increase income of the corresponding account (i.e. activity), in turn the increase will trigger off effects on the incomes of all other endogenous accounts (i.e. factors, households etc., the sum of all these effects constitutes its total backward linkage.

Growth Impact of Injection into Selected Activities

Selection of activities

The injection may be viewed as an exogenous increase in the demand e.g. exports; government expenditures and inventory. For analytical purpose some particular activities were selected to assess the multipliers and backward linkages to prioritize among the activities in order to attain the highest possible growth impact of equivalent alternative intervention. In this analysis we have selected four activities such as *Rice Milling, Education, Ready-Made Garments and Construction*. The selection was based on criteria like high backward linkages, export-orientation, human capital improvements, and infrastructure development.

Table 12.3: Impact analysis of injection into some selected activities in 2012

Multipliers	Rice Milling	Education	Ready Made Garments	Construction
Gross Output Multiplier	4.203	3.300	3.213	3.531
Commodity Multiplier	3.609	2.666	3.724	2.950
GDP Multiplier	1.873	1.873	1.523	1.590
Household Income Multiplier	1.729	1.733	1.370	1.421
Total Backward Linkage	11.415	9.571	9.830	9.492

Source: SAM multiplier analysis

The overall impact on all accounts added together (known as total backward Linkage); due to a unit injection into Rice Milling, Education, Ready Made Garments and Construction are 11.415, 9.571, 9.83 and 9.492 respectively (Table 12.3). In other words, a unit injection into Rice-Milling yields 11.415 units of income in the economy and the same implication holds for other three activities. The decomposition of the total backward linkages into the four “within endogenous” accounts is discussed below.

The impact on all production accounts for the four selected sectors as measured by the Gross Output Multiplier are 4.203 units, 3.300 units, 3.213 units and 3.531 units respectively. It is observed that gross output multipliers are the highest backward linkages among all the four multipliers. This is due to the fact that production activities have to meet the increase in final demand as well as intermediate demand. This dual impulse for the production activity accounts translates into the highest values of the gross output multipliers.

The composition of Gross Output backward Linkage for each of the four selected sectors and by the 86 sectors is presented in Table 12.4. Among all activities the Rice-Milling sector is relatively strongly integrated with sectors such as Paddy (0.986), Trade (0.43), and Transport (0.23). The sectors, which are relatively better integrated with the Education sector, are Other-services (0.30), Rice-Milling (0.25), Trade (0.24), Transport (0.16) and Housing (0.15). The Ready Made Garment sector has the lowest BL among the four selected sectors because of its high import intensity in production. Like other two sectors, Ready Made Garment sector is also relatively better integrated with Trade (0.28), Rice-Milling (0.20), Cloth-Milling Yarn (0.12) and Transport sectors (0.17). Similar integration pattern is also observed for Construction.

Table 12.4 also shows that the sectors which are strongly associated with *Construction* sector are *Trade* (0.29), other services (0.28), *Rice-Milling* (0.21) and *Transport* (0.16). This reveals the fact that rice, which is provided by the *Rice-Milling* sector, is a major component of the basic food consumption. On the other hand almost all the sectors use the products of the *Trade* and *Transports* sectors. Therefore these three sectors are better integrated into the system. Other services, which encompass variety of services, also emerged as better integrated sectors to other sectors of the economy.

⁵ The interpretation of partial (within account) backward and forward linkages within a SAM framework is also similar to that of I-O models. Although the sum of all the elements, in any column (row) of the accounting multipliers matrix, could be read as the backward (forward) linkages of the expenditure-injection multipliers, the interpretation in SAM is not so straight forward because the linkages are composites of the effects of several kinds of accounts.

Table 12.4: Impact analysis of injection into the four selected sectors on all the activities in 2012

Activities	Rice Milling	Education	Ready Made Garments	Construction
Paddy Cultivation	0.98519	0.20072	0.16585	0.17256
Wheat Cultivation	0.00586	0.00584	0.00469	0.00485
Other Grain Cultivation	0.00764	0.00754	0.00615	0.00629
Jute Cultivation	0.00159	0.00160	0.00216	0.00129
Sugarcane Cultivation	0.00388	0.00380	0.00310	0.00319
Potato Cultivation	0.02316	0.02251	0.01842	0.01912
Vegetable Cultivation	0.01647	0.01601	0.01310	0.01360
Pulses Cultivation	0.00420	0.00416	0.00336	0.00347
Oilseed Cultivation	0.00499	0.00492	0.00397	0.00409
Fruit Cultivation	0.01804	0.01791	0.01438	0.01485
Cotton Cultivation	0.00003	0.00004	0.00026	0.00003
Tobacco Cultivation	0.00114	0.00111	0.00091	0.00094
Tea Cultivation	0.00161	0.00157	0.00131	0.00133
Spice Cultivation	0.01771	0.01730	0.01435	0.01464
Other Crop Cultivation	0.00576	0.00659	0.00427	0.00443
Livestock Rearing	0.04642	0.03967	0.03204	0.03308
Poultry Rearing	0.05941	0.05863	0.04781	0.04891
Shrimp Farming	0.02463	0.02465	0.02020	0.02053
Fishing	0.07500	0.07373	0.05983	0.06199
Forestry	0.02662	0.02406	0.02022	0.08780
Rice Milling	1.26170	0.24951	0.20636	0.21477
Grain Milling	0.03178	0.03155	0.02546	0.02635
Fish Process	0.00322	0.00321	0.00257	0.00266
Oil Industry	0.02083	0.02070	0.01664	0.01721
Sweetener Industry	0.00800	0.00790	0.00633	0.00654
Tea Product	0.00098	0.00096	0.00080	0.00081
Salt Refining	0.00141	0.00183	0.00113	0.00116
Food Process	0.02594	0.02667	0.02084	0.02157
Tanning and Finishing	0.00630	0.00627	0.00504	0.00528
Leather Industry	0.01490	0.01484	0.01192	0.01248
Baling	0.00004	0.00006	0.00039	0.00004
Jute Fabrication	0.00003	0.00003	0.00003	0.00004
Yarn Industry	0.00218	0.00267	0.01734	0.00182
Cloth Milling	0.00555	0.00989	0.09839	0.00474
Handloom Cloth	0.04036	0.04047	0.03235	0.03343
Dyeing and Bleaching	0.00494	0.00495	0.00396	0.00409
RMG	0.00420	0.00410	1.00390	0.00339
Knitting	0.00220	0.00216	0.00202	0.00181
Toiletries M	0.00235	0.00336	0.00204	0.00256
Cigarette Industry	0.03741	0.03629	0.02969	0.03084
Bidi Industry	0.00287	0.00262	0.00222	0.00233
Wood and Cork Product	0.01191	0.00700	0.00588	0.01033
Furniture Industry	0.00854	0.00835	0.00672	0.00701
Paper Industry	0.00433	0.00378	0.00422	0.00382
Printing and Publishing	0.00874	0.00685	0.00489	0.00595
Pharmaceuticals	0.02740	0.07351	0.02233	0.02310
Fertilizer Industry	0.03438	0.00942	0.00774	0.00810
Basic Chemical	0.00136	0.00182	0.00114	0.00348
Petroleum R	0.02371	0.02286	0.02036	0.01907
Earth ware Industry	0.00196	0.00197	0.00157	0.00168
Plastic Products	0.00502	0.00511	0.00406	0.00737
Glass Industry	0.00148	0.00139	0.00115	0.00227
Clay Industry	0.00013	0.00014	0.00019	0.01126
Cement M	0.00036	0.00040	0.00047	0.06705
Basic Metal M	0.00816	0.00789	0.01124	0.23991
Metal M	0.00596	0.00514	0.01241	0.02598
Machinery and Equipment	0.00754	0.00464	0.00402	0.00525
Transport Equipment	0.00298	0.00249	0.00301	0.00232
Miscellaneous Industry	0.00767	0.00774	0.00691	0.00719
Building	0.00293	0.00336	0.00303	1.00415
Kutcha House	0.00216	0.00245	0.00198	0.00308
Agriculture Construction	0.00000	0.00000	0.00000	0.00000
Other Construction	0.00369	0.00254	0.00463	0.00261
Electricity Generation	0.01628	0.02091	0.03570	0.01636
Water Generation	0.00138	0.00188	0.00151	0.00142
Gas Extraction and Distribution	0.00586	0.00715	0.01630	0.00643
Mining and Quarrying	0.00479	0.00514	0.00613	0.04289
Wholesale Trade	0.16337	0.09420	0.10768	0.10838
Retail Trade	0.26532	0.15120	0.17415	0.17540
Air Transport	0.00175	0.00175	0.00136	0.00143
Water Transport	0.01321	0.00911	0.02234	0.00935
Land Transport	0.23468	0.15910	0.27403	0.16447
Railway Transport	0.00201	0.00135	0.00381	0.00140

Contd.

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Activities	Rice Milling	Education	Ready Made Garments	Construction
Other Transport	0.00613	0.00564	0.00690	0.00531
Housing and Real Estate Service	0.12849	0.15040	0.13939	0.12017
Health Service	0.05460	0.05325	0.04711	0.04631
Education Service	0.03877	1.04005	0.03125	0.03210
Public Administration and Defense	0.01295	0.01008	0.02002	0.02223
Bank and Other Financial Services	0.02745	0.03164	0.04292	0.04179
Insurance	0.00604	0.00787	0.01044	0.01485
Professional Service	0.00103	0.00087	0.00177	0.00139
Hotel and Restaurant	0.03994	0.03891	0.03422	0.03299
Entertainment	0.00567	0.00568	0.00449	0.00463
Communication	0.01793	0.02097	0.02232	0.03050
Other Services	0.17830	0.30046	0.17078	0.27874
Information Technology and E-commerce	0.00062	0.00068	0.00085	0.00082
Total Gross Output Multiplier	4.203	3.300	3.213	3.531

Source: SAM multiplier analysis

The generations of factor income, as measured by the GDP multiplier, for each of selected sectors are 1.873 units, 1.873 units, 1.531 units and 1.590 units respectively (Table 12.5). This increase in factor income is due to the fact that in order to increase production more of all factors need to be engaged and hence further payments must be made for them.

Table 12.5: Impact analysis of injection into some selected sectors on value-addition

Factors	Rice Milling	Education	Ready Made Garments	Construction
Labor	0.966	1.186	0.801	0.793
Capital	0.907	0.686	0.730	0.796
Total GDP Multiplier	1.873	1.873	1.531	1.590

Source: SAM multiplier analysis

Decomposition of total factor income between labor and capital factors reveals a mixed pattern (Table 12.5). More factor income is accrued to labor factor than capital factor in the case of Rice Milling, Education and Ready Made Garments sectors. This arises out of higher cumulative effect on labor income as compared to capital income. This means those sectors, which pay more labor income, are triggered by injecting into these activities. On the other hand, only in the case of Construction sector more factor income is accrued to labor compared to capital. This arises out of higher cumulative effect on capital income as compared to labor income. This means those sectors, which pay more capital income, are triggered by injecting into these activities. Decomposition of factor income suggests that if the objectives were to promote growth along with more income for *labor*, then intervention in sectors like *Rice-Milling*, *Education* and *Ready Made Garments* be preferred over the sector such as *Construction*.

Table 12.6: Impact of injection into some selected sectors on households' income

Households	Rice Milling	Education	Ready Made Garments	Construction
Rural				
Landless	0.09864	0.10032	0.08575	0.08992
Marginal farmer	0.10605	0.09780	0.08292	0.08678
Small farmer	0.22936	0.18655	0.15556	0.16211
Large farmer	0.18294	0.11762	0.09656	0.10013
Day labor	0.13005	0.12219	0.09956	0.10326
Self employed	0.28161	0.26410	0.25115	0.26912
Employee	0.15123	0.15821	0.12974	0.13488
Urban				
Day labor	0.11225	0.10333	0.08676	0.09056
Self employed	0.24351	0.30530	0.21778	0.21896
Employee	0.19363	0.27720	0.17116	0.16504
Total Household Income Multiplier	1.729	1.733	1.377	1.421

Source: SAM multiplier analysis

The next impact is on household income through the interdependence of the system. The factorial income is then transferred to household. Household income generation as measured by the multiplier on all household income will be 1.729 units, 1.733 units, 1.377 units and 1.421 units respectively for *Rice-Milling*, *Education*, *Ready Made Garments* and *Construction* (Table 12.6). The estimates of HH income multiplier when compared with Value added

(or factor) multipliers suggest that the full amount of factorial income is not being transferred to household. For instance, in the case of *Rice-Milling* factor income multiplier is 2.085 while the household income multiplier is 1.729. The discrepancy between these two income multipliers is because of “leakage” of capital factor income to two exogenous accounts e.g. *Government* and *Corporation*.

Distribution of total household income between households envisage that as a group Self-employed household receives highest income followed by Employee and Small Farmers due to larger sizes of these household groups compared to the remaining other household groups. The lowest income is being accrued to the Landless household group envisaging their weak social and economic integration within the system. However, it is imperative to note that for policy purpose per capita income estimates be considered rather than the household income because of disproportionate association between income of household groups and their population size.

Conclusion

The analysis presented in this paper suggests that an exogenous increase in the demand (e.g. exports; government expenditures and inventory) in some prioritized activities, such as Rice Milling, Education, Ready-Made Garments and Construction, can lead to large impacts on gross output, GDP and household income through their backward linkages in the economy. Results from the SAM multiplier model shows that while Rice Milling, Education and Construction have high backward linkages with different agricultural, manufacturing and services sectors, the Ready Made Garment sector has the lowest backward linkages among the four selected sectors because of its high import intensity in production.

Such an exogenous increase in the demand results in the increase in factor income due to the fact that in order to increase production, more of all factors need to be engaged, and hence, further payments must be made for them. However, the decomposition of total factor income between labor and capital factors shows that more factor income is accrued to labor factor than capital factor in the case of labor intensive sectors such as Rice Milling, Education and Ready Made Garments sectors. The opposite result is observed in the case of Construction sector, which a capital intensive sector. This suggests that intervention in sectors like Rice-Milling, Education and Ready Made Garments should be preferred over the sector such as Construction, if the objectives were to promote growth along with more income for labor.

Such an exogenous increase in the demand also leads to a rise in household incomes. However, the distribution of income between households is unequal and it appears that, as a group, Self-employed household receives highest income followed by Employee and Small Farmers due to larger sizes of these household groups compared to the remaining other household groups. The lowest income is being accrued to the Landless household group envisaging their weak social and economic integration within the system.

Economy-wide and Employment Effects of different Scenarios in Bangladesh: Application of a CGE Model

Selim Raihan

Introduction

Over the past three decades, computable general equilibrium (CGE) models have become an important tool for empirical economic analysis. CGE models offer a comprehensive way of modeling the overall impact of policy changes on an economy or a region by considering all production activities, factors and institutions. Such models also include factors such as markets and macroeconomic components: investment and savings, balance of payments and government budget. CGE models are applauded for being able to incorporate multiple economic linkages that often come handy in explaining trends and structural responses to changes in development policy.

CGE analysis, allows for the assessment of the impacts of exogenous shocks within a constrained optimization framework. At the core of the CGE model is a set of equations describing the behavior of various economic agents (such as firms and households) when faced with changes in relative prices. In an increasingly market oriented economy, the variations in prices may be the most important sources of re-allocation of resources among competing activities which then may alter the factorial income and hence personal income distribution. Changes in personal income distribution of household groups and consumer price indices may have different implications on the welfare and poverty situations of the distinct household groups. Against this backdrop, this paper employs the CGE model for the Bangladesh economy to explore the impacts of a set of policy and natural disaster shock scenarios. These include a rise in crop productivity, a rise in the demand for labor-intensive exports, a rise in the allocation for social protection to households, and a natural disaster shock. A Social Accounting Matrix (SAM) prepared for the year 2012 serves as the consistent and comprehensive database for the above-mentioned exercises.

Methodology

The CGE model

The Bangladesh CGE model is built using the PEP standard static model. In the Bangladesh CGE model representative firms in each industry maximizes profits subject to its production technology. The sectoral output follows a Leontief production function. Each industry's value added consists of composite labor and composite capital, following a constant elasticity of substitution (CES) specification. Different categories of labor are combined following a constant elasticity of substitution (CES) technology with imperfect substitutability between different types of labor. Composite capital is a CES combination of the different categories of capital. It is assumed that intermediate inputs are perfectly complementary, and are combined following a Leontief production function.

Household incomes come from labor income, capital income, and transfers received from other agents. Subtracting direct taxes yields household's disposable income. Household savings are a linear function of disposable income, which allows for the marginal propensity to save being different from the average propensity.

Corporation income consists of its share of capital income and of transfers received from other agents. Deducting business income taxes from total income yields the disposable income of each type of business. Likewise, business savings are the residual that remains after subtracting transfers to other agents from disposable income.

The government draws its income from household and business income taxes, taxes on products and on imports, and other taxes on production. Income taxes are described as a linear function of total income, whether it be for households or for businesses. The current government budget surplus or deficit (positive or negative savings) is the difference between its revenue and its expenditures. The latter consist of transfers to agents and current expenditures on goods and services.

The rest of the world receives payments for the value of imports, part of the income of capital, and transfers from domestic agents. Foreign spending in the domestic economy consists of the value of exports, and transfers to domestic agents. The difference between foreign receipts and spending is the amount of rest-of-the-world savings, which are equal in absolute value to the current account balance, but of opposite sign.

The demand for goods and services, whether domestically produced or imported, consists of household consumption demand, investment demand, demand by government, and demand as transport or trade margins. It is assumed that households have Stone-Geary utility functions (from which derives the Linear Expenditure System). Investment demand includes both gross fixed capital formation (GFCF) and changes in inventories. .

Producers' supply behavior is represented by nested CET functions: on the upper level, aggregate output is allocated to individual products; on the lower level, the supply of each product is distributed between the domestic market and exports. The model departs from the 'pure' form of the small-country hypothesis. A local producer can increase his share of the world market only by offering a price that is advantageous relative to the (exogenous) world price. The ease with which his share can be increased depends on the degree of substitutability of the proposed product to competing products; in other words, it depends on the price-elasticity of export demand. Commodities demanded on the domestic market are composite goods, combinations of locally produced goods and imports. The imperfect substitutability between the two is represented by a constant elasticity of substitution (CES) aggregator function. Naturally, for goods with no competition from imports, the demand for the composite commodity is the demand for the domestically produced good.

The system requires that there is equilibrium between the supply and demand of each commodity on the domestic market. Also there are equilibriums in the factor markets. Total investment expenditure must be equal to the sum of agents' savings. The sum of supplies of every commodity by local producers must be equal to domestic demand for that commodity produced locally. And finally, supply to the export market of each good must be matched by demand.

A brief description of the Social Account Matrix (SAM) of Bangladesh for 2012

This study uses the 2012 SAM for Bangladesh, which has the following accounts: (1) total domestic supply of 10 commodities; (2) production accounts for 10 activities; (3) 4 factors of productions - two labor types and two capital categories; (4) current account transactions between 4 current institutional agents - households and unincorporated capital, corporate enterprises, government and the rest of the world; household account includes seven representative groups (5 rural and 2 urban); and (5) one consolidated capital account. The structure of the Bangladesh SAM is described in Table 13.1.

Table 13.1: Description of Bangladesh SAM Accounts for 2012

Set	Description of Elements
Activity (10)	Grains and Crops, Livestock and Meat Products, Mining and Extraction, Processed Food, Textiles and Clothing, Light Manufacturing, Heavy Manufacturing, Utilities and Construction, Transport and Communication, Other Services.
Commodity (10)	Grains and Crops, Livestock and Meat Products, Mining and Extraction, Processed Food, Textiles and Clothing, Light Manufacturing, Heavy Manufacturing, Utilities and Construction, Transport and Communication, Other Services.
Factors of Production (4)	Unskilled labor, Skilled labor, Capital and Land
Households (7)	<i>Rural</i> : Landless, Agricultural marginal, Agricultural small, Agricultural large, Non-farm <i>Urban</i> : Households with low educated heads, households with high educated heads
Other Institutions (4)	Government; Corporation; Rest of the World, Capital

Source: Raihan (2014)

Structure of the economy as in 2012 SAM

Table 13.2 presents the structure of the Bangladesh economy as represented in the SAM 2012. In terms of value-addition, among the agricultural sectors, the leading sector is the grains and crops with 11.33 percent share; among the manufacturing sectors, the leading sector is textile and clothing (7.55 percent); and among the services sectors, the leading sector is transport and communication (27.65 percent). The textile and clothing sector is highly export oriented. The export basket is highly concentrated as 88.12 percent exports come from textile and clothing. The heavy manufacturing sector is highly import dependent. In the case of tariff rate, agricultural sectors have lower tariff rates than the manufacturing sectors.

Table 13.2: Structure of the Bangladesh economy in 2012 as reflected in the SAM 2012

Sectors	1	2	3	4	5	6
	Vi/TV	Ei/Oi	Ei/TE	Mi/Oi	Mi/TM	TAR
Grains and Crops	11.33	0.42	0.56	9.09	8.05	4.52
Livestock and Meat Products	1.25	0.07	0.01	2.25	0.25	8.22
Mining and Extraction	6.60	0.16	0.08	2.20	0.75	7.61
Processed Food	1.34	1.53	1.59	15.96	10.87	13.38
Textiles and Clothing	7.55	51.68	88.12	17.57	19.70	25.33
Light Manufacturing	1.74	2.41	1.44	20.83	8.22	19.59
Heavy Manufacturing	0.99	1.17	1.26	60.96	43.16	11.77
Utilities and Construction	16.86	-	-	-	-	-
Transport and Communication	27.65	2.87	6.30	2.42	3.49	-
Other Services	24.69	0.28	0.63	3.65	5.52	-
Total	100.00	—	100.00	—	100.00	—

Note: Vi=sectoral value added, TV=total value added, Ei=sectoral export, Oi=sectoral output, TE=total export, Mi=sectoral import, TM=total import, TAR=tariff rate, All figures are expressed in percentages.

Source: Raihan (2014)

Simulations in the Bangladesh CGE Model and Results

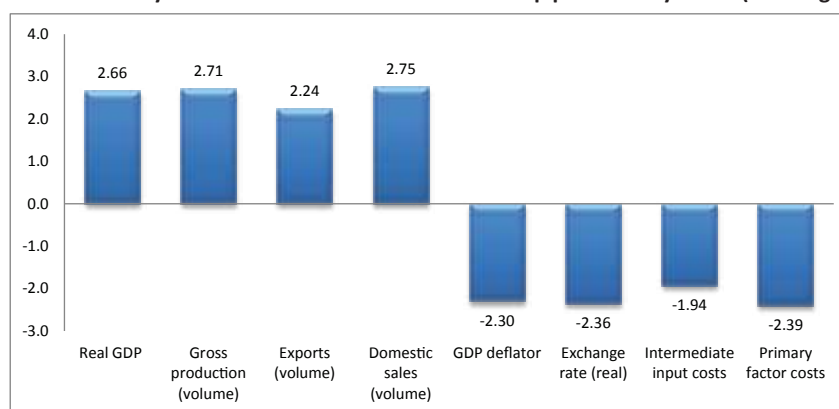
Using the Bangladesh CGE model four different scenarios are run. They are (i) a rise in the crop productivity by 20 percent, (ii) a rise in the demand for labor-intensive exports by 25 percent, (iii) doubling the current allocation of social protection to households, and (iv) a natural disaster shock where the economy's capital stock falls by 5 percent.

A rise in the crop productivity by 20 percent

This scenario considers a rise in the total factor productivity in the crop sector by 20 percent. Under this scenario, a set of closure assumptions are imposed on the CGE model where total stocks of land, tax rates, total real inventories, government savings and current account balance are exogenous, whereas total investment expenditure and total real government expenditures are held endogenous. Capital is mobile across sectors. Labor supply is flexible with fixed wage rates. The nominal exchange rate is the model's numéraire.

The macroeconomic effects of the crop productivity shock are presented in Figure 13.1. It appears that such a positive productivity shock in the crop sector would lead to 2.66 percent rise in the real GDP. The impacts on gross production and domestic sales would be in similar magnitudes. There will a depreciation in the real exchange rate, and falls in both intermediate input costs and primary factor costs, which would lead to a rise in the exports by 2.24 percent. Furthermore, the GDP deflator would fall by 2.3 percent.

Figure 13.1: Effects on key macroeconomic variables for the crop productivity shock (% change from base)



Source: Simulation in the Bangladesh CGE model

Table 13.3 presents the impacts on the volume of outputs, exports and imports by broad sectors. The largest impact is observed in the agricultural sector with 8.5 percent rise in output and 25 percent rise in exports. However, imports in the agricultural sector would fall by 16.6 percent as domestic production would expand. There would be positive impacts on outputs and exports in both industrial and services sectors, with a larger effect in the former one.

Table 13.3: Effects on outputs, exports and imports (by broad sector) for crop productivity shock (% change from base)

Sectors	Output	Exports	Imports
Agriculture	8.5	25.2	-16.6
Industry	2.0	2.1	0.5
Services	1.3	1.3	1.9
All Sectors	2.7	2.2	-0.9

Source: Simulation in the Bangladesh CGE model

Disaggregated sectoral level impacts are presented in Table 13.4. The largest positive impact is observed in the 'Grain and Crops' sector, as output and export in this sector would increase by 11.8 and 28.9 percent respectively. There would be positive impacts in all other sectors, except the 'Utilities and Construction', due to sectoral inter-linkages and reallocation of factors. Among the other agricultural sub-sectors, the largest positive impact would be observed in 'Livestock and Meat Products'; among the industrial sub-sectors, both 'Processed Food' and 'Textiles and Clothing' sub-sectors' outputs would increase by 2.3 percent; among the services sub-sectors the largest positive impact would be observed in the case of 'Transport and Communication', which is primarily due to the larger linkage effect.

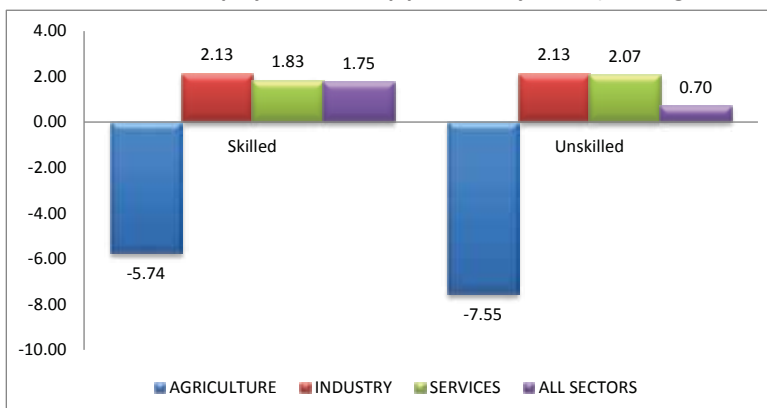
Table 13.4: Effects on outputs, exports and imports (by sectors) for crop productivity shock (% change from base)

Sectors	Output	Exports	Imports
Grains and Crops	11.8	28.9	-18.3
Livestock and Meat Products	4.3	10.8	-8.3
Mining and Extraction	1.2	2.0	-1.4
Processed Food	2.3	2.1	0.6
Textiles and Clothing	2.3	2.2	0.4
Light Manufacturing	1.5	1.1	1.0
Heavy Manufacturing	0.9	0.7	0.5
Utilities and Construction	-0.5	-	-
Transport and Communication	2.5	1.4	2.5
Other Services	1.6	0.9	1.6
Total	2.7	2.2	-0.9

Source: Simulation in the Bangladesh CGE model

Figure 13.2 presents the employment effect of the crop productivity shock. Due to the rise in the productivity in the crop sector, labor (both skilled and unskilled) would be released from the agricultural sector and would be reallocated to the industrial and services sectors. At the aggregate level, there would be positive impact on employment as employment of both skilled and unskilled labor would increase by 1.75 and 0.7 percent respectively.

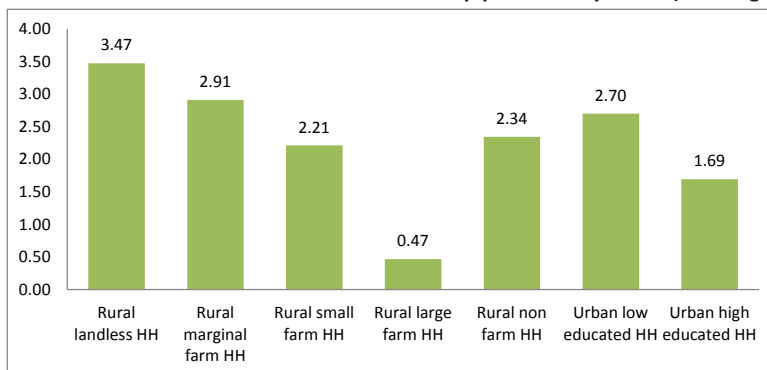
Figure 13.2: Effects on employment for crop productivity shock (% change from base)



Source: Simulation in the Bangladesh CGE model

Impacts on real incomes of representative household groups are presented in Figure 13.3. All household categories would experience rise in real income. In the rural area, the largest rise in real income would be observed for the 'rural landless households', and in the urban area the 'urban households with low-educated heads' would experience the largest rise. This suggests that such a positive productivity shock in crop agriculture would bring larger gains for the poorer households in Bangladesh.

Figure 13.3: Effects on households' real income for crop productivity shock (% change from base)



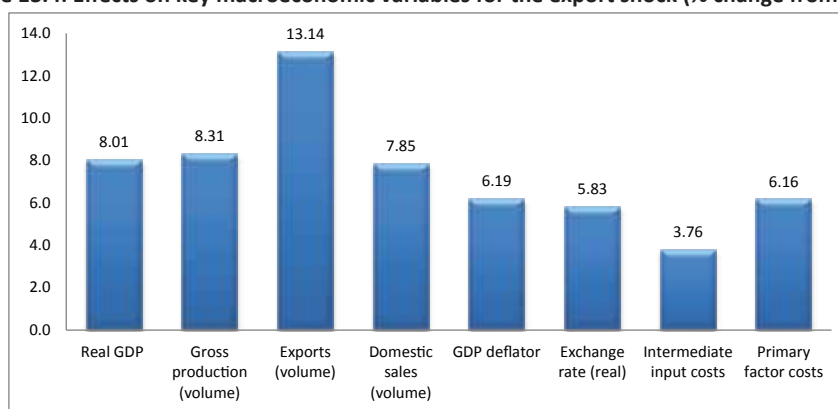
Source: Simulation in the Bangladesh CGE model

A rise in the demand for labor-intensive exports by 25 percent

This scenario considers a rise in the demand for labor-intensive exports by 25 percent. Under this scenario, a set of closure assumptions are imposed on the CGE model where total stocks of land, tax rates, technical changes, total real inventories, government savings and current account balance are exogenous, whereas total investment expenditure and total real government expenditures are held endogenous. Capital is mobile across sectors. Labor supply is flexible with fixed wage rates. The nominal exchange rate is the model's numéraire.

The macroeconomic effects of the export shock are presented in Figure 13.4. Such a positive export demand shock would lead to a rise in real GDP by 8 percent, whereas gross production and domestic sales would rise by 8.3 and 7.8 percent respectively. Total exports would increase by 13 percent. There would be an appreciation of the real exchange rate, and rise in GDP deflator, intermediate input costs and primary factor costs.

Figure 13.4: Effects on key macroeconomic variables for the export shock (% change from base)



Source: Simulation in the Bangladesh CGE model

Table 13.5 shows that the largest positive impacts on both the volume of outputs and exports would be observed in the industrial sector followed by services. As, 'Textiles and Clothing' is the largest labor intensive export sector in the country, such effects are quite logical.

Table 13.5: Effects on outputs, exports and imports (by broad sector) for export shock (% change from base)

Sectors	Output	Exports	Imports
Agriculture	4.3	1.5	20.5
Industry	9.7	14.1	13.7
Services	8.7	2.1	16.4
All Sectors	8.3	13.1	14.5

Source: Simulation in the Bangladesh CGE model

Table 13.6 provides the disaggregated sectoral level impacts. As expected, the largest positive impact would be observed in the 'Textiles and Clothing' sector followed by 'Light Manufacturing'. Among the agricultural sub-sectors, the largest positive impact is observed in 'Livestock and Meat Products'. Among the services sub-sectors the large positive impacts are observed in the cases of 'Other Services' and 'Transport and Communication', due to their large linkage effects with the export sectors.

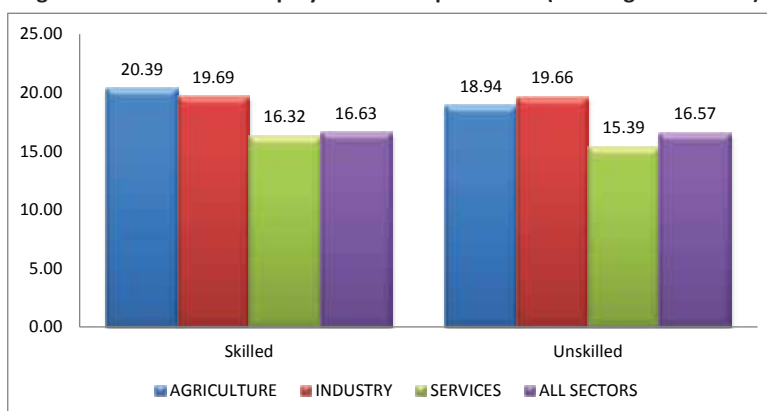
Table 13.6: Effects on outputs, exports and imports (by sector) for export shock (% change from base)

Sectors	Output	Exports	Imports
Grains and Crops	3.9	2.6	20.0
Livestock and Meat Products	5.1	4.2	19.8
Mining and Extraction	5.0	-6.5	25.2
Processed Food	9.4	12.6	16.7
Textiles and Clothing	11.7	14.4	14.2
Light Manufacturing	7.2	10.6	15.7
Heavy Manufacturing	1.3	-4.4	12.2
Utilities and Construction	6.3	-	-
Transport and Communication	9.1	2.1	15.0
Other Services	10.2	1.9	17.3
Total	8.3	13.1	14.5

Source: Simulation in the Bangladesh CGE model

The employment effects of the export shock are presented in Figure 13.5. Due to the rise in the demand for labor in the labor-intensive export sectors, there would be a large rise in employments of both skilled and unskilled labor in all three broad sectors. In the case of skilled labor, agriculture would appear to experience the largest rise in employment, whereas, in the case of unskilled labor, industry would have the largest rise. As 'Textiles and Clothing' is the largest employer for unskilled labor in the labor-intensive export sector, such a pattern of impacts would be compelling.

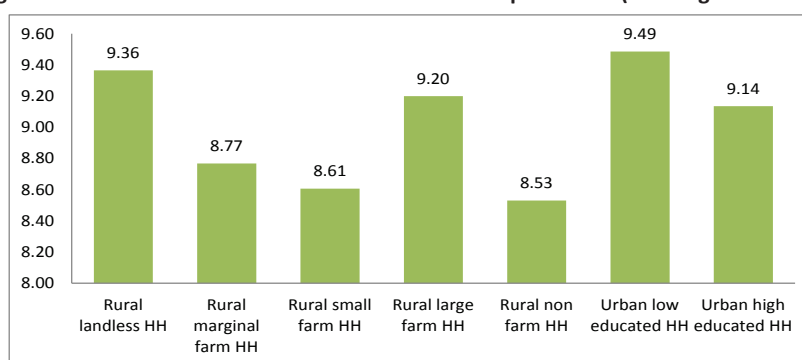
Figure 13.5: Effects on employment for export shock (% change from base)



Source: Simulation in the Bangladesh CGE model

Figure 13.6 suggests that real incomes of all representative household groups would rise with much larger effects being observed for the poorer household groups compared to their counterparts. In the rural area, the largest rise in real income would be observed for the 'rural landless households', and in the urban area the 'urban households with low-educated heads' would experience the largest rise. This suggests that such a positive export shock in the labor-intensive sectors would bring larger gains for the poorer households in Bangladesh.

Figure 13.6: Effects on household's real income for export shock (% change from base)



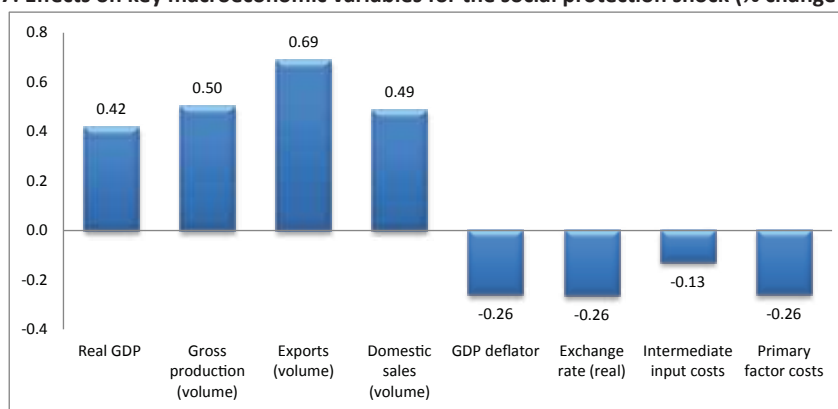
Source: Simulation in the Bangladesh CGE model

Doubling the allocation of social protection to households

This scenario considers doubling the current allocation of social protection to households. Under this scenario, a set of closure assumptions are imposed on the CGE model where total stocks of land, tax rates, technical changes, total real inventories, total real government expenditures and current account balance are exogenous, whereas total investment expenditure and government savings are held endogenous. Capital is mobile across sectors. Labor supply is flexible with fixed wage rates. The nominal exchange rate is the model's numéraire.

The macroeconomic effects of the social protection shock are presented in Figure 13.7. Such a rise in the allocation for social protection would not have large macroeconomic effects, as real GDP, gross production, exports and domestic sales would rise by very small margins. Furthermore, there would be some very small depressing effects on GDP deflator, real exchange rate, intermediate input costs and primary factor costs.

Figure 13.7: Effects on key macroeconomic variables for the social protection shock (% change from base)



Source: Simulation in the Bangladesh CGE model

Also, at the broad sectoral level, the effects on output and exports would be positive but small. Table 13.7 shows that the largest positive impacts on both the volume of outputs and exports would be observed in the industrial sector. As social protection increases poor people's purchasing power, import demand for agricultural products would rise.

Table 13.7: Effects on outputs, exports and imports (by broad sector) for social protection shock (% change from base)

Sectors	Output	Exports	Imports
Agriculture	1.0	0.6	1.4
Industry	1.1	0.7	-0.1
Services	0.0	1.0	1.1
All Sectors	0.5	0.7	0.2

Source: Simulation in the Bangladesh CGE model

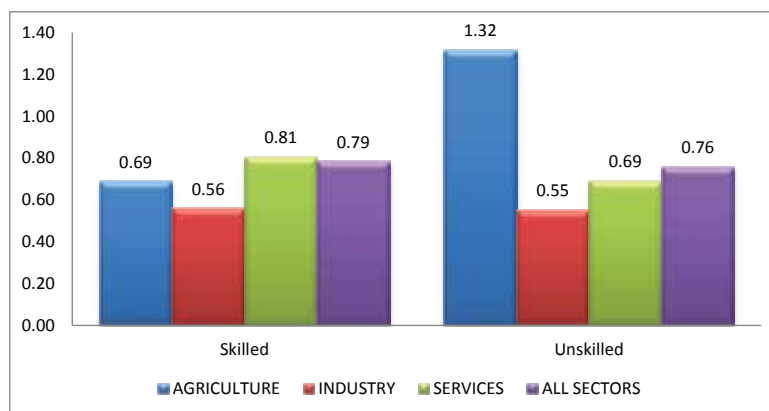
Disaggregated sectoral level impacts are presented in Table 13.8. Among the agricultural sub-sectors, both 'Grains and Crops' and 'Livestock and Meat Products' would experience the largest expansion, and among the industrial sub-sectors, the largest positive impact on output would be observed in the case of 'Processed Food'. This is primarily due to the increased demand for cereal and processed food products from the poorer households as their incomes would rise due to larger allocation of social protection.

Table 13.8: Effects on outputs, exports and imports (by sector) for social protection shock (% change from base)

Sectors	Output	Exports	Imports
Grains and Crops	1.4	0.7	1.5
Livestock and Meat Products	1.4	0.6	1.7
Mining and Extraction	-0.3	0.0	-0.6
Processed Food	2.4	1.4	2.1
Textiles and Clothing	1.1	0.7	1.4
Light Manufacturing	1.0	0.7	0.6
Heavy Manufacturing	-0.9	-0.2	-1.5
Utilities and Construction	-3.9	-	-
Transport and Communication	1.4	1.0	1.2
Other Services	1.5	1.0	1.1
Total	0.5	0.7	0.2

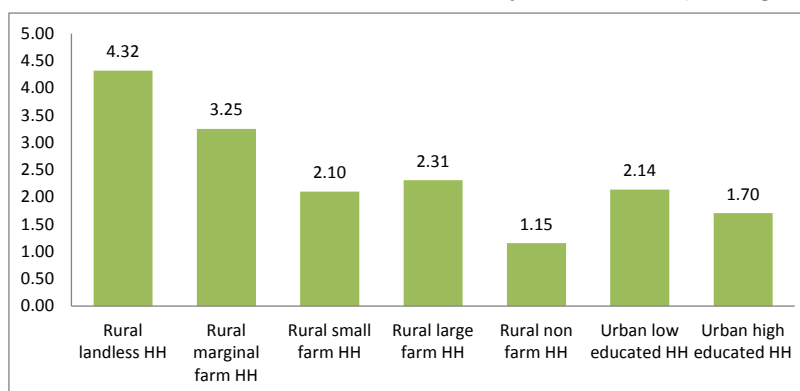
Source: Simulation in the Bangladesh CGE model

There would be some positive but small employment effects of the social protection shock (Figure 13.8). Employments of both skilled and unskilled labor would rise in all three broad sectors. In the case of skilled labor, service sector would appear to experience the largest rise in employment, whereas, in the case of unskilled labor, agriculture would have the largest rise.

Figure 13.8: Effects on employment for social protection shock (% change from base)

Source: Simulation in the Bangladesh CGE model

Figure 13.9 suggests that real incomes of all representative household groups would rise with much larger effects being observed for the poorer household groups, both in the rural and urban areas, compared to their counterparts. This is largely due to the fact that social protection programs are targeted primarily towards the poorer households. ‘Rural landless households’, and ‘urban households with low-educated heads’ would be the largest gainers in the rural and urban areas respectively.

Figure 13.9: Effects on households’ real income for social protection shock (% change from base)

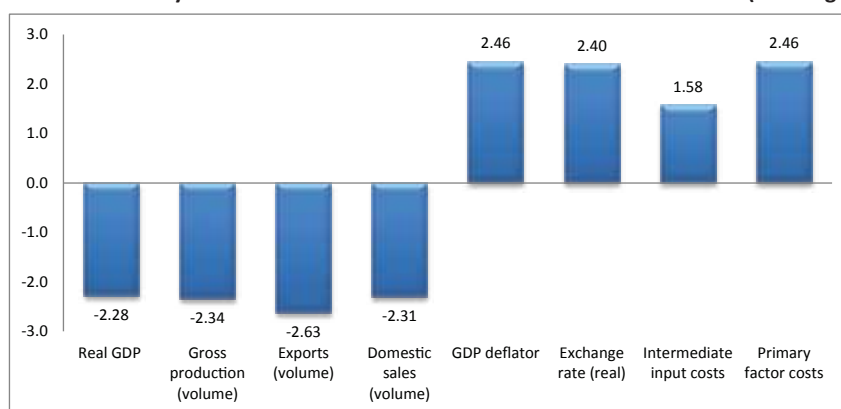
Source: Simulation in the Bangladesh CGE model

A natural disaster shock where the economy’s capital stock falls by 5 percent

This scenario considers a natural disaster shock (brought about by any earthquake, flood, cyclone or any other natural calamities) where the economy’s capital stock falls by 5 percent. Under this scenario, a set of closure assumptions are imposed on the CGE model where total stocks of land, tax rates, technical changes, total real inventories, government savings and current account balance are exogenous, whereas total investment expenditure and total real government expenditures are held endogenous. Capital is mobile across sectors. Labor supply is flexible with fixed wage rates. The nominal exchange rate is the model’s numéraire.

The macroeconomic effects of the disaster shock are presented in Figure 13.10. It appears that such a scenario would lead to 2.28 percent fall in the real GDP. The impacts on gross production and domestic sales would also be negative with similar magnitudes. There would be an appreciation in the real exchange rate, and rise in GDP deflator, intermediate input costs and primary factor costs. These would lead to a fall in exports by 2.63 percent.

Figure 13.10: Effects on key macroeconomic variables for the natural disaster shock (% change from base)



Source: Simulation in the Bangladesh CGE model

Table 13.9 presents the impacts on the volume of outputs, exports and imports by broad sectors. The largest negative impact would be observed in the agricultural sector with 2.7 percent fall in output and 5.2 percent fall in exports. This would lead to a rise in agricultural imports by 3.8 percent. There would be negative impacts on outputs and exports in both industrial and services sectors, with a larger effect in the industrial sector.

Table 13.9: Effects on outputs, exports and imports (by broad sector) for the natural disaster shock (% change from base)

Sectors	Output	Exports	Imports
Agriculture	-2.7	-5.2	3.8
Industry	-2.5	-2.6	-0.1
Services	-2.1	-2.3	0.3
All Sectors	-2.3	-2.6	0.3

Source: Simulation in the Bangladesh CGE model

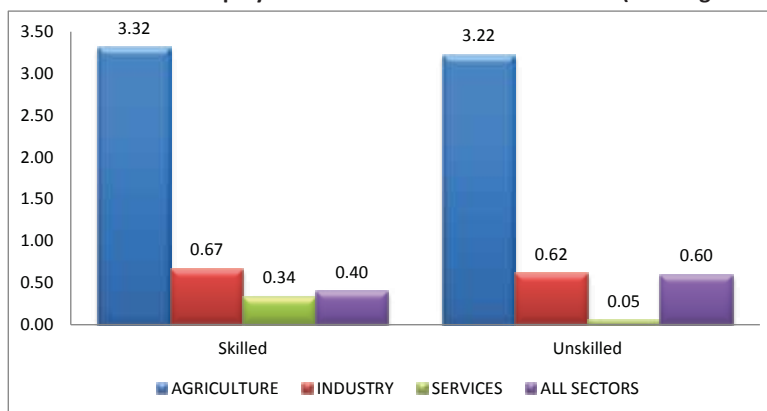
We observe from the disaggregated sectoral level impacts, presented in Table 13.10, that all sectors would experience fall in outputs and exports, with the largest negative impact on output being observed in the 'Heavy Manufacturing' followed by 'Mining and Extraction'. Imports in all agricultural sectors would increase in much larger magnitudes than those for industrial and services sub-sectors, primarily due to meeting households' basic food needs.

Table 13.10: Effects on outputs, exports and imports (by sector) for the natural disaster shock (% change from base)

Sectors	Output	Exports	Imports
Grains and Crops	-2.6	-5.2	3.8
Livestock and Meat Products	-1.8	-4.5	4.1
Mining and Extraction	-3.2	-5.4	4.2
Processed Food	-1.8	-2.3	0.8
Textiles and Clothing	-2.5	-2.6	0.3
Light Manufacturing	-2.7	-3.1	0.4
Heavy Manufacturing	-4.4	-4.3	-0.6
Utilities and Construction	-2.3	-	-
Transport and Communication	-2.2	-2.3	-0.3
Other Services	-1.8	-2.4	0.6
Total	-2.3	-2.6	0.3

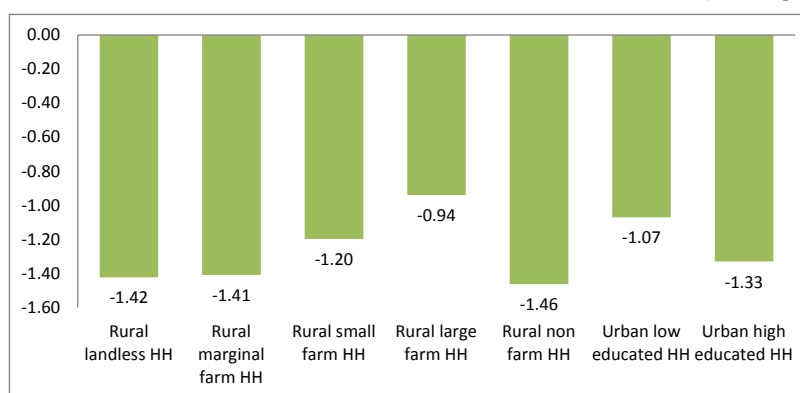
Source: Simulation in the Bangladesh CGE model

Figure 13.11 presents very interesting employment effect of the natural disaster shock. Due to the fall in capital stock, demand for labor (both skilled and unskilled) would increase by small margins. This is primarily due to the effect stemming from some degrees of substitution between labor and capital. Employments in agriculture would rise by some sizeable magnitudes, while those in industry and services would rise very small margins. This suggest that such a natural disaster shock would reverse the structural change in employment in Bangladesh where labor is expected to be released from agriculture for being absorbed in the industrial and services sectors.

Figure 13.11: Effects on employment for the natural disaster shock (% change from base)

Source: Simulation in the Bangladesh CGE model

All household categories would experience fall in their real incomes (Figure 13.12). In the rural area, the largest fall in real income would be observed for the 'rural nonfarm households' as this household has the largest share in capital stock in the rural area. For the same reason, in the urban area the 'urban households with high-educated heads' would experience the largest fall. However, negative impacts on poorer household groups would also be quite large.

Figure 13.12: Effects on household's real income for the natural disaster shock (% change from base)

Source: Simulation in the Bangladesh CGE model

Conclusion

This paper presents a CGE model for Bangladesh for the analysis of economy-wide and employment effects of different policy and natural disaster scenarios. These include a rise in crop productivity, a rise in the demand for labor-intensive exports, a rise in the allocation for social protection to households, and a natural disaster shock. This paper provides a description of the CGE model, the social accounting matrix of the Bangladesh economy for the year 2012, and a detailed analysis of the results of four simulations. The simulation results suggest that rise in crop productivity and export demand of labor-intensive sectors can have large positive impacts in the economy in terms of rise in real GDP, exports, employment and real incomes of the households, with poorer households gaining larger than their counterparts. However, a natural disaster shock can bring depressing effect on real GDP, exports and real incomes of the households with a risk of reversing the structural change in employment. Finally, even though a rise in the allocation for social protection would have small macroeconomic and sectoral impacts, poorer households, both in the rural and urban areas, would gain significantly due to the increase in their real incomes.

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Editor



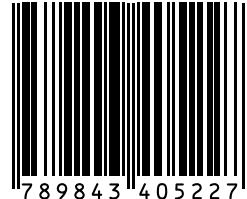
Dr. Selim Raihan is a Professor at the Department of Economics, University of Dhaka and the Executive Director of the South Asian Network on Economic Modeling (SANEM). He holds a PhD from the University of Manchester, UK. Dr. Raihan possesses vast expertise in research on international trade, labour market dynamics, poverty, economic growth and political economy analysis of growth and development. He has a long experience in teaching international trade, economic modeling, quantitative economics, econometrics, development economics and poverty dynamics at the University of Dhaka. He is the editor of a monthly digest *Thinking Aloud*, published from SANEM. Dr. Raihan has a number of publications in reputed journals, and has also written several books and book-chapters published by reputed publishers in London, New York, New Delhi and Dhaka. Dr. Raihan has worked for several national and international organizations including the Asian Development Bank, the World Bank, UNDP, UNESCAP, UNCTAD, IFPRI, the Commonwealth Secretariat, FAO, European Commission, ILO, IDRC, DFID, etc.



Bangladesh has experienced remarkable economic growth rates over the last decade. The country has recently been upgraded from low income country (LIC) to lower-middle income country (LMIC) as per World Bank's classification. There is an aspiration of graduating from the LDC status to middle income country by 2021 as per the United Nations' classification. The 7th five year plan sets an ambitious target of 8 percent GDP growth rate by 2020. This requires an enormous leap forward from the current level of 6 percent average growth rate. The situation also demands for a considerable structural change in the economy facilitating towards a large scale economic diversification. Rapid expansion of labor-intensive and high-productivity sectors, both in the farm and nonfarm, is thus crucial for Bangladesh. This should be in conjunction with interventions to enhance productivity, jobs and incomes in traditional and informal activities where there are large pools of surplus labor. Given the background, South Asian Network on Economic Modeling (SANEM) is delighted to publish this pioneering volume titled ***Structural Change and Dynamics of Labor Markets in Bangladesh: Studies on Labor and Employment***



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