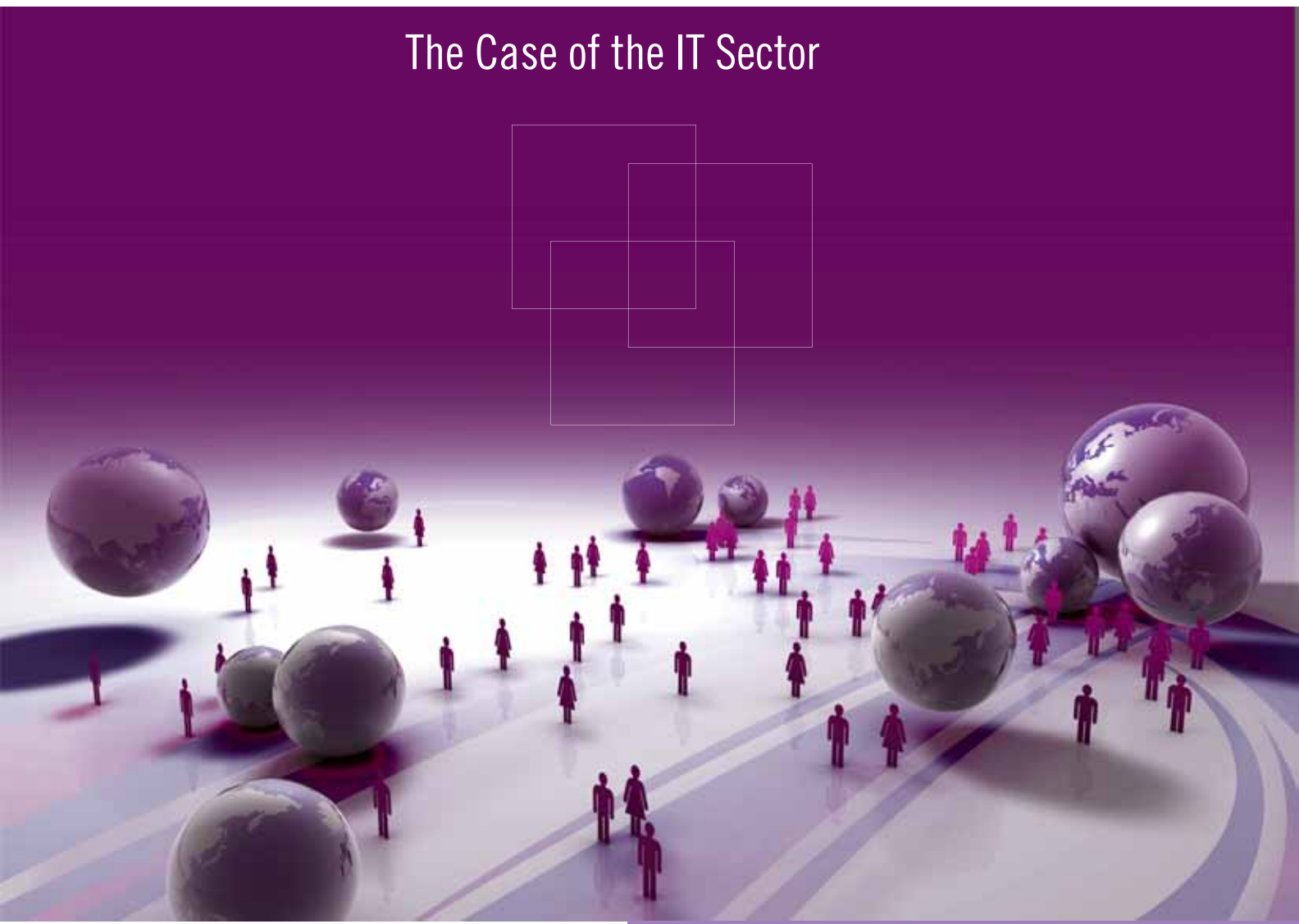
International Labour Organization

IMPACT OF TRADE IN SERVICES ON EMPLOYMENT IN BANGLADESH

The Case of the IT Sector



Selim Raihan and David Cheong

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FOREWORD

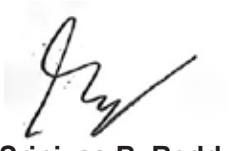
Trade liberalization and foreign investment can influence growth, employment, and poverty both positively and negatively. It is widely believed that trade promises new and better jobs. However, experience has shown that the countries that have the skills, resources, and supportive trade and labour market policies can benefit greatly from globalization, and can also minimize the negative effects of it. Bangladesh has been increasingly integrating with the global economy as the country's liberalization commitment increases. Therefore, the effects of international trade, either in goods or in services, on the labour market (in terms of job creation, wages, and labour rights) is of great interest, as well as concern, for Bangladesh.

In today's global economy, the services sector has become increasingly tradeable as a result of rapid advances in Information Technology (IT). In Bangladesh, IT is a service activity whose trade has the potential to bring prosperity to the country. Thus, the government is trying to optimize services trade in the field of IT. The government has declared IT as a thrust sector and embarked on multipronged initiatives to give this industry a jump start. However, the country still faces several challenges in developing the IT sector and expanding IT-related trade. The skills of the labour force in Bangladesh's IT sector are not up to the required level. Enhancement of productivity and competitiveness of IT enterprises remains an issue.

This report explores the impact and potential of the rise of Bangladesh's IT exports, its linkages with employment and policies, and actions required for realizing that potential. It uses both qualitative and quantitative techniques. The qualitative techniques include an analysis of a database created from a survey of 300 IT firms in Bangladesh and responses from several interviews of stakeholders. The quantitative techniques use national accounts, labour force, and export and import data in simulation exercises. The report underlines the need for Bangladesh to consider policy measures for the enhancement of productivity and the competitiveness of IT enterprises. The report also emphasizes complementary policies such as skills training, amendment of different laws to facilitate online payment systems, education sector reforms, etc.

This publication is an outcome of a European Union funded project, which is being implemented by the International Labour Organization (ILO), entitled "Assessing and Addressing the Effects of Trade on Employment (ETE)". This project aims to provide its constituents with capacity building, sound research evidence, and a platform for discussion and formulation of national policies related to trade and employment. We believe that the findings of this report will be of great interest to all, particularly policymakers and the social partners in Bangladesh, who are concerned about the challenges that developing countries face in a globalized world.

I would like to thank Dr. Selim Raihan and Dr. David Cheong for conducting this study. We hope that this report will generate useful discussions and contribute to policy reforms for inclusive and job-rich growth in Bangladesh.



Srinivas B. Reddy

Country Director
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All errors and omissions remain the responsibility of the authors.

SUMMARY

Bangladesh's IT subsector has grown from a negligible size industry to one that was worth USD 350 million in annual revenues in 2009, with software exports nearly trebling from a little less than USD 13 million in 2005 to USD 35 million in 2009 and further to USD 47.3 million in 2011. IT and non-voice IT-enabled services constitute the bulk of these exports. A variety of factors have contributed to the rapid growth of this industry. This study explores the impact of the rise in export of IT services on employment in Bangladesh.

The country has benefited from its large number of English speakers and pool of graduates, with their well-established delivery capabilities. There are also specialized training institutes producing IT graduates. Bangladesh thus scores favourably on labour costs. The sector has also benefited from growing teledensity, rising internet penetration, falling bandwidth costs, and a growing and maturing market for telecom services. The rapid growth in freelance outsourcing has been driven by the ease of setting up operations, growing internet penetration, and limited infrastructure requirements. The government of Bangladesh has also taken up several policies towards the development of public ICT projects. The government has also clearly mentioned its vision of e-governance and promotion of the ICT sector in the Sixth Five Year Plan.

The simulation exercises using a CGE model suggest that under different scenarios relating to IT export growth there will be positive impacts at the macro, sectoral, and household levels. It also appears that a positive export shock in the IT sector would lead to a rise in employment not only in the IT sector, but also in all other sectors in the economy and indirect employment generation would be much higher than direct employment generation.

Although the IT sector of Bangladesh has almost all the necessary ingredients for success, according to industry stakeholders, there remain some perceived threats for the industry. Despite the cost advantages and availability of IT education, according to many stakeholders, the skills of the labour force in Bangladesh's IT sector are not up to the required level. This is due to the lack of an updated curriculum, inadequately trained teachers, and a lack of adequate facilities in relevant institutions. The stakeholders also perceived a lack of finance as one of the major obstacles for Bangladeshi entrepreneurs in the IT sector. According to the stakeholders, there are also emerging human resource constraints in this sector. Although the country's IT policy is favourable, Bangladesh may face a big 'resource crunch' in the near future on account of the brain drain and the growing attractiveness of other business sectors, which are pulling away professionals and thus reducing the number of professionals who pursue an IT career. There are also physical infrastructural constraints, chief among which is the lack of availability of continuous power supply. Also there is little coordination between policy making and the implementation of IT-related activities, which are carried out by a number of government entities. This acts as a barrier in carrying out the Master plan of building a Digital Bangladesh.

The stakeholders highlighted a need for the formulation of a universal access policy and broad-band policy for ensuring equity in IT-based growth and development. To implement this policy, details of the relevant rules such as the Patent Law, Secrecy Act, Consumer Protection Act, Trade Mark Act, Foreign Exchange Regulation Act, and Income Tax Act should be taken into consideration so that there is no infringement of rights or violation of existing rules when implementing the IT Policy.

In general, the Bangladeshi workforce lacks in English language proficiency and there is room for improvement. Therefore, there is a critical need to train the existing labour force. Training courses should be upgraded to reflect advanced technology.

The stakeholders stressed the importance of advertising more vigorously the existing incentives, including fiscal and financial incentives for attracting local investment and FDI in IT through the PPP (Public-Private Partnership) initiative. The major focus of the country needs to be on export promotion. IT firms should focus more on marketing activities such as commercial representation, networking, and advertising.

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ACRONYMS

APS	Average propensities to spend
BACCO	Bangladesh Call Centre and Outsourcing
BASIS	Bangladesh Association of Software Information Services
BCC	Bangladesh Computer Council
BPO	Business process outsourcing
BTRC	Bangladesh Telecommunications Regulatory Commission
CES	Constant elasticity of substitution
CET	Constant elasticity of transformation
CGE	Computable General Equilibrium
GATS	General Agreement on Trade in Services
GDP	Gross domestic product
GFCF	Gross fixed capital formation
HTP	High Tech Park
IBPC	ICT Business Promotion Council
IPTV	Internet Protocol TV
IT	Information Technology
ITC	International Trade Centre
ITeS	IT-enabled services
MoI	Ministry of Post and Telecommunications (MoPT) and Ministry of Information
PC	Planning Commission
PMO	Prime Minister's Office
RMG	Readymade garments
SAM	Social Accounting Matrix
SICT	Support to Information and the Communication Technology
WTO	World Trade Organisation

I. INTRODUCTION

In the present day, the services sector is the fastest growing sector in the global economy and it accounts for two thirds of global output, 30 per cent of global employment, and 20 per cent of global trade. Services activities in low- and middle-income countries have been expanding faster than the gross domestic product (GDP) for the last two decades. An implication of this continuous shift toward services is that the overall growth of productivity in the economy is becoming increasingly determined by what is happening in the services sector.

Even though the services sector is the major contributor to GDP in most countries, trade in services is a relatively new phenomenon, and it has a low share in the total world trade. 'Intangibility' and 'no storability' characteristics of services were considered as main impediments to services trade. The services sector was not included in the world trade negotiation process until the inception of the Uruguay Round. The commencement of General Agreement on Trade in Services (GATS) in world trade negotiations under the World Trade Organization (WTO) is the first initiative with the aim of progressive liberalisation of trade in services.

In the era of global economic integration, competitiveness plays a vital role in the success of international trade. In addition, the competitive environment of the domestic markets facilitates higher economic growth and can help in reducing poverty. The services sector plays a fundamental role in ensuring the competitiveness of an economy.

Over the past thirty years the Bangladesh economy has significantly liberalised its trade regime and has turned into a trade-dependent economy. During the course of the overall trade liberalisation programme, the liberalisation of service sectors also received much importance. Service sectors are increasingly becoming the core of the Bangladesh economy. Among the services sectors, Information Technology (IT) is an important sector in Bangladesh.

The broad objective of the study is to explore the impact of the rise in IT services exports on employment in Bangladesh. The study provides an overview of the trade and employment situations in the services sector in Bangladesh and analyses the link between the expansion of trade in the IT sector and employment in the IT sector in Bangladesh. The study also explores the economy-wide effects of such expansion of trade in the IT sector. The study highlights a set of policy recommendations for the future development of the IT sector in Bangladesh.

The analysis of this paper has been organized into eight sections. After the Introduction in Section I, Section II provides a brief description of the methodology of the study. Section III presents an overview of the structure of the Bangladesh economy. Section IV presents an overview of the services sector in Bangladesh. Section V submits an overview of the IT services sector in Bangladesh. Section VI presents the simulation results using the Computable General Equilibrium (CGE) model. Section VII highlights the findings from the stakeholder consultations and finally Section VIII presents the policy recommendations and conclusions.

2. METHODOLOGY

The study uses both quantitative and qualitative techniques to answer research questions. The study has conducted several interviews with stakeholders. These help identify major hindrances to the rise in exports of IT from Bangladesh, the actual potentials of the rise in exports, and the policies and actions required for realising that potential. The assessment of the potential rise in IT exports from Bangladesh, as perceived from the analysis of secondary data and interviews with IT firms, is then linked to the simulation exercises. The study uses a CGE model to explore the macro, sectoral, and welfare effects of different simulation scenarios.

2.1. The CGE Model for the Bangladesh Economy

The Bangladesh CGE model is built using the PEP standard static model.[1] In the Bangladesh CGE model, representative firms in each industry maximize profits subject to their production technology. The sectoral output follows a Leontief production function. Each industry's value added consists of composite labour and composite capital, following a constant elasticity of substitution (CES) specification. Different categories of labour are combined following a CES technology with imperfect substitutability between different types of labour. 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 labour income, capital income, and transfers received from other agents. Subtracting direct taxes yields households' 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.

[1] See www.pep-net.org

Producers' supply behaviour is represented by nested constant elasticity of transformation (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/her share of the world market only by offering a price that is advantageous relative to the (exogenous) world price. The ease with which his/her 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 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 be equilibrium between the supply and demand of each commodity on the domestic market. 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. Also, there is equilibrium between total demand for capital and its available supply. However, the model assumes flexible supplies of both unskilled and skilled labour.

3. THE SOCIAL ACCOUNTING MATRIX (SAM) AND THE STRUCTURE OF THE BANGLADESH ECONOMY

This study uses the latest available SAM of Bangladesh for the year 2007. The 2007 SAM identifies the economic relations through four types of accounts: (i) production activity and commodity accounts for 41 sectors; (ii) 4 factors of productions with 2 different types of labour and 2 types of capital; (iii) current account transactions between 4 main institutional agents-household-members and unincorporated capital, corporation, government, and the rest of the world; and (iv) one consolidated capital account. The 2007 SAM originally has 86 sectors which have been aggregated to 41 sectors. The mapping is provided in Annex 1. The disaggregation of activities, commodities, factors, and institutions in the 41-sector SAM is given in the Table 1.

Table 1: Disaggregation and Description of Bangladesh SAM Accounts

Set	Description of Elements
Commodities (41)	
Agriculture (6)	Cereal Crop; Commercial Crop; Livestock Rearing; Poultry Rearing; Fishing; and Forestry
Manufacturing (22)	Rice Milling; Grain Milling; Food products; Leather Industry; Yarn Industry; Cloth Industry; Woven RMG; Knit RMG; Toiletries; Cigarette and Bidi Industry; Furniture Industry; Paper, Printing and Publishing industry; Pharmaceuticals; Fertiliser Industry; Petroleum; Chemical Industry; Glass Industry; Earth-ware Industry; Cement; Metal Industry; Miscellaneous Industry; Mining and Quarrying
Services (13)	Construction; Electricity and Water Generation; Gas Extraction and Distribution; Wholesale and Retail Trade; Transport; Health Service; Education Service; Public Administration and Defence; Bank Insurance and Real estate; Hotel and Restaurant; Communication; Information Technology and E-Communication; and Other Services
Factors of Production (4)	
Labour (2)	Labour Unskilled and Labour Skilled
Capital (2)	Capital and Land
Current Institutions (11)	
Households (7)	Rural: landless, Agricultural marginal, Agricultural small, Agricultural large, Non-farm Urban: Households with low educated heads, and households with high educated heads
Others (3)	Government, Corporation and Rest of the World
Capital Institution (1)	
Consolidated Capital Account	

Source: The Bangladesh SAM 2007

The structure of the Bangladesh economy, as reflected in the SAM 2007, is briefly presented in Table 2. Column 1 shows the shares of sectoral value added in total value added. The share of agriculture in total valued added is 19.88 per cent with cereal and commercial crops as the leading sub-sectors. The share of industry is 18 per cent and the sub-sectors with high shares are rice milling, woven readymade garments (woven RMG), and knit readymade garments (knit RMG). The share of the services sector (including construction) is 62.12 per cent and the leading services sub-sectors are wholesale and retail trade, construction, and other services. The share of Information Technology and E-Commerce (IT) is only 0.07 per cent.

Table 2: Structure of the Bangladesh Economy in 2007 as reflected in SAM 2007

	1	2	3	4	5	6
Sectors	**Vi/TV**	**Ei/Oi**	**Ei/TE**	**Mi/Oi**	**Mi/TM**	**TAR**
Cereal Crop sectors	7.44	0.00	0.00	4.91	2.44	6.33
Commercial crops	4.53	2.73	1.13	26.03	7.56	5.53
Livestock Rearing	1.45	0.01	0.00	0.01	0.00	6.78
Poultry Rearing	0.90	0.00	0.00	0.58	0.06	15.09
Fishing	4.03	9.77	5.11	0.07	0.03	33.35
Forestry	1.54	0.00	0.00	0.00	0.00	0.00
Agriculture	**19.88**		**6.47**		**10.00**	
Rice Milling	3.09	0.03	0.02	1.22	0.70	6.23
Grain Milling	0.36	0.08	0.01	0.11	0.01	24.28
Food Process	1.24	0.93	0.36	29.58	8.07	12.07
Leather Industry	0.39	23.42	1.73	4.45	0.23	11.74
Yarn	0.03	42.21	0.38	508.65	3.18	18.23
Cloth milling	1.72	0.00	0.00	17.97	3.79	27.43
Woven RMG	2.39	91.71	37.61	11.68	3.36	21.27
Knitting	3.26	90.49	36.37	1.29	0.36	1.17
Toiletries	0.00	5.92	0.02	166.71	0.32	31.97
Cigarette Industry	0.09	1.79	0.10	2.49	0.10	30.40
Furniture Industry	0.21	28.38	1.13	31.16	0.87	16.31
Paper, printing and publishing Industry	0.06	4.99	0.05	209.81	1.51	20.76
Pharmaceuticals	0.34	2.22	0.15	20.03	0.96	2.05
Fertilizer Industry	0.05	42.01	0.31	328.09	1.71	4.04
Petroleum	0.05	14.14	0.43	654.70	13.91	16.63
Chemical Industry	0.11	12.04	0.28	395.22	6.49	14.62
Glass Industry	0.04	5.86	0.05	33.97	0.20	21.03
Earth-ware and clay industry	0.19	0.06	0.00	14.46	0.31	7.22
Cement	0.16	0.28	0.02	6.70	0.39	11.07
Metal	0.96	3.38	0.76	16.10	2.53	14.12
Miscellaneous Industry	2.08	25.20	6.87	145.63	27.89	14.40
Mining and Quarrying	1.19	0.06	0.01	0.52	0.05	20.12
Industry	**18.00**		**86.43**		**76.32**	
Construction	8.42	0.00	0.00	0.00	0.00	0.00
Electricity and Water Generation	0.89	0.00	0.00	0.00	0.00	0.00
Gas Extraction and Distribution	0.28	0.00	0.00	0.00	0.00	0.00
Wholesale and retail trade	14.63	0.00	0.00	0.00	0.00	0.00
Transport	9.44	1.32	0.83	18.46	8.20	0.00
Health Service	2.30	0.00	0.00	0.00	0.00	0.00
Education Service	2.63	0.00	0.00	0.00	0.00	0.00
Public Administration and Defence	2.84	21.32	5.08	13.27	2.22	0.00
Bank Insurance and Real estate	1.63	1.29	0.16	15.41	1.35	0.00
Hotel and Restaurant	0.70	0.00	0.00	0.00	0.00	0.00
Communication	1.32	3.34	0.32	2.29	0.16	0.00
Information Technology and E-Commerce	0.07	29.65	0.16	7.57	0.03	0.00
Other Services	16.98	0.49	0.54	1.33	1.03	0.00
Services	**62.12**		**7.11**		**13.68**	
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 percentage
Source: The Bangladesh SAM 2007

Column 2 of Table 2 shows export orientation by sector. The woven and knit RMG sectors are more than 80 per cent export-oriented. The other major export-oriented sectors are jute, leather, IT, public administration and defence, fishing, and the furniture and fertiliser industries.

Bangladesh's export basket is highly concentrated as is evident from the fact that around 74 per cent of total exports comes from woven and knit RMG (Column 3 of Table 2). The share of fishing is 5.3 per cent. Leather and miscellaneous industries constitute 1.7 and 6.9 per cent of total exports, respectively. In the services sectors, public administration and defence constitute 5 per cent of total exports and the IT sector has a very low share, only 0.16 per cent.

Table 3: Sectoral Employment Numbers and Shares from the Employment Satellite Matrix

Sectors	Number		% Share in Total		% Share in Total (UL+SL)
	UL	SL	UL	SL	
Cereal Crop sectors	13165730	9270	29.91	0.28	27.83
Commercial crops	3239420	1580	7.36	0.05	6.85
Livestock Rearing	2077557	356443	4.72	10.70	5.14
Poultry Rearing	1562291	238709	3.55	7.17	3.80
Fishing	943285	151715	2.14	4.56	2.31
Forestry	423142	76858	0.96	2.31	1.06
Agriculture	**21411425**	**834575**	**48.65**	**25.06**	**46.99**
Rice Milling	248550	450	0.56	0.01	0.53
Grain Milling	10590	3910	0.02	0.12	0.03
Food Process	245770	21130	0.56	0.63	0.56
Leather Industry	91960	7040	0.21	0.21	0.21
Yarn	61420	6580	0.14	0.20	0.14
Cloth milling	650190	23810	1.48	0.72	1.42
Woven RMG	1008370	103630	2.29	3.11	2.35
Knitting	93170	4830	0.21	0.15	0.21
Toiletries	14990	2010	0.03	0.06	0.04
Cigarette Industry	121660	7340	0.28	0.22	0.27
Furniture Industry	946720	19280	2.15	0.58	2.04
Paper, printing and publishing Industry	89640	28360	0.20	0.85	0.25
Pharmaceuticals	54700	9300	0.12	0.28	0.14
Fertilizer Industry	38540	10460	0.09	0.31	0.10
Petroleum	7460	2540	0.02	0.08	0.02
Chemical Industry	113060	13940	0.26	0.42	0.27
Glass Industry	5700	2800	0.01	0.08	0.02
Earth-ware and clay industry	243920	3000	0.55	0.09	0.52
Cement	37100	2900	0.08	0.09	0.08
Metal	190540	29460	0.43	0.88	0.46
Miscellaneous Industry	615460	72540	1.40	2.18	1.45
Industry	**4892210**	**375810**	**11.12**	**11.29**	**11.13**
Construction	1453000	71000	3.30	2.13	3.22
Electricity and Water Generation	48510	11490	0.11	0.35	0.13
Gas Extraction and Distribution	4770	3230	0.01	0.10	0.02
Mining and Quarrying	2700	500	0.01	0.02	0.01
Wholesale and retail trade	7035780	72220	15.99	2.17	15.01
Transport	3316660	29540	7.54	0.89	7.07
Health Service	61920	272080	0.14	8.17	0.71
Education Service	247020	1058980	0.56	31.80	2.76
Public Administration and Defence	784890	96110	1.78	2.89	1.86
Bank Insurance and Real estate	291529	216471	0.66	6.50	1.07
Hotel and Restaurant	695680	16320	1.58	0.49	1.50
Communication	136380	1620	0.31	0.05	0.29
Information Technology and E-Commerce	4250	4750	0.01	0.14	0.02
Other Services	3626440	265560	8.24	7.98	8.22
Services	**17706829**	**2119371**	**40.23**	**63.65**	**41.88**
Total	**44010464**	**3329756**	**100.00**	**100.00**	**100.00**

Note: UL = unskilled labour; SL = skilled labour
Source: Employment Satellite Matrix (data from Labour Force Survey 2005-06)

Column 4 of Table 2 suggests that the major import-oriented sectors are chemical industry, petroleum, fertilizer industry, paper-printing and publishing industry, miscellaneous industry, toiletries, mill cloth, and yarn. According to Column 5, the sectors with high import shares are miscellaneous industry, petroleum, food process, and commercial crops. Finally, Column 6 presents the import tariff rates of the respective sectors. The leading protected sectors (the sectors with the high tariff rates) are fishing, toiletries, cigarette industry, cloth milling, grain milling, woven RMG, glass industry, paper, printing and publishing industry, mining and quarrying, yarn, petroleum, furniture industry, poultry rearing, chemical industry, miscellaneous industry, and metal. IT's import orientation is only 7.57 per cent and its share in total import is only 0.03 per cent.

Table 3 presents the structure of employment in the economy of Bangladesh. Despite the fact that the agricultural sector contributes less than 20 per cent to total value-added (Table 2), it constitutes nearly 47 per cent of the total employed labour force of the country. The shares of the industry and services sectors are 11.1 per cent and 41.9 per cent respectively. The IT sector employs 4,250 unskilled (0.01 per cent of total unskilled labour) and 4,750 skilled labour (0.14 per cent of total skilled labour).

4. AN OVERVIEW OF THE SERVICE SECTOR IN BANGLADESH

4.1. Service Sector and GDP

Economic development inevitably triggers a structural change in the composition of output in favour of services. One of the striking features of Bangladesh's growth performance during the last decade has been the strength of the services sector. During this period, the Bangladesh economy has been experiencing a significant structural change while the role of agriculture has been declining, while that of industry and services has been growing. Between 1980-81 and 2009-10, agriculture's contribution to GDP declined from 33 per cent to 20.3 per cent, while that of industry increased from 17.3 per cent to 29.9 per cent. During this period, services sector contributed around 50 per cent of Bangladesh's GDP (Table 4).

Table 4: Share of Service Sectors to GDP and Its Dynamics (at 1995-96 constant prices)

Contribution (% share in GDP)											
Sectors	**1980-81**	**1985-86**	**1990-91**	**1995-96**	**2000-01**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**
Agriculture	33.07	31.15	29.23	25.68	25.03	22.27	21.84	21.11	20.83	20.48	20.29
Industry	17.31	19.13	21.04	24.87	26.20	28.31	29.03	29.77	29.70	29.86	29.93
Service	49.62	49.73	49.73	49.45	48.77	49.42	49.13	49.12	49.47	49.66	49.78
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Annual Average Growth Rate (%)											
Agriculture	3.31	3.31	2.23	3.10	3.14	2.21	4.94	3.18	3.21	4.12	5.24
Industry	5.13	6.72	4.57	6.98	7.45	8.28	9.74	9.51	6.78	6.46	6.49
Service	3.55	4.10	3.28	3.96	5.53	6.36	6.40	6.74	6.49	6.32	6.47
GDP Growth	3.74	3.34	3.24	4.47	5.41	5.93	6.63	6.51	6.19	5.74	6.07

Source: Bangladesh Economic Review (2011)

Table 4 also indicates that since 2004-05, the overall GDP of the economy has been increasing at a rate of around 6 per cent, which has been facilitated by high growth in industry and services sectors. During 2004-05 and 2009-10, the services sector in Bangladesh grew, on average, at a rate of 6.46 per cent per annum as against 6.18 per cent growth in overall GDP.

The rates of growth in some services sub-sectors have been higher than the growth in overall GDP.

Table 5: Sectoral Contribution to Growth rate in GDP in 2006-07

Industrial Origin Sector	Sectoral Share of GDP at Constant Prices in 2006-07	Sectoral Growth Rate of GDP at Constant Prices in 2006-07	Weights	Sectoral contribution to GDP Growth rate
Agriculture and Forestry	16.38	2.81	0.16	0.46
Fishing	4.73	3.99	0.05	0.19
Mining and Carriage	1.19	10.02	0.01	0.12
Large and Medium Scale Industry	12.68	11.03	0.13	1.40
Small Scale Industry	5.11	10.28	0.05	0.53
Construction	9.16	6.95	0.09	0.64
Electricity, Gas and Water Supply	1.63	5.37	0.02	0.09
Wholesale and Retail Trade	14.17	7.03	0.14	1.00
Hotel and Restaurants	0.7	7.15	0.01	0.05
Transport, Storage and Communication	10.21	7.04	0.10	0.72
Financial Intermediations	1.73	7.52	0.02	0.13
Real Estate, Renting and Business Activities	7.65	3.62	0.08	0.28
Public Administration and Defence	2.75	8.51	0.03	0.23
Education	2.54	8.81	0.03	0.22
Health and Social Services	2.29	7.56	0.02	0.17
Community, Social and Personal Services	7.08	4.41	0.07	0.31
Sub-total for Services Sectors	**59.91**			**3.84**
GDP at Constant Market Price	**100**	**6.51**	**1**	**6.51**

Data Source: BBS (2010)

Table 5 presents the figures of shares of different sub-sectors in GDP, as well as their contributions to the growth rate in GDP in 2006-07. It appears that in terms of the share in GDP the major sub-sectors in the services sector are 'wholesale and retail trade', 'transport, storage, and communication', 'real estate, renting, and business activity', and 'community, social, and personal works', and their respective contributions to GDP in 2006-07 are 14.17 per cent, 10.21 per cent, 7.65 per cent and 7.08 per cent. Among these services sub-sectors, 'wholesale and retail trade', and 'transport, storage, and communications' grew at rates faster than that of the overall services sector, as in 2006-07, these two sub-sectors grew by 7.03 and 7.04 per cent, respectively, while the services sector as a whole grew by 6.74 per cent. Another sub-sector where a high growth has been witnessed is the 'transport, storage and communication' sub-sector from where a major contribution to GDP comes and which shows linkages with production and external sectors. The transport head covers roads, railways, air transport, port and shipping services; but high growth in this sector is mainly because of strong growth posted by communications that comprises telecommunication, IT, and postal services. Robust growth momentums in the communication sector, as well as in the financial services have been triggered by liberalisation and reforms in these sectors. For example, a deregulation policy for the telecommunication sector and market-driven reforms have created a huge demand for new products which have been instrumental in attracting new foreign investment in this sub-sector. Finally, despite a low contribution to GDP,

'education' and 'community, social, and personal services' are also having high sectoral growth rates.

Table 5 also provides estimates of the sectoral contribution to the growth rate in GDP in 2006-07. It appears that services sectors, on average, recorded a growth rate of 6.74 per cent, and these sectors altogether contributed for more than half of the overall real GDP growth rate of Bangladesh. Among the services sub-sectors the largest contributions are made by 'wholesale and retail trade' and 'transport, storage, and communication' sub-sectors.

4.2. Share of Service Sector in Employment

Service sector employment has also shown a rising tendency but its contribution to total employment is much lower than its contribution to the country's GDP. Table 6 shows the sectoral composition of employment over the two decades. There was a sharp rise in the employment share of the agricultural sector in the eighties from 58.8 per cent in 1982-83 to 66.4 per cent in 1989-90. Since then the Bangladesh economy has been witnessing a declining trend in the employment share of agriculture. The share of agriculture in total employment reached to 48.07 per cent in 2005-06, which signifies the rise of non-farm activities during that period. On the other hand, the share of the manufacturing sector in total employment increased from 11 per cent in 1982-83 to 13 per cent in 1989-90, then declined to 9.6 per cent in 1995-96, and rose again to 14.5 per cent in 2005-06. The employment share of the service sector has been somewhat unstable during the last three decades. It declined from 24.2 per cent in 1982-83 to 16.2 per cent in 1989-90. During the late 1990s and early 2000s, when liberalisation of some services sectors occurred, like telecommunication and financial intermediaries, the employment share of the service sector grew substantially, reaching 37.4 per cent by 2005-06.

Table 6: Sectoral Composition of Employment (% employed workforce)

Year	Agriculture	Industry	Service
1982-83	58.8	11	24.2
1984-85	57.7	11.5	26
1989-90	66.4	13	16.2
1995-96	63.4	9.6	25
1996-97	63.2	9.5	27.3
1999-00	62.1	10.3	23.5
2002-03	51.7	13.7	34.6
2005-06	48.07	14.53	37.4

Source: Labour Force Surveys of BBS

Note: For 1982-83, 1984-85, 1989-90, 1995-96, and 1999-00 the shares of agriculture, industry and services do not add up to 100 per cent.

4.3. Service Sector and Trade

Bangladesh's services exports have doubled during 2005 and 2010, from USD1,249 million in 2005 to around USD2.4 billion in 2010 (Table 7). The contribution of traditional services, such as transport and travel, has declined, while that of other services, in particular communication, other business services, and, to some extent, computer and information services, has grown over this period. Government services, however, dominate, constituting almost half of other services exports. Thus the service export data for the past decade suggest that Bangladesh is increasingly moving towards new services and indicates the role of two main factors, policy reforms and liberalization and the country's comparative advantage in labour-based services. The growth in communications services exports reflects the impact of liberalization and deregulation of services such as telecommunications while the growth in other business services and computer and information services reflects Bangladesh's large pool of manpower and the growing opportunities in emerging services to export skill-intensive and professional services.

Table 7: Value and Share of Exports and Imports for different Service Subsectors

	2005				2010			
	Export		Import		Export		Import	
	value (USD million)	Share (%)	value (USD million)	Share (%)	value (USD million)	Share (%)	value (USD million)	Share (%)
Total services	1249	100	2206.66	100	2418.17	100	4395.55	100
Transport	113.009	9.05	1544.73	70	173.591	7.18	3440.64	78.28
Travel	70.009	5.61	136.27	6.18	81.221	3.36	260.6	5.93
Other services	1065.98	85.35	525.66	23.82	2163.36	89.46	694.32	15.8
Communications	23.906	1.91	20.62	0.93	277.67	11.48	20.23	0.46
Construction	14.156	1.13	1.07	0.05	6.909	0.29	6.29	0.14
Insurance	5.027	0.4	150.65	6.83	6.841	0.28	26.32	0.6
Financial services	17.972	1.44	13.27	0.6	40.841	1.69	45.35	1.03
Computer and information	18.713	1.5	4.26	0.19	37.756	1.56	5.42	0.12
Royalties and licence fees	0.261	0.02	2.75	0.12	0.517	0.02	17.64	0.4
Other business services	210.013	16.81	137.72	6.24	582.147	24.07	305.7	6.95
Personal, cultural and recreational services	1.144	0.09	0.03	0	1.925	0.08	0.13	0
Government services n.i.e.	774.79	62.03	195.3	8.85	1208.76	49.99	267.25	6.08
Memo item: Commercial services	474.21	37.97	2011.36	91.15	1209.41	50.01	4128.3	93.92

Data Source: UNCTADSTAT

Bangladesh's services imports have also registered a considerable increase during the same period, from USD 2.2 billion in 2005 to USD 4.4 billion in 2010. The share of traditional services such as transport has increased. This growing dependence on imports of transport services reflects the demand from the ready-made garment sector and Bangladesh's reliance on foreign transport carriers given its capacity constraints in transport and logistics (as also highlighted by many experts and in many reports). There has also been a significant increase in imports of other business services and imports of computer and information as well as communications services over this period, reflecting the growing importance of these sectors to the economy.

Table 8 shows that, overall, the trade deficit in services grew from around USD 958 million to nearly USD 2 billion during 2005 and 2010. This deficit is concentrated in traditional services such as transport and travel, whereas there has been a positive trade balance in emerging segments such as communications, other business services, and, to a lesser extent, computer and information services.

Table 8: Trade balance in services (millions USD)

	2005	2010
Total services	-957.66	-1977.38
Transport	-1431.72	-3267.05
Travel	-66.261	-179.379
Other services	540.32	1469.04
Communications	3.286	257.44
Construction	13.086	0.619
Insurance	-145.623	-19.479
Financial services	4.702	-4.509
Computer and information	14.453	32.336
Royalties and licence fees	-2.489	-17.123
Other business services	72.293	276.447
Personal, cultural and recreational services	1.114	1.795
Government services n.i.e.	579.49	941.51
Memo item: Commercial services	-1537.15	-2918.89

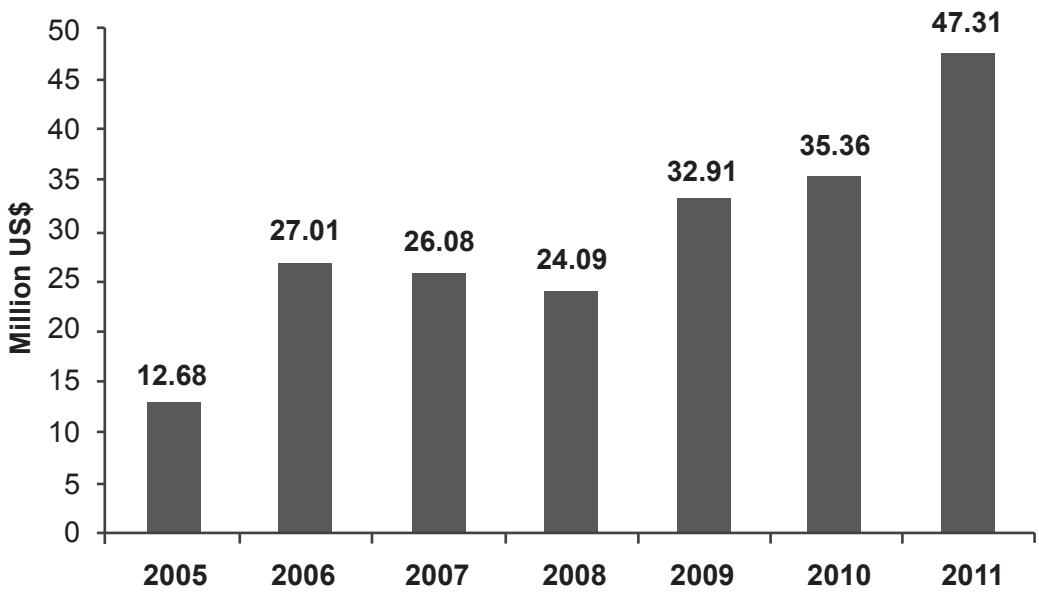
Data Source: Calculated from Table 7

These service trade figures clearly highlight two important points: first, that Bangladesh is potentially more competitive in the non-traditional services, which rely more on information and communication technology and availability of low-cost labour and where significant reforms have been undertaken; and second, that it is not competitive in traditional services where infrastructure availability and supply capacity are critical for delivery and where less progress has been made in terms of policy reforms. Exports of computer and information services remain low but there has been notable growth, though from a much smaller base value. The growth trends in the different segments of services similarly confirm the growing importance of newly emerging services in Bangladesh's export basket compared to traditional services and likely potential in these areas in future.

5. AN OVERVIEW OF THE IT SECTOR OF BANGLADESH

Bangladesh's IT subsector has grown from a negligible size industry to one that was worth USD 350 million in annual revenues in 2009, with software exports nearly trebling from a little less than USD 13 million in 2005 to USD 35 million in 2009 and further to USD 47.3 million in 2011.[2] IT and non-voice IT-enabled services (ITeS) constitute the bulk of these exports. Figure 1 shows the huge increase in IT exports between 2005 and 2010.

Figure 1: Export of Software and Information Technology-Enabled Services– Bangladesh (USD million)



Source: http://www.basis.org.bd/index.php/resource and KPMG report (2012)

According to a recent KPMG report, currently there are over 800 IT and non-voice ITeS companies in Bangladesh, of which around 200 work on a global basis for outsourcing and project-based delivery models.[3] Many companies have been set up through joint ventures with overseas companies or as offshore development centres with 100 per cent foreign capital. Voice-based business process outsourcing (BPO) services, though constituting a relatively small share of the total industry at present, have been growing rapidly. Today, Bangladesh has more than 60 call centres. According to the Bangladesh Call Centre and Outsourcing (BACCO) association, there are over 15,000 agents working in this segment. BPO services revenues stood at USD2 million in 2010.

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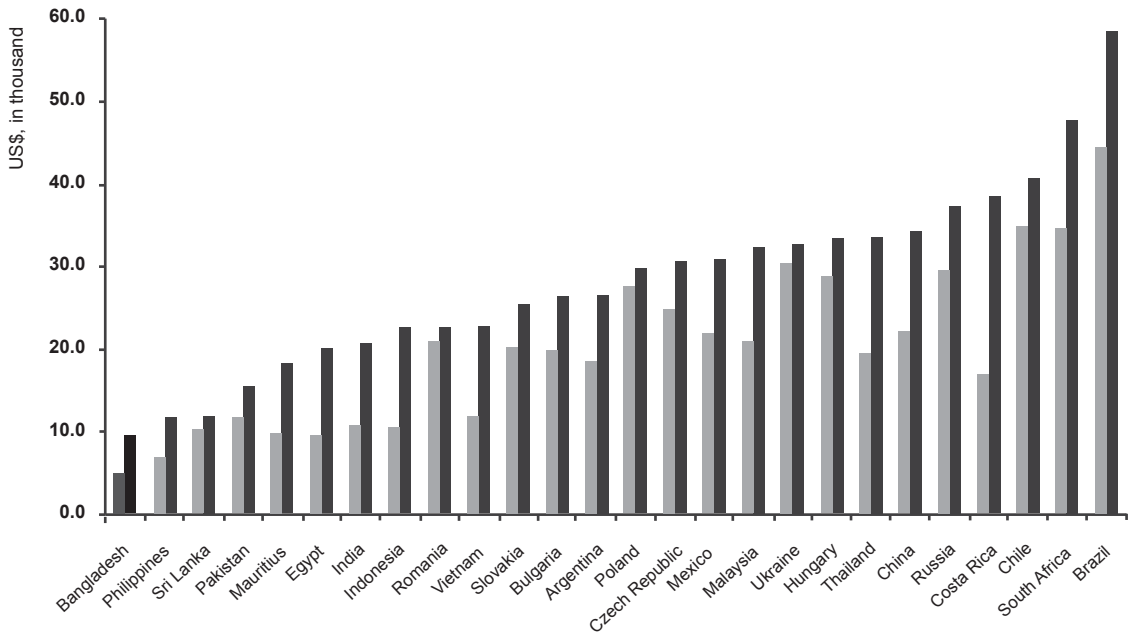
2 http://www.basis.org.bd/index.php/resource

3 According to the Bangladesh Association of Software Information Services (BASIS), there are more than 500 IT and ITeS companies registered in Bangladesh, employing over 12,000 IT professionals. Of these over 20 per cent export their products and services to over 30 countries and around 6 per cent have been set up with foreign capital. Numbers from other sources vary to some extent but are broadly in this range.
See, ITC and KPMG (2012)

At present, Bangladesh is exporting IT products to more than 60 countries of the world. The main export markets are North America (accounting for 61 per cent), followed by the EU countries (accounting for 13 per cent), and East Asia, especially Japan (5 per cent).[4] The USA still dominates as an export destination for Bangladeshi software companies. The other two important destinations are the UK and Canada. In recent years, countries like Australia and Denmark have also been emerging as important export destinations. A number of companies have also achieved considerable success in some Asian and African markets including Japan, Malaysia, Singapore, Saudi Arabia, and South Africa. One of the most remarkable successes in recent times is the penetration by Bangladeshi software companies (though in limited scale and for some niche product markets) into the highly competitive Indian market.

Figure 2: Average salary cost at entry level and 5 years of experience ('000s of USD)



Source: ITC and KPMG (2012), Figure 8, p. 22

A variety of factors have contributed to the rapid growth of this industry. The country has benefited from its large number of English speakers and pool of graduates, with their well-established delivery capabilities. There are over 80 universities that produce over 185,000 graduates each year, including more than 14,500 graduates and post-graduates in IT and related areas. An estimated 5,500 or more graduates specialize in software engineering providing a ready source of cost-competitive and competent labour for this industry.[6] There are also specialized training insitutes producing IT graduates. Growing education industry linkages have benefited the industry

4 See, ITC and KPMG (2012)

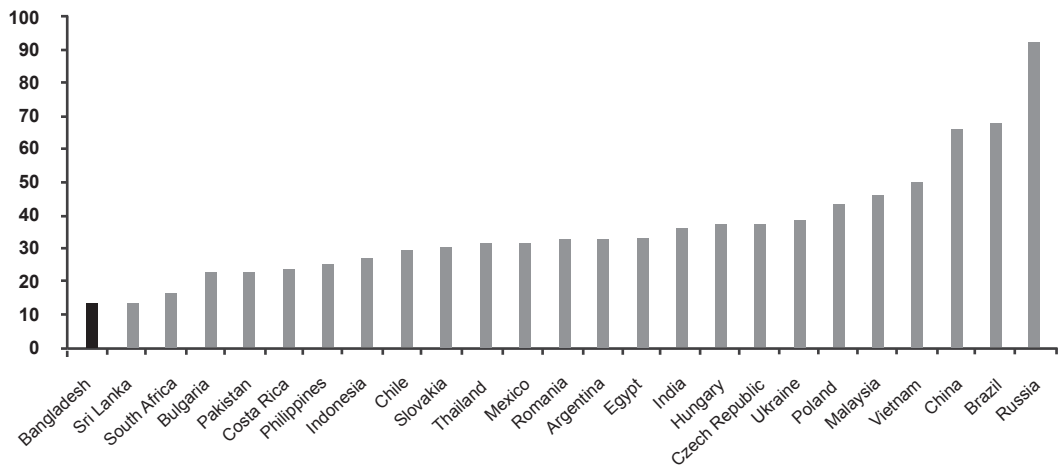
5 BASIS (2011)

6 http://www.basis.org.bd/index.php/resource

by providing a ready pool of professionals. Bangladesh thus scores favourably on labour costs. Entry level wages in its IT industry are over 50 per cent lower than in other Asian countries and wage inflation is considerably lower (Figure 2).

Bangladesh also compares well on infrastructure costs. Real estate costs are significantly lower than in other competing destinations, for instance, 20 per cent of that in Delhi. The sector has also benefited from growing teledensity, rising internet penetration, falling bandwidth costs, and a growing and maturing market for telecom services. The rapid growth in freelance outsourcing has been driven by the ease of setting up operations, growing internet penetration, and limited infrastructure requirements. In addition, quality improvements in skill levels and delivery capabilities, quality and information security certifications obtained by Bangladeshi outsourcing vendors, and the ability of Bangladeshi companies to offer domain specific services owing to the country's large and growing domestic market in areas such as banking and financial services and telecom, have also contributed to the industry's growth.

Figure 3: Average office rental cost in CBD (USD/sq. ft. per year)



Source: ITC KPMG (2011), Figure 9, p. 23

Government measures in terms of the establishment of technology parks within Dhaka and surrounding areas to provide ready infrastructure including network, connectivity and telecom and power backups, initiatives to promote IT capacity building, tax incentives, and the introduction of an IT Act to ensure IPR protection and to regulate e-transactions have also played an important role in driving growth in this industry. The government of Bangladesh has also taken up several policies towards the development of public IT projects. The focus of these projects is in the form of e-governance and office automation. The government has also clearly mentioned its vision of e-governance and promotion of the IT sector in the Sixth Five Year Plan.[7]

[7] PC (2011).

6. RESULTS FROM THE CGE MODEL

The application of computable general equilibrium analysis allows assessing the impacts of exogenous shocks primarily through changing prices. The SAM, as has been mentioned before, serves as the consistent and comprehensive database for the CGE simulations of three IT exports scenarios. The scenarios are as follows: (1) **Short term**: IT exports are assumed to double compared to the base-case; (2) **Medium term**: IT exports are assumed to increase five-fold compared to the base-case; and (3) **Long term**: IT exports are assumed to increase ten-fold times compared to the base-case. In the Bangladesh CGE model, the aforementioned three scenarios are run considering changes in export demand in the IT sector.

6.1. Macro Results

The macroeconomic impacts of the three scenarios are reported in Table 9. Under all three scenarios, real GDP, consumer price index, total exports, and total imports would rise. However, the largest impacts are observed under the long term scenario. Doubling the IT exports would lead real GDP to rise by 0.1 per cent compared to the base. However, a rise in IT exports by a factor of 10 would lead real GDP to rise by 1.03 per cent from the base.

Table 9: Impacts on Macro Variables (Per cent change from base)

	Short term	Medium term	Long term
Real GDP	0.10	0.52	1.03
Consumer Price Index	0.05	0.28	0.58
Total Export	0.08	0.35	0.69
Total Import	0.15	0.81	1.63

Source: CGE simulation

Note: Short term = IT export is assumed to be doubled compared to the base-case; Medium term = IT export is assumed to be increased by five times compared to the base-case; Long term = IT export is assumed to be increased by ten times compared to the base-case.

6.2. Sectoral Results

The sectoral impacts of the CGE simulations of three scenarios are reported in Table 10. The pattern of sectoral impacts is similar under the three scenarios and maximum impacts would be observed under the long-term scenario. In the short term, doubling the IT exports would lead to a rise in production in the IT sector by 41 per cent. This scenario would lead to rises in overall outputs in the agricultural, industrial, and the services sectors. However, due to a reallocation of factors, there would be a small fall in production in some industrial sectors, such as jute and yarn, RMG, knitting, furniture industry, fertiliser industry, and chemical industry.

In terms of the impact on sectoral exports, apart from the IT sector, all other export-oriented sectors would experience some fall in exports, due to two factors: first, there would be some reallocation of resources in favour of the IT sector, and second, the rise in IT exports would lead to an appreciation of the real exchange rate and thus would have some negative impacts on other export-oriented sectors. However, due to the rise in domestic demand through the rise in real incomes of the households, production in these sectors would not fall. In the case of the impact on

sectoral imports, the IT sector would experience a fall in imports due to the large increase in production in this sector. However, imports in almost all other sectors would increase.

Table 10: Impacts on Sectoral Production, Export and Import (Per cent change from base)

Sectors	Short term			Medium term			Long term		
	O	E	M	O	E	M	O	E	M
Cereal Crop sectors	0.10	0.01	0.20	0.53	0.03	1.02	1.06	0.05	2.04
Commercial crops	0.02	-0.06	0.14	0.10	-0.31	0.74	0.20	-0.61	1.47
Livestock Rearing	0.06	-0.05	0.22	0.33	-0.29	1.14	0.65	-0.58	2.28
Poultry Rearing	0.08	-0.05	0.24	0.40	-0.27	1.25	0.79	-0.53	2.50
Fishing	0.04	-0.08	0.23	0.19	-0.41	1.20	0.38	-0.81	2.40
Forestry	0.11			0.54			1.08		
Agriculture	**0.07**	**-0.07**	**0.15**	**0.35**	**-0.39**	**0.78**	**0.69**	**-0.77**	**1.56**
Rice Milling	0.11	0.00	0.22	0.58	0.00	1.17	1.16	0.00	2.33
Grain Milling	0.12	0.00	0.23	0.60	0.01	1.19	1.19	0.01	2.38
Food Process	0.08	-0.02	0.19	0.41	-0.09	0.98	0.82	-0.18	1.95
Leather Industry	0.03	-0.05	0.21	0.18	-0.26	1.11	0.35	-0.51	2.22
Jute and Yarn	-0.11	-0.10	-0.04	-0.59	-0.55	-0.22	-1.18	-1.08	-0.44
Cloth milling	0.02	-0.04	0.10	0.08	-0.20	0.54	0.15	-0.40	1.07
RMG	-0.10	-0.10	0.08	-0.53	-0.55	0.44	-1.06	-1.10	0.88
Knitting	-0.08	-0.10	0.25	-0.44	-0.51	1.31	-0.88	-1.01	2.62
Toiletries	0.05	-0.01	0.14	0.27	-0.07	0.72	0.53	-0.15	1.43
Cigarette Industry	0.11	0.00	0.22	0.55	-0.01	1.14	1.09	-0.02	2.27
Furniture Industry	-0.01	-0.08	0.17	-0.07	-0.40	0.88	-0.14	-0.79	1.76
Paper, printing and publishing Industry	0.00	-0.06	0.12	0.01	-0.30	0.63	0.01	-0.60	1.25
Pharmaceuticals	0.09	-0.01	0.20	0.45	-0.06	1.04	0.89	-0.13	2.08
Fertilizer Industry	-0.09	-0.12	0.10	-0.47	-0.64	0.53	-0.93	-1.27	1.05
Petroleum	0.03	-0.02	0.10	0.12	-0.10	0.52	0.23	-0.22	1.04
Chemical Industry	-0.02	-0.07	0.11	-0.10	-0.36	0.56	-0.20	-0.71	1.12
Glass Industry	0.05	-0.04	0.20	0.28	-0.22	1.04	0.54	-0.44	2.07
Earth-ware and clay industry	0.10	-0.03	0.25	0.51	-0.15	1.32	1.02	-0.31	2.65
Cement	0.18	0.03	0.31	0.96	0.16	1.62	1.90	0.30	3.25
Metal	0.14	0.01	0.28	0.74	0.04	1.46	1.48	0.08	2.93
Miscellaneous Industry	0.04	-0.04	0.21	0.22	-0.20	1.10	0.43	-0.40	2.20
Mining and Quarrying	0.13	-0.02	0.30	0.68	-0.11	1.59	1.36	-0.23	3.18
Industry	**0.05**	**-0.09**	**0.16**	**0.23**	**-0.48**	**0.81**	**0.46**	**-0.97**	**1.63**
Construction	0.15			0.79			1.56		
Electricity and Water Generation	0.18			0.95			1.89		
Gas Extraction and Distribution	0.08			0.39			0.77		
Wholesale and retail trade	0.05			0.26			0.51		
Transport	0.04	-0.04	0.16	0.21	-0.23	0.85	0.41	-0.46	1.69
Health Service	0.08			0.40			0.80		
Education Service	0.05			0.25			0.49		
Public Administration and Defence	0.04	0.01	0.08	0.13	-0.07	0.49	0.20	-0.22	1.02
Bank Insurance and Real estate	0.16	0.04	0.25	0.85	0.20	1.37	1.70	0.36	2.78
Hotel and Restaurant	0.10			0.52			1.02		
Communication	0.31	0.11	0.45	1.68	0.57	2.42	3.38	1.13	4.90
Information Technology and ECom	41.20	100	-13.08	225.36	500	-35.45	456.65	1000	-44.67
Other Services	0.10	-0.02	0.23	0.51	-0.10	1.20	1.01	-0.20	2.41
Services	**0.14**	**0.22**	**0.15**	**0.73**	**1.07**	**0.81**	**1.46**	**2.11**	**1.64**
Total	**0.09**	**0.08**	**0.15**	**0.48**	**0.35**	**0.81**	**0.96**	**0.69**	**1.63**

Source: CGE simulation

Note: O = production, E = export, M = import

Short term = IT export is assumed to be doubled compared to the base-case; Medium term = IT export is assumed to be increased by five times compared to the base-case; Long term = IT export is assumed to be increased by ten times compared to the base-case.

6.3. Employment Effects of CGE Simulations: Link with Employment Satellite Matrix

The CGE simulation results are linked to the employment satellite matrix and the resultant employment effects are reported in Table 11. Table 11 suggests that total employment of unskilled and skilled labour would rise under all three scenarios and the magnitudes of the rise in employments are much higher under the CGE simulations than those under the multiplier model. The employment effects of the short-term scenario are also quite large. The largest impact on total employment would, however, be under the long-term scenario, where there would be additional employment of 807,769 unskilled labour (1.84 per cent rise over base) and 80,306 skilled labour (2.41 per cent rise over base). The major rise in employment would come from the agricultural and services sectors. It also appears that under all three scenarios, the indirect employment generation would be much higher than the direct employment generation.

Table 11: Employments effects of CGE Simulation

Sectors	Short term		Medium term		Long term	
	UL	SL	UL	SL	UL	SL
Cereal Crop sectors	22699	16	117623	83	233967	165
Commercial crops	3715	2	19160	9	38052	19
Livestock Rearing	4691	805	24528	4208	48981	8404
Poultry Rearing	3891	595	20320	3105	40570	6199
Fishing	1682	271	8782	1412	17518	2817
Forestry	1326	241	6944	1261	13895	2524
Agriculture: Number	**38004**	**1928**	**197358**	**10079**	**392982**	**20127**
Per cent change over base	**0.18**	**0.23**	**0.92**	**1.21**	**1.84**	**2.41**
Rice Milling	597	1	3117	6	6224	11
Grain Milling	25	9	129	48	258	95
Food Process	520	45	2707	233	5395	464
Leather Industry	144	11	748	57	1490	114
Jute and Yarn	-22	-2	-115	-12	-229	-25
Cloth milling	597	22	3075	113	6101	223
Woven RMG	9	1	-68	-7	-231	-24
Knitting	15	1	77	4	152	8
Toiletries	33	4	173	23	344	46
Cigarette Industry	330	20	1726	104	3448	208
Furniture Industry	1335	27	6938	141	13812	281
Paper, printing and publishing Industry	132	42	681	216	1351	428
Pharmaceuticals	138	23	719	122	1436	244
Fertilizer Industry	41	11	210	57	418	113
Petroleum	19	7	99	34	198	67
Chemical Industry	168	21	868	107	1725	213
Glass Industry	11	6	59	29	117	58
Earth-ware and clay industry	634	8	3311	41	6608	81
Cement	138	11	722	56	1443	113
Metal	532	82	2785	431	5562	860
Miscellaneous Industry	983	116	5112	602	10178	1200
Mining and Quarrying	9	2	45	8	90	17
Industry: Number	**6387**	**466**	**33118**	**2413**	**65892**	**4796**
Per cent change over base	**0.13**	**0.12**	**0.68**	**0.64**	**1.35**	**1.28**
Construction	4288	210	22408	1095	44752	2187
Electricity and Water Generation	187	44	988	234	1982	470
Gas Extraction and Distribution	14	9	72	49	143	97
Wholesale and retail trade	9849	101	51134	525	101732	1044
Transport	5463	49	28377	253	56479	503
Health Service	127	557	663	2914	1324	5820
Education Service	223	957	1157	4962	2301	9866
Public Administration and Defence	693	85	3015	369	5500	674
Bank Insurance and Real estate	765	568	4013	2979	8018	5954
Hotel and Restaurant	1374	32	7128	167	14178	333
Communication	602	7	3212	38	6470	77
Information Technology and E-Commerce	1759	1965	9670	10807	19720	22040
Other Services	8302	608	43275	3169	86294	6319
Services: Number	**33646**	**5192**	**175112**	**27561**	**348896**	**55383**
Per cent change over base	**0.19**	**0.24**	**0.99**	**1.30**	**1.97**	**2.61**
Total: Number	**78037**	**7587**	**405588**	**40053**	**807769**	**80306**
Per cent change over base	**0.18**	**0.23**	**0.92**	**1.20**	**1.84**	**2.41**

Source: Employment Satellite Matrix

Note: UL = unskilled labour, SL = skilled labour

Short term = IT export is assumed to be doubled compared to the base-case; Medium term = IT export is assumed to be increased by five times compared to the base-case; Long term = IT export is assumed to be increased by ten times compared to the base-case.

7. STAKEHOLDERS' VIEWS ABOUT THE IT SECTOR

Most of the stakeholders held the view that after India, Bangladesh can become the most attractive IT outsourcing destination in South Asia. Their claims are supported by some recent studies.[8] Bangladesh was ranked third among all off-shoring countries of south Asia and in terms of competitiveness Bangladesh was ranked at the top.[9]

It was evident from the interviews with stakeholders that Bangladesh's IT sector has a significant advantage in terms of both labour and infrastructure cost. A recent report by the Board of Investment of Bangladesh also supports this claim. The report mentions that a programmer in Bangladesh gets a salary which is equivalent to 40 per cent of the same salary in India, 50 per cent in the Philippines, and 70 per cent in Vietnam. Also, internet bandwidth charges are much lower in Bangladesh than many other countries; for example, compared to India the cost is 50 per cent lower.[10] The stakeholders also emphasized the availability of ICT education facilities in Bangladesh.

Though the IT sector of Bangladesh has almost all the necessary ingredients for success, according to industry stakeholders, there remain some perceived threats for the industry. Despite the cost advantages and availability of IT education, according to many stakeholders, the skills of the labour force in Bangladesh's IT sector are not up to the required level. This is due to the lack of an updated curriculum, inadequately trained teachers, and a lack of adequate facilities in relevant institutions.

[8] For example, a study by JICA mentioned in BASIS (2010)

[9] BASIS (2010)

[10] BASIS (2010)

The teachers of colleges under the National University, as well as the new universities of science and technology are not sufficiently trained to adopt current changes in science and technology. The in-house and overseas training facilities are not adequate for the scientists who are working on cutting edge technologies. Many staff members do not return home after the expiry of their training period and thus contribute to the poor performance or failure of projects. It was strongly argued by the stakeholders that without improvements in the skill sets of the IT labour force, the country would not be able to exploit its potential especially when there was stiff competition from countries such as India, the Philippines, Vietnam, and China. The stakeholders also highlighted another problem which was related to the lack of a methodical approach: companies in Bangladesh in general suffer from a lack of documentation and work process skills. Companies also face difficulties in quality control.

The stakeholders also perceived a lack of finance as one of the major obstacles for Bangladeshi entrepreneurs in the IT sector. Finance is required to enable firms undertake productive investments in order to initiate and/or expand a business. The availability of investment funds also facilitates the acquisition of better technology to promote competitiveness. Most stakeholders complained that in Bangladesh investors faced credit constraint and had to pay high interest rates on loans unrelated to their own performance. The problem is even worse for small and medium scale enterprises (SMEs), including the export-oriented ones. Banks are shy to lend to SME activities, as they do not consider them to be attractive and profitable undertakings. In most cases banks and non-bank financial institutions require collateral in the form of land and buildings for advancing loans to their clients. The value of the real-estate security is usually set much higher than the amount of the loan, which many enterprises are unable to provide as collateral. Furthermore, the loan application forms for investment financing from banks are long, tedious, and redundant. Exporters outside Dhaka have faced more problems with export finance than those in Dhaka.

According to the stakeholders, there are also emerging human resource constraints in this sector. Although the country's IT policy is favourable, Bangladesh may face a big 'resource crunch' in the near future on account of the brain drain and the growing attractiveness of other business sectors, which are pulling away professionals and thus reducing the number of professionals who pursue an IT career. There are also physical infrastructural constraints, chief among which is the lack of availability of continuous power supply. Power generation capacity in Bangladesh is still among the lowest in the world and power failures and load shedding are rampant. Frequent power failure and low voltage stand as a big hurdle for software companies in Bangladesh. Domestic and international companies are working to find solutions, such as using low-power IT equipment. It came out very prominently in the discussions with the stakeholders that there is little coordination between policy making and the implementation of IT-related activities which are carried out by a number of government entities. This acts as a barrier in carrying out the Master plan of building a Digital Bangladesh. Currently two ministries- the Ministry of Post and Telecommunications (MoPT) and the Ministry of Information (MoI)- along with the Bangladesh Telecommunications Regulatory Commission (BTRC) are involved in dealing with IT-related infrastructure. Telecommunications, including internet, are dealt with by the MoPT, while the MoI deals with broadcasting- both radio and television. Since these two technologies are interlinked- Internet Protocol TV (IPTV) or IP radio- it is essential that they be regulated by a single authority. The Ministry of Science and

Information and Communication Technology (MoSICT) works for promoting the IT business sector through its wing, the Bangladesh Computer Council (BCC), rather than through its central authority.

The only ICT incubator in the country, located in Karwan Bazaar, is managed by the BCC. The BCC has been trying to implement the High Tech Park (HTP) for more than a decade in Kaliakoir, which is also meant for IT business. On the other hand, the Ministry of Commerce is also trying to promote IT business through the ICT Business Promotion Council (IBPC). For taking care of e-governance-related activities, there are two distinct government entities- one is the e-government cell, created in the Prime Minister's Office (PMO). The e-government cell is implementing the "Access to Information" programme. Under this programme, each Ministry has an IT focal point for taking care of e-government-related activities. The second entity is the “Support to ICT Task Force” Project (SICT) under the Ministry of Planning. Although the SICT is under the ICT Taskforce, it is not bound to report to the Taskforce. The lack of coordination among implementing authorities has been causing setbacks to the progress of IT development.

Stakeholders highlighted the importance of bringing in the large number of labour force engaged in the informal IT sector, under the formal IT sector and to upgrade their skills. Stakeholders also emphasised decent work issues such as occupational safety and health, long working hours, and low wages in the informal IT sector employment to be taken into consideration while formulating policies. Environmental aspects, such as management of e-waste, also need to be taken into account. Stakeholders also highlighted that the low wage structure leaves this sector in a low-wage/low-skill trap, which should be addressed in order to increase the competitiveness and productivity of the sector in the longer term.

Stakeholders emphasized that the quality of internet service in Bangladesh was worse than that in countries like China, Sri Lanka, and Vietnam. Internet access costs are high and speed is limited. The stakeholders, however, held the view that once a 3G license was permitted, the situation would improve. Also, domestic use of bandwidth needs to be increased as the capacity of submarine cable is not yet fully exhausted.

Stakeholders also highlighted that the official data on the export of IT industry was underestimated since tracking revenue earnings of outsourcing work was difficult. There are a large number of freelancers in the Bangladesh IT industry who are involved in informal business. Freelancers use online payment systems or informal channels to receive payment as they cannot receive money through formal banking channels. Therefore, export income is not recorded.

8. POLICY RECOMMENDATIONS AND CONCLUSIONS

The study has shown that there could be significant potential of positive impacts at the macro and sectoral levels due to the rise in IT exports from Bangladesh. Also, direct and indirect employment generation could be noticeably large. Steps should be taken in order to realise such potential.

There is a need for the formulation of a universal access policy and broadband policy for ensuring equity in ICT-based growth and development. To implement this policy, details of the relevant rules such as the Patent Law, Secrecy Act, Consumer Protection Act, Trade Mark Act, Foreign Exchange Regulation Act, and Income Tax Act should be taken into consideration so that there is no infringement of rights or violation of existing rules when implementing the IT Policy.

In general, the Bangladeshi workforce lacks English language proficiency and there is room for improvement. Therefore, there is a critical need to train the existing labour force. Training courses should be upgraded to reflect advanced technology. The stakeholders underscore the importance of specialized formal IT training to be in place to upgrade the skills of the people employed in the informal IT sector so that they can be employed in the formal IT sector. Provisions of 'internships' need to be considered for IT sector students.

The stakeholders highlight the importance of a Software Export Board primarily to promote the IT industry. In addition to other trade promotion activities, this board could propose legislation in light of international standards for the local IT Industry.

The stakeholders also emphasise the enhancing market demand for job creation in the IT sector. It is suggested that the government can take steps like the simplification of visa issuance processes for investors, branding, and providing facilities for setting up offices by investors. Also, VAT law should be amended and payment receipt process for freelancers (e.g. PayPal) should be simplified. Amendments and improvements of the Foreign Exchange Regulations Act, 1947, are necessary in order to accommodate the current needs for fund transfers from abroad. Besides, provision for a gateway should be functional and provision for online payment mechanisms should be allowed and simplified. The Letter of Credit (LC) as a transaction instrument should be allowed for the IT sector as well.

There is vast scope for expansion of the IT sector in Bangladesh as is evident from its international ranking in terms of teledensity and outreach. There is a need to advertise more vigorously the existing incentives, including fiscal and financial incentives for attracting local investment and FDI in IT through the PPP (Public-Private Partnership) initiative. Non-resident Bangladeshis can also play a significant role in the expansion of the IT sector. There is a lot of hope among most stakeholders that Bangladesh can be a successful supplier of IT and software exports. Its main advantage is perceived to be its potential to achieve a significant reduction in project costs. However, as highlighted in the discussions in the previous sections, along with such potential, Bangladesh also suffers from some constraints, due to which Bangladesh's IT sector is not yet well known internationally. To improve the situation, the major focus of the country needs to be on export promotion. The IT firms should focus more on marketing activities such as commercial representation, networking and advertising. If these issues are addressed, then there is scope for Bangladeshi IT companies to generate much more revenue from the global market.

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Annex 1: Mapping and Classification Scheme in the Social Accounting Matrix of Bangladesh 2007

Activity-Commodity 41	Activity-Commodity 86
Cereal Crop sectors	Paddy Cultivation, wheat Cultivation, Other Grain Cultivation
Commercial crops	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	Livestock Rearing
Poultry Rearing	Poultry Rearing
Fishing	Shrimp Farming, Fishing
Forestry	Forestry
Rice Milling	Rice Milling
Grain Milling	Grain Milling
Food Process	Fish Process, Oil Industry, Sweetener Industry, Tea Product, Salt Refining, Food Process
Leather Industry	Tanning and Finishing, Leather Industry
Yarn	Yarn Industry
Cloth milling	Cloth Milling, Handloom Cloth, Dyeing and Bleaching
RMG	RMG
Knitting	Knitting
Toiletries	Toiletries
Cigarette Industry	Cigarette Industry, Bidi Industry
Furniture Industry	Saw and Plane, Furniture Industry
Paper, printing & publishing	Paper Industry, Printing and Publishing
Pharmaceuticals	Pharmaceuticals
Fertilizer Industry	Fertilizer Industry
Petroleum	Petroleum
Chemical Industry	Basic Chemical, Chemical Industry
Glass Industry	Glass Industry
Earth-ware and clay industry	Earth-ware Industry, Clay Industry
Cement	Cement
Metal	Basic Metal, Metal Manufacturers
Miscellaneous Industry	Machinery and Equipment, Transport Equipment, Baling, Jute Fabrication, Miscellaneous Industry
Construction	Urban Building, Rural Building, Power Plant Building, Rural Road Building, Port Road Railway Building, Canal Dyke Other Buildings
Electricity and Water	Electricity and Water
Gas Extraction & Distribution	Gas Extraction & Distribution
Mining and Quarrying	Mining and Quarrying
Wholesale and retail trade	Wholesale trade, retail trade
Transport	Air Transport, Water Transport, Land Transport, Railway Transport, Other Transport
Health Service	Health Service
Education Service	Education Service
Public Administration & Def.	Public Administration & Def.
Bank Insurance and Real est.	Bank Insurance and Real est.
Hotel and Restaurant	Hotel and Restaurant
Communication	Communication
IT and ECom	IT and ECom
Other Services	Housing Service, Professional Service, Entertainment, Other Services

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