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Regional Economic Base Analysis of 20 Regions of Bangladesh Based on Industrial Sector

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Abstract

Bangladesh economy has been growing for the last few years (World Bank, 2018). It has 34th largest GDP across the world (Global Edge, 2017). In 2016, 7.1% GDP growth has made it the 2nd largest growing country in the world (Chowdhury and Hossain, 2019). This GDP growth does not represent the development of all sectors and regions of the country rather a few sectors and regions have the major contribution behind high rate. Though having 45% of the labor force work in agricultural sector, it lies at the bottom of the GDP composition in sectors (Global Edge, 2017). Again, the country's economy, education, commerce, industry etc. are highly centralized in Dhaka (Siddiqui. K et al. 2016). The study tries to find out the discrepancies in this regard. The study is based on twenty broader regions of Bangladesh and their regional economy. The economy of these regions depends on different industrial sectors. The shares of basic and non-basic industries are also different for these regions. The study has also revealed the strength of different industrial sectors in different regions playing both roles either basic or non-basic. It finds that despite centralization, some regions have potential in some specialized sectors. The study also finds that different economic factors are instrumental for the development of regions and sectors.

Introduction

Economic base analysis is an important tool in regional study to determine the regions' specialization in industrial sector to contribute to the economy. The economic base technique is based on the assumption that the local economy can be divided into two very general sectors: a) basic (or non-local) sector and b) non-basic (or local) sector. Economic base theory asserts that the means of strengthening and growing the local economy is to develop and enhance the basic sector. The basic sector is therefore identified as the "engine" of the local economy and called as the economic base of the local economy (Glasson, 1975). Basic sector/industry produces goods which they can export where non-basic sector mainly produce for consumption for the people of study area (Garrison, 1972:332). Hoyt (Hoyt, 1961:51) defined the basic industry as those which involved in producing goods for the people outside the city boundary. It tends to spend the money from export to buy imported goods unavailable in the city and necessary for the residents (Blumenfeld, 2007:115).

In this study, it has been attempted to explore the dimension of the regional economy of broader 20 regions (Dhaka, Faridpur, Mymensingh, Jamalpur, Tangail, Bogra, Rajshahi,

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Pabna, Dinajpur, Chittagong, Chittagong hill tracts (Bandarban, Khagrachari and Rangamati), Comilla, Noakhali, Khulna, Jessore, Kustia, Barisal, Patuakhali and Sylhet) of Bangladesh based on 15 different industrial sectors for the time period of 1995-96 and 2005-06. Bangladesh has 8 divisions and these districts have been selected to represent divisions and for their significance in those divisions (Figure 1). These districts symbolize the economy and employment distribution of their respective regions and are also important from the administrative perspective. The analysis has been done using national, regional and sectoral employment, location quotient, basic employment and economic base multiplier analysis.

The economy of these regions depends on several industrial sectors (Bangladesh Bureau of Statistics, 2013:03). Dhaka and Chittagong have very strong economy with provision of most number of employment sectors both in basic and non-basic industries. Some regions such as Sylhet, Tangail, Jessore, Barisal, Kustia has a handsome percentage of basic employment with respect to their total employment. But their number of total employment is low as the basic employment sectors cannot maintain a good forward linkage to provide a number of employment opportunities to the regional economy.

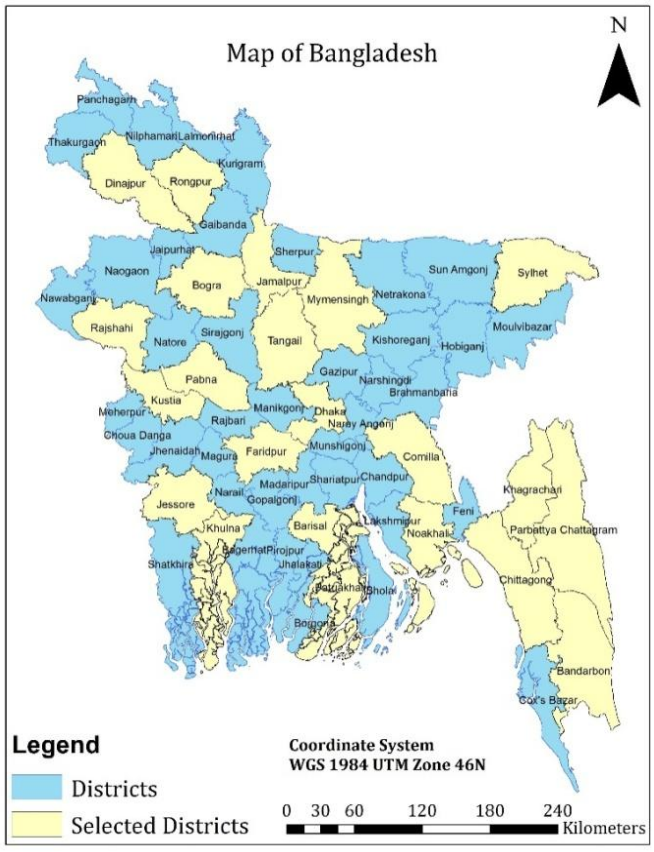


Figure 1: Map of Bangladesh.

Objectives and Methodology

Objectives

The primary objective of the study is to identify the productive industrial sector in national and regional scale for the years 1995 to 2006. Then the study tried to identify the districts having low income opportunity and causes behind it for the years 1995 to 2006.

Data Collection

Data of number of national employment, regional employment and employment growth in the broader 20 regions and 15 industrial sectors for the years 1995-1996 and 2005-2006 have been collected from Economic census, Zila series of Bangladesh Bureau of Statistics (BBS). Data have been collected for fifteen major industrial sectors. These are: food products and beverages, tobacco products, cotton and jute textiles, RMG, leather, wood and furniture, paper and printing, petroleum, pharmaceuticals, rubber and plastics, non-metallic mineral, Basic metals, electrical equipments, motor vehicle and other manufacturing (BBS Economic Census, 2001 and 2003 Zila series).The location quotients (LQ) for different sectors of 20 districts have been calculated for the two time intervals: 1995-96 and 2005-06.

Data Analysis

Location Quotient is one of the methods of short run analysis to measure the economic structure of any region. It tends to measure the concentration of any industry or occupation in any region comparing to the national context. It can describe any regions specialization in any particular industry or occupation (Glasson, 1975). It is the ratio of an industry's share of employment in a region's economy comparing to the national economy. Location Quotient for each industry in a region has been derived from the following equation:

$$\text{LQ} = \frac{\text{Percentage of Regional employment in industry i}}{\text{Percentage of National employment in industry i}}$$(Glasson, 1975)

Where i = 1, 2, 3… n

If the LQ value is greater than 1, the industry is export oriented and surplus GDP is circulated in the region after meeting the local demand. LQ value for an industry less than 1 indicates that the industry is non basic. For example, if a region has 8 percent of the nation's employment in "RMG" industry and 4 percent of the nation's total employment, then the region has surplus of "RMG" products and tend to export that in an amount equal to 4% of nations employment in "RMG" sector (Isserman, 1977:34).

Total basic activity is then calculated using the following equation:

$$Total\ Basic\ Activity = \sum_{i=1}^{n}\left(\frac{LQ-1}{LQ} \times E_i^r\right)$$(Glasson, 1975)

Where

$E_i^r = Regional\ employment\ in\ Industry\ i$

Economic base multiplier refers how much turnover is brought to the non-basic industry of a region by investing a dollar in the export oriented industry. It measures the productivity of sectors or regions. It can be found by dividing the total GDP or employment in both basic (export) and non-basic sector by GDP or employment in the

basic sector where Location Quotient value is greater than 1 (Isserman, 1977:34).

The economic base multiplier has been calculated afterwards using the equation below for different time intervals:

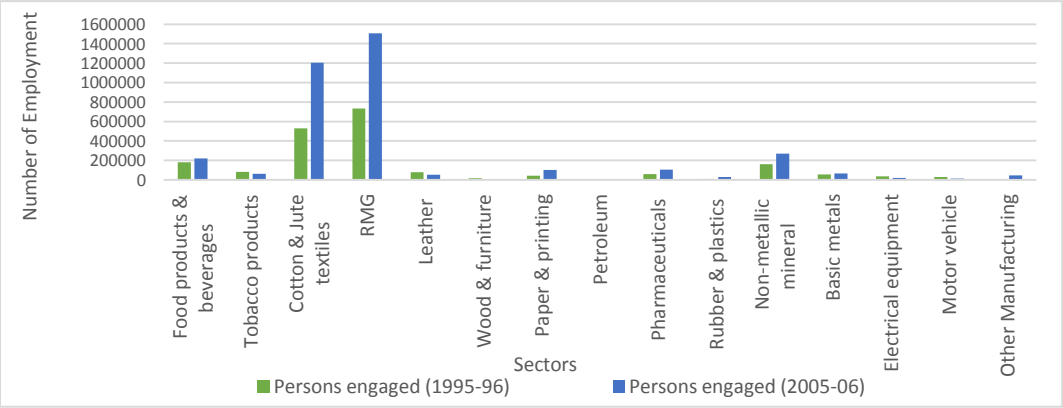
$$\text{Economic Base Multiplier} = \frac{\text{Total employment in basic and non basic indudustry}}{\text{Total employment in basic industry}}$$

The sectors have high economic multiplier and basic employment usually have forward linkages with other sectors. Forward linkages occur when an investment in an industry encourages investment in the subsequent stages of production by using the produced goods of that industry. Backward linkages are the production relationship between the supply sector and that industry to produce that good. Usually the basic or export industry/sector has the opportunity to create agglomeration economies by using backward and forward linkages in a specific region (Okubo, 2009:530). These industry/sectors are4 called the key sectors of that region (Sonis et. al. 1995:13). The flourishing and lagging sectors have been identified for both in the national scale and regional scale from the value of LQ's. Then, the growth rate of total, basic and non-basic employment for the 20 regions and 15 industrial sectors have been calculated for different time intervals. The employment growth of different industries and sectors has also been compared to find the potentials of flourishing industries and causes behind the lagging behind industries.

Results and Discussion

Inter-Regional Analysis

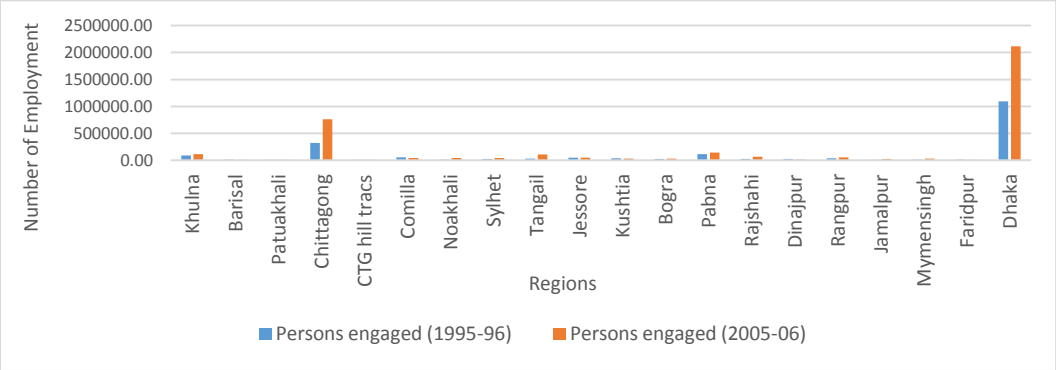
Among the selected industrial sectors, in national scale the RMG and cotton and jute textile sectors have been providing more employment opportunity than other sectors during both time periods. The increases of employment in these sectors are also more noteworthy than other sectors. Food products and beverage, non-metallic minerals and pharmaceuticals are flourishing sectors in terms of employment generation (Figure 2).



Source: BBS Economic Census, 2001 and 2003 Zila series.

Figure 2: Distribution of employment in different sectors

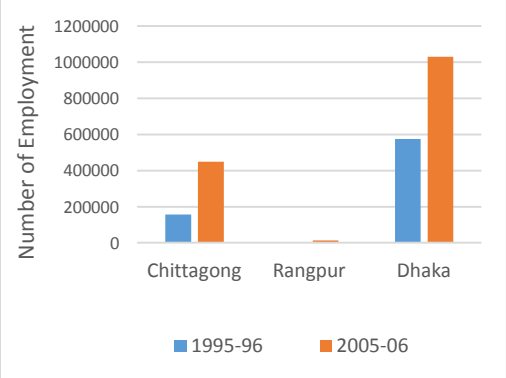
Among the regions, Dhaka and Chittagong have significantly overpassed other regions in employment generation (Figure 3). Dhaka and Chittagong possess about 57% and 20% of the national employment consecutively. These two are the most important cities in our country also. Dhaka is the capital and Chittagong provides the port facility of the whole country. Except these regions, Khulna and Pabna provide 3% and 4% employment of the economy. Jute mills in Khulna and Pharmaceuticals industry in Pabna has played the dominant role in generating those employment opportunity.



Source: BBS Economic Census, 2001 and 2003 Zila series.

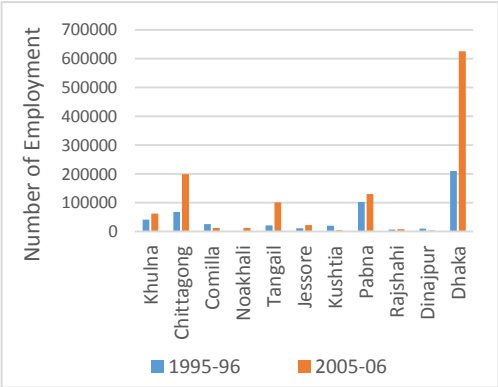
Figure 3: Distribution of employment in different regions

Some noteworthy employment generation sectors in the economy of Bangladesh are RMG and cotton and jute textile sector. RMG sector is confined only within Dhaka and Chittagong (Figure 4). The Figure 5 depicts that in cotton and jute, textile sector the employment generation is mainly centralized within Dhaka and Chittagong. Tangail, Pabna and Khulna are also marching in small steps in this sector. Pabna had the sector as large as Chittagong in 1995-96.



Source: BBS Economic Census, 2001 and 2003 Zila series.

Figure 4: Distribution of employment in RMG sector

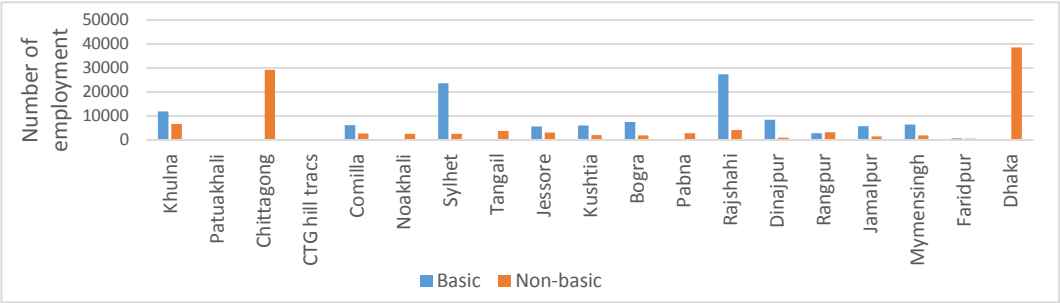


Source: BBS Economic Census, 2001 and 2003 Zila series.

Figure 5: Distribution of employment in Cotton and Jute textile

They didn't get the same increasing rate as Chittagong for having large distance from the sea port and poor infrastructure facility (Liton, Islam & Saha, 2016:74).

Food products and beverages is one of the thriving sectors in the economy. This sector is mainly trying to meet the needs of the domestic market. Dhaka and Chittagong have the non-basic employments whereas basic employments are prevalent in other districts. It reveals the fact that in this sector except Dhaka and Chittagong most regions produce goods for the people outside their boundary. This scenario can be accompanied by the statement that the raw foods and raw

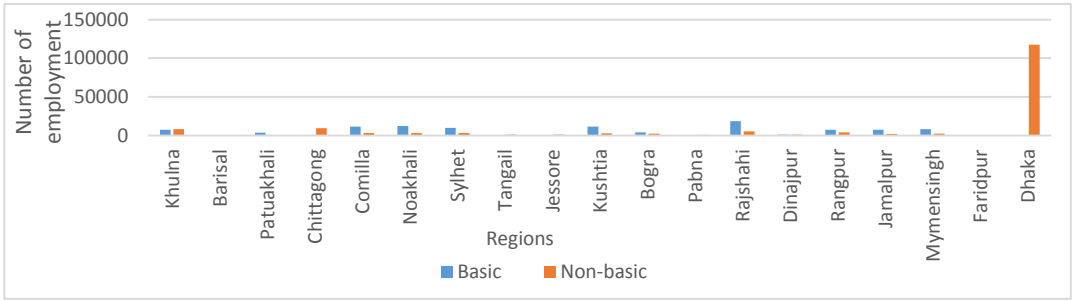


Source: BBS Economic Census, 2001 and 2003 Zila series.

Figure 6: Distribution of employment in Food and Beverages sector in 2005-06

materials of processed foods are generated from districts except Dhaka and Chittagong. Those districts have negligible non-basic employments in this sector as industries are not involved in value addition there. Those foods come to the capital and port city and get added value after being processed. It could be done in the region of origin by giving necessary education, technology, infrastructure, incentives and promotion (Mintoo, 2004:45). Food processing is the most thriving sector in SME (Small medium Sector) (Mintoo, 2004:46-47) despite Bangladesh's trade imbalances with neighboring countries (Siriwardana and Yang, 2007:25).

Bangladesh had insignificant amount of mineral products but some natural gas, coal and oil back in 2006. Natural gas production has been increasing from 2006 in large amount.



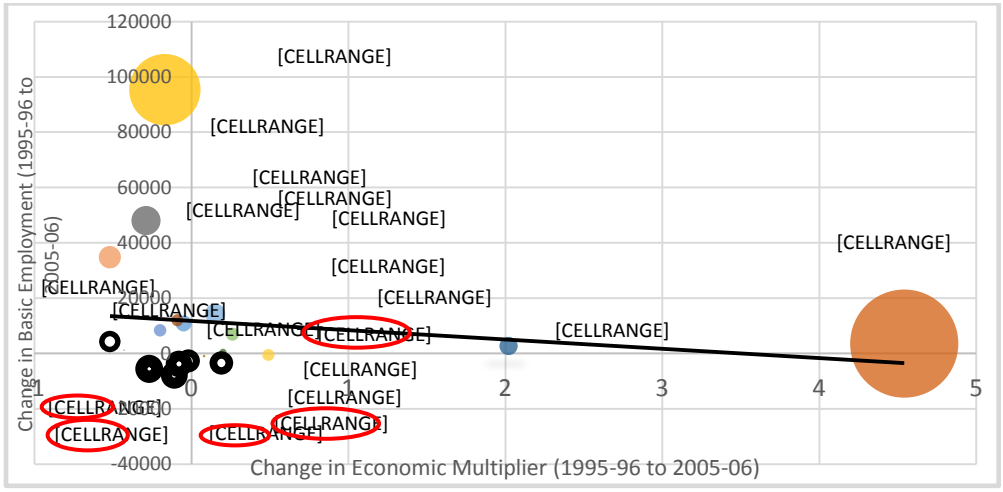
Source: BBS Economic Census, 2001 and 2003 Zila series.

Figure 7: Distribution of employment in Non-metallic Mineral sector in 2005-06

The country also produced small amounts of cement, clay, crude petroleum, limestone, nitrogen fertilizers, petroleum refined products, salt, and steel in very negligible amount (USGS, 2006:4.1). Winning the maritime boundary dispute with India and Myanmar has opened a potential in this sector in recent times (USGS, 2014:4.1). Figure 7 illustrates that Dhaka is contributing a large amount of employment in non-metallic mineral sector and among them most of them are non-basic. As a basic employment sector, other regions have some employment opportunity in this sector. It is because other regions are only the origin of those materials but the processing are done at industries based in Dhaka. So this sector is very productive in Dhaka as total employment is far better than basic employment.

The regional scenario of different sectors showed that development and employment generation in selected sectors have not happened in all the regions equally. For several factors there exist some developing regions and some lagging regions.

In some regions named Barisal, CTG hill tracs and Dinajpur both the growth in basic and total emolyment have decreased in the observed years. Whereas in some other regions, like Dhaka and Chittagong the growth is very high. It is also high in Khulna, Noakhali, Sylhet, Tangail, Pabna and Rajshahi.The Figure 8 presents the development of regions based on economic multiplier, basic employment and total employment. Economic trade multiplier for any region represents the productivity of that region. The magnitude of the graph represents the change of total employment of respective regions during that time period. The black bordered bubles shows the decreasing of total employment. For Dhaka, rise of its multiplier by 4.5 times was instrumental for its development despite minimum basic employment. The contribution of factors behind Chittagong's development is opposite. More dependency of chittagong's employment sector on its basic sector than Dhaka may be one of the cause behind the scenario (BBS Economic Census, 2013). Contribution of petrolium, non-metallic mineral and motor vehicle sectors cuts a large figure in chittagong's total employment as basic employment also.



Source: BBS Economic Census, 2001 and 2003 Zila series.

Figure 8: Regional economy of Bangladesh

Dhaka always gets the significance for setting up secondary and tertiary employment sector for high demand powered by increasing population (Banks, 2015:269). Red circled districs have experienced employment loss during these time periods.

The downward sloping trendline shows that there is negative relations between change in basic employment and change in economic multiplier to increase the total employment of a region. So, factors other than high basic employment is necessary for increasing total employment of a region.

Most of these districts have negative multiplier and basic employment also. These districts need incentives to promote basic sector and also industries having backward linkages with these basic sectors to recover the economy of these regions. Some regions have increase in one sector (eg. Noakhali has increasing multiplier value but low basic employment increase whereas regions like rajshahi and pabna has increasing basic employment but negative multiplier value). For regions like Rajshahi and tangail, it reveals the fact that the percentage of basic employment could not be the engine of the local economy in some sectors as these basic sectors could not create more non basic employment in the economy through its forward linkages.The productivity of Noakhali region is increasing which presents that it can be a potential economic center in the near future. Lack of basic sector can be the causes behind lower employment generation at this period which need to be improved. Thus the regions have significant employment increase despite some drawbacks of their economy. Employemnt opportunity can be raised in these regions by providing necessary initiatives in specific field.

Intra Regional Analysis

Among the regions, Dhaka producing most employment opportunity where Dinajpur producing the lowest (Table 1). Dhaka being the most employment generating region, it shows that RMG and cotton and jute textile sectors are responsible for this employment generation over the years. The rest of the sectors are also creating employment opportunity at an increasing rate. Dinajpur is one of the regions which experienced declination of the employment generation over the years under consideration.

Table 1: Sector wise employment generation in Dinajpur and Dhaka in different time periods

Sector of Employment	Dinajpur		Dhaka	
	Persons engaged (1995-96)	Persons engaged (2005-06)	Persons engaged (1995-96)	Persons engaged (2005-06)
Food products and beverages	13863	9365	42215	38462
Tobacco products	247	0	7748	11606
Cotton and Jute textiles	10264	2972	209643	625393
RMG	0	0	574636	1029869
Leather	0	0	66679	20736
Wood and furniture	1039	181	4878	1017
Paper and printing	0	39	30136	83703
Petroleum	0	0	96	50

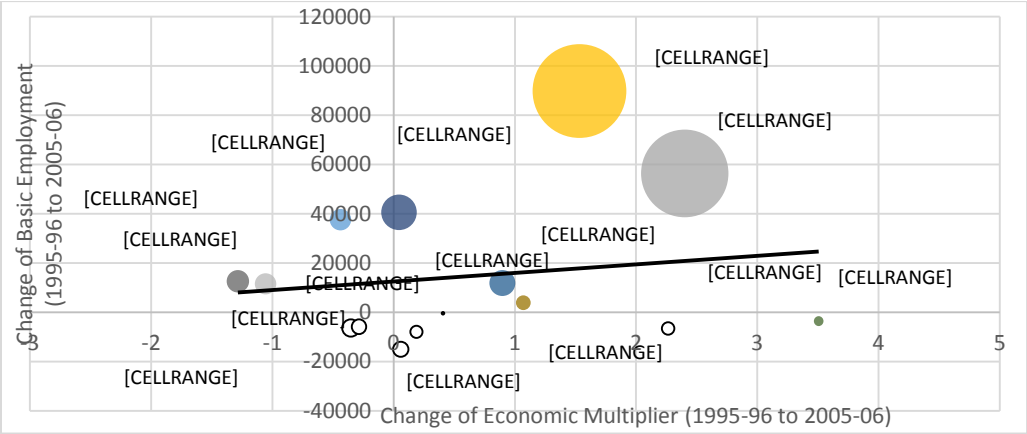
Sector of Employment	Dinajpur		Dhaka	
	Persons engaged (1995-96)	Persons engaged (2005-06)	Persons engaged (1995-96)	Persons engaged (2005-06)
Pharmaceuticals	250	79	28651	69359
Rubber and plastics	0	0	9413	21260
Non-metallic mineral	1667	2070	55113	117720
Basic metals	309	51	33473	36829
Electrical equipment	0	0	16220	15880
Motor vehicle	0	0	12319	8027
Other Manufacturing	0	285	2985	32411

Source: BBS Economic Census, 2001 and 2003 Zila series.

Geographical location, infrastructure facility and administrative significance play dominant roles behind these situations. Besides that, the economy of Dinajpur largely depends on Food sector for its traditional agrarian economy. The most productive sectors named "Cotton and Jute textiles" and "RMG" of Bangladesh for these time periods are not popular in Dinajpur. In fact, in food products and cotton and textile sector the employment have decreased dramatically which were the most employment generating sectors in the recent past for the region. The scenario is also similar for other lagging regions.

Identification of Productivity for Different Regions and Sectors

The economic sectors have improved in terms of employment generation and productivity by these time period irrespective of regions. Figure 9 illustrates the interrelations of change of economic multiplier and basic employment to influence the change in total employment in several sectors of Bangladesh economy. The dimension of the bubble represents the number of total employment increase in respective sectors. Sectors symbolizing black bordered bubbles have experienced decrease in employment.



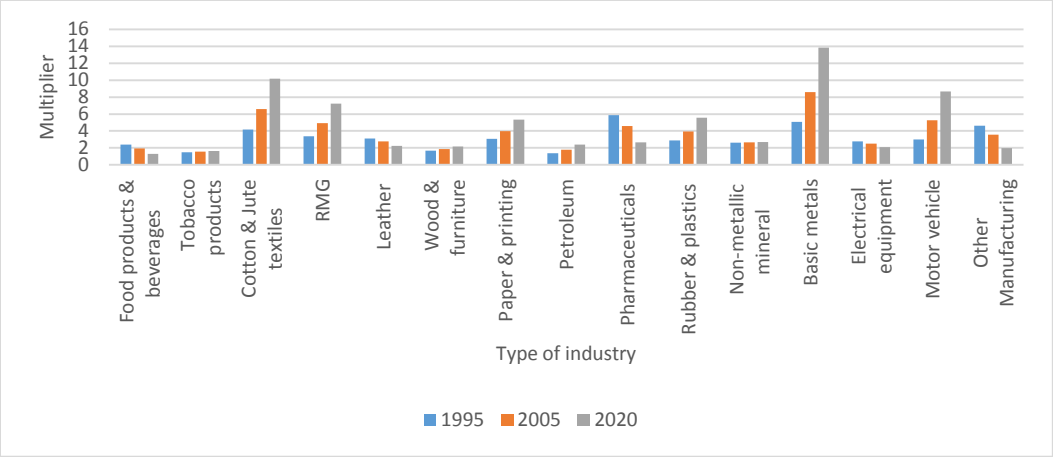
Source: BBS Economic Census, 2001 and 2003 Zila series.

Figure 9: Sectoral economy of Bangladesh

For overall sectors the trade multiplier has been increased. The sectors named RMG, cotton and jute textiles, rubber and plastics, paper and printing, basic metals and motor vehicle have greater multiplier value. Among them, basic metals, rubber and plastics and motor vehicle have lower increase in total income. On the other hand, food beverages, pharmaceuticals and non-metallic minerals provided more employment opportunity despite lower productivity. Self-dependency within the sector may be the reason behind these opposite scenario. Sectors having increasing multiplier and employment values present that these sectors are more productive which means these sectors have more total employment than their basic employment with respect to other sectors. So these sectors can create and foster more non-basic sector through their forward and backward linkages. These sectors have greater potential to create more employment in the lagging behind regions. Motor vehicle industry has higher multiplier value but decreasing employment generation. Basic sectors like production of raw materials can bring positive change in this industry.

The upward sloping trendline shows that, sectors which have both large number of basic employment and higher multiplier value provide employment at a large scale. So, productivity and self-dependency are simultaneously important for any sectors to improve.

Economic multiplier represents the productivity of any sector/region. The rise of employment in the basic sector also creates opportunity in the non-basic sector considering the rational productivity. Productivity shows the potential of any industry. Future projection of productivity paves the future policy instruction having strong basic sectors of the industry in the respective region.



Source: BBS Economic Census, 2001 and 2003 Zila series.

Figure10: Economic base multiplier for different sectors in different time periods

Figure 10 shows that if the sectoral employment generation keeps consistent pace with the passage of time, the sectors like textiles, RMG, basic metals and motor vehicle will be larger which means these sectors will be more productive in the coming year 2020.

Conclusion

Regional disparity in Bangladesh is very common. The industries having greater productivity are very centralized within the capital and some prominent regions. Some regions are self-sufficient in some sectors but the production and extension of those sectors in that respective regions are not adequate to meet up the employment demand of those regions. Centralization of major activities in the capital city is the prime reason behind that. Though some regions have basic employment of some productive sectors, forward and backward linkages of those sectors in those respective regions are not significant. So the regional disparity is increasing at an alarming rate. Different influencing factors behind the development of regions and sectors indicate that exclusive actions are needed from the authorities responsible.

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References

Banks, N. 2016. Livelihoods limitations: the political economy of urban poverty in Dhaka, Bangladesh: the political economy of urban poverty in Dhaka. Development and Change, 47(2), 266–292. https://doi.org/10.1111/dech.12219.

Blumenfeld, H. 1955. The Economic Base of the Metropolis: Critical remarks on the "basic - nonbasic" concept. Journal of the American Institute of Planners, 21(4), 114–132. https://doi.org/10.1080/01944365508979342.

Chowdhury, M. N. M. and Hossain. M. M. 2019. Population Growth and Economic Development in Bangladesh: Revisited Malthus (forthcoming), General Economics (econ.GN). Retrieved from https://arxiv.org/ftp/arxiv/papers/1812/1812.09393.pdf

Bangladesh Bureau of Statistics (BBS), 2013. Economic Census 2001 and 2003.

Garrison, C. 1972. The Impact of New Industry: An Application of the Economic Base Multiplier to Small Rural Areas. *Land Economics, 48*(4), 329-337. doi:10.2307/3145309

Glasson. J. 1975. An Introduction to Regional Planning. (2nd ed.). London, England: Hutchinson & Co (Publishers) Ltd

Global Edge, 2018. Bangladesh: economy. Retrieved from https://globaledge.msu.edu/countries/bangladesh/economy

Hoyt, H. 1961. The utility of the economic base method in calculating urban growth. Land Economics, 37(1), 51. https://doi.org/10.2307/3159349

Isserman, A. M. 1977. The location quotient approach to estimating regional economic impacts. Journal of the American Institute of Planners, 43(1), 33–41. https://doi.org/10.1080/01944367708977758.

Kuo. C. S. 2007. 2006 Mineral Workbook: Bangladesh. USGS. U.S. Geological Survey Minerals Yearbook—2006. https://minerals.usgs.gov/minerals/pubs/country/2006/myb3-2006-bg.pdf

Liton. R. I., Muhammad Islam, T., and Saha. S. 2016. "Present Scenario and Future Challenges in Handloom Industry in Bangladesh." Social Sciences, vol. 5, no. 5, 2016, p. 70. Crossref, doi:10.11648/j.ss.20160505.12.

Mintoo. A. A. 2004. SME's in Bangladesh: The Present and the future. TECH MONITOR, Sep-Oct 2004, Special Feature: Sustainable growth of SMEs.

Okubo, T. 2009. Trade liberalisation and agglomeration with firm heterogeneity: Forward and backward linkages. Regional Science and Urban Economics, 39(5), 530–541. https://doi.org/10.1016/j.regsciurbeco.2009.03.005.

Sam. Y. F. 2017. 2014 Mineral Workbook: Bangladesh. USGS. U.S. Geological Survey Minerals Yearbook—2014. https://minerals.usgs.gov/minerals/pubs/country/2014/myb3-2014-bg.pdf

Siddiqui, K., Ahmed, J., Siddique, K., Huq, S., Hossain, A., Nazimud-Doula, S. and Rezawana, N. 2016. *Social Formation in Dhaka, 1985-2005: A Longitudinal Study of Society in a Third World Megacity*. London and New York: Routledge. Retrieved from https://www.book2look.com/embed/9781317054009

Siriwardana, M. and Yang, J. 2007. Effects of proposed free trade agreement between india and bangladesh. South Asia Economic Journal, 8(1), 21–38. https://doi.org/10.1177/139156140600800102

Sonis, M., Guilhoto, J. J. M., Hewings, G. J. D. and Martins, E. B. 1995. Linkages, key sectors, and structural change: some new perspectives. The Developing Economies, 33(3), 243–246. https://doi.org/10.1111/j.1746-1049.1995.tb00716.x.

World Bank, 2019. Bangladesh overview. Retrieved from:

https://www.worldbank.org/en/country/bangladesh/overview