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Research · January 2020

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A Long Run Analysis of Regional Economic Structure of Selected Districts Using Shift Share Method

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Abstract

The study of structure of industrial sectors of a region is important to understand the growth and development of a region's economy. The national growth of a sector is a driving factor for progressing of that sector in a region. Shift Share analysis is a standard long run regional analysis technique for assessing the performance of sectors in regional economy. It highlights the performance of a region's mix of industries and uniqueness of a regional economy. This study seeks to quantify how much of the growth of an industry of a region is attributable to national growth and how much is proliferated by locational factors using Shift Share Components. Employment data of thirteen sectors from "Economic Census-2003 and 2013" report has been analyzed for seven districts of Barisal and Chittagong division. The comparative analysis of the selected districts reveals that Hotel and Restaurant sector is flourishing in all of the districts for both positive influence of external and internal factors while Real Estate and Renting, and Transport, Storage and Communication activities has been lagging for all the districts. All of the districts, except Bhola and Pirojpur would become economically weak in the long run, while Rangamati district is in economic malaise relative to the other districts. Thus, Shift share would be useful for the regional planners to set investment targets by identifying high-performing regional industries.

Keyword: Economic Structure, Shift Share, National growth, Locational factors, Long Run Growth

1. INTRODUCTION

Regional economic structure is defined as the composition and patterns of various components of the regional economy such as production, employment, consumption, trade, and gross regional product (Thakur, 2011). Regional economic structure is useful for explaining regional economic change, predicting the implications of economic decisions and forward planning (Glasson, 1974). The economy of a region predominantly depends on the strength

and weakness of different industries existing within it, the dynamics of industrial structure, and its unique regional factors (Islam et al., 2015). Usually, a region's economy develops when the sectors of the region develop with time.

Economy of Bangladesh has experienced both macro-economic stability and robust economic growth following the transition to a democratic rule in the early of 1990s (Bhattacharya, n.d.). But, spatial inequality is prevalent across different regions of Bangladesh in terms of

economic growth and development (Rahman, 2005). The regions are specialized in some selected industries based on their location, availability of raw materials, availability of utilities, and availability of skilled labor, marketplace and so on.

The variation between national and regional industrial structure and availability of the local resources contribute to the regional economic growth. Shift Share is a simple and popular regional analysis method that seeks to estimate how much of regional employment growth can be attributed to national trends and how much is due to unique regional factors. Therefore, a shift-share analysis is one way to account for a region's competitiveness, which shows a picture of how well a region's mix of industries is performing. Besides, it provides a picture of how well individual industries are doing in the long run. This paper aims to identify the regional competitiveness based on industrial sectors, and find out the regional employment growth of the selected districts and their contribution to shift share components.

2. LITERATURE REVIEW

Long run regional growth theories can be subdivided into aggregated and disaggregated approach. Shift Share method proposed by Dunn (1960), is a disaggregated approach, which is very simple and widely popular techniques for regional development giving pertinent insights into economic changes (Hodgkinson, 2005). The method attempts to determine how much of regional job growth can be attributed to national trends and how much is due to unique regional factors. It helps answer why employment is growing or declining in a regional industry or occupation.

In Shift Share method of long run regional analysis, economic growth is explained by the combined effect of two components: Shift Component and Share Component. National Share implies how much of the regional industry's growth is explained by the overall growth of the national economy. Shift Components are deviations in regional economic growth from the national share. The Shift Components sort out the exogenous and endogenous factors triggering the regional growth. The shift component can be subcategorized as Proportionality Shift Component and Differential Shift Component.

Proportionality Shift Component (also known as Structural or Industrial Mix Component) identifies fast growing or slow growing industrial sectors in a local area based on the national growth rates of individual industrial sectors. The component is positive in areas specializing in nationally fast growing sectors and negative in areas specializing in nationally slow growing sectors. The leading and lagging industries of the region can be sorted out which have positive and negative differential shift components respectively. A region with locational advantage for a specific industry would yield positive differential component and vice versa (Glasson, 1974).

Several studies analyzed the long run regional growth of industrial sectors. Kalbacher have developed modified version of shift-share methodology to represent the growth performance of individual industries of a region by percentage instead of traditional approach. It can be useful to compare and appraise past and present economic growth patterns of regions (Kalbacher, 1979). Kiser (1992) and Islam et al. (2015) used Shift Share method for the analysis of regional economies of Texas and Bangladesh

respectively. For Shift Share analysis, Kiser (1992) examined the period 1988 to 1991 using average annual employment data while Islam et al. (2015) used gross divisional product at constant price for the year 1995-96 to 1999-2000. Fishing, Construction, Manufacturing, Wholesale and Retail Trade and Education are performing well in all the six divisions in Bangladesh (Islam et al., 2015). Health, manufacturing and educational services gained the most in competitive share among the industries in Texas (Kiser, 1992).

3. METHODOLOGY OF THE STUDY

Seven districts are selected for the study (Figure-1). The selected districts are Barisal, Bhola, Patuakhali, Pirojpur, Jhalokati, Rangamati, and Bandarban. Barisal, Bhola, Pirojpur, Patuakhali, Jhalokati are under the jurisdiction of Barisal Division while Rangamati and Bandarban are in Chittagong Division.

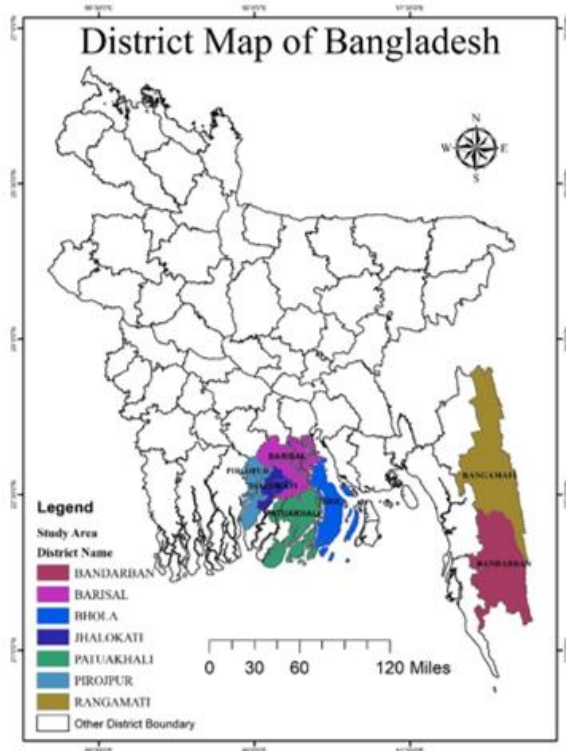


Figure 1: Study Area Map (Source: Prepared by Author)

Barisal division is located in southern part of Bangladesh, and Chittagong division is in the southeast part of Bangladesh. The districts of Barisal division are included in Coastal Region while Rangamati and Bandarban belong to Chittagong Hill Tract Region.

The employment data of both 2003 and 2013 of 13 industries for selected districts are collected from Economic Census 2003, and 2013 of BBS. The National Share Component (NS), Industrial Mix (IM), Regional Shift (RS), and Net Shift value for each industry of the selected districts have been calculated using the following equation to analyze the industrial structure-

$$\text{National Share, } NS_r^t = E_{ir}^{t-1} \times \left(\frac{E_{iNational}^t}{E_{iNational}^{t-1}} - 1 \right)$$

$$\text{Industrial Mix, } IM_r^t = E_{ir}^{t-1} \times \left(\frac{E_{iNational}^t}{E_{iNational}^{t-1}} - \frac{E_{iNational}^t}{E_{iNational}^{t-1}} \right)$$

$$\text{Regional Shift, } RS_r^t = E_{ir}^{t-1} \times \left(\frac{E_{ir}^t}{E_{ir}^{t-1}} - \frac{E_{iNational}^t}{E_{iNational}^{t-1}} \right)$$

Net Shift = Industrial Mix + Regional Shift

Here; r = Specific region; i = Specific industry, t = Current time period, t-1 = Previous time period; E = Employment in i industry of r region

Net Shift component represents any deviation in regional employment growth from the national share. It is positive in prosperous growth areas, and negative in relatively depressed areas.

4. RESULTS AND DISCUSSION

Overall Scenario of Shift Share Components of Selected districts

Table 3: National Share of different sectors in selected districts from 2003 to 2013

District Sector	Barisal	Bhola	Jhalokati	Patuakhali	Pirojpur	Rangamati	Bandarban
Mining and Quarrying	8	N/A	N/A	N/A	109	N/A	N/A
Manufacturing	21477	7405	3743	7834	6576	8711	5763
Electricity, Gas and Water Supply	571	306	44	63	177	34	5
Construction	112	204	8	111	47	11	281
Wholesale & Retail Trade	61714	37817	13713	37280	24392	19546	7850
Transport, Storage and Communication	17276	8214	3694	6614	4581	4339	2696
Hotel & Restaurants	1797	537	321	646	695	456	276
Bank, Insurance and Financial Institutions	4029	2074	1391	2430	2030	1525	583
Real Estate and Renting	1498	1030	475	1779	1217	229	226
Public Administration and Defense	4979	3359	1252	2482	2642	15067	6909
Education	17623	11737	6869	13204	10555	4669	2619
Health and Social Work	6099	1877	785	1133	1754	1370	789
Community, Social and Personal Services	17354	8423	5086	9112	7158	4677	2276
Total	1,54537	82,983	37,380	82,687	61,933	60,634	30,273

(Source: BBS, 2003; BBS, 2013)

It is apparent from the Table-3 that if the regional industries had grown with national average growth rate of industries, then how many new job would have created in each districts. From that point of view, district like Barisal, Bhola, and Patuakhali have the highest expected number of employment that would have grown. For majority of the districts, this expected increase in employment is contributed largely by the sectors like Wholesale and Retail Trade, Education, and Manufacturing. In contrast, sectors like Mining and Quarrying Electricity, Gas and Water Supply, and Construction have lower contribution to the expected job growth.

Form Table-4, it is apparent that, majority of the industries have negative IM value. IM Component of Construction; Wholesale and Retail Trade; Transportation, Storage and Communication; Real Estate Renting; Health and Social Work; Education ; and Community, Social and Personal Services sectors are showing a declining trend as these sectors are not growing as fast as the national average. Growth rate has decreased due to major changes in industrial policy, trade policy, monetary and fiscal policy, exchange rate policy, and foreign investment policy (Islam et al., 2015).

Table 4: Industrial Mix of Different Sectors in selected districts from 2003 to 2013

Sector \ District	Barisal	Bhola	Jhalokathi	Patuakhali	Pirojpur	Rangamati	Bandarban
Mining and Quarrying	26.14	N/A	N/A	N/A	372.43	N/A	N/A
Manufacturing	16144	5566.5	2813.39	5888.80	4943.4	6548.53	4332.43
Electricity, Gas and Water Supply	252.43	135.08	19.42	27.86	78.09	15.20	2.11
Construction	-90.24	-165.06	-6.17	-89.47	-37.79	-9.26	-226.76
Wholesale and Retail Trade	-15850	-9713	-3521.98	-9575.01	-6264.9	-5020.15	-2016.20
Transport, Storage and Communication	-26595	-12645	-5686.69	-10182.54	-7052.5	-6679.07	-4150.35
Hotel and Restaurants	5900.6	1762.0	1053.46	2119.46	2282.5	1495.54	906.10
Bank, Insurance and Financial Institutions	-1027	-529.10	-354.92	-619.96	-517.89	-389.03	-148.84
Real Estate and Renting	-2485	-1709.2	-787.31	-2951.24	-2018.2	-380.19	-375.44
Public Administration and Defense	3054.6	2060.4	768.05	1522.63	1621.0	9242.97	4238.63
Education	-3709	-2470.1	-1445.73	-2778.90	-2221.3	-982.65	-551.12
Health and Social Work	-889.8	-273.79	-114.53	-165.25	-255.96	-199.95	-115.09
Community, Social and Personal Services	-3901	-1893.6	-1143.43	-2048.35	-1609.1	-1051.33	-511.60

* Gray color represents the positive RS component and white color represents negative RS component. (Source: BBS, 2003; BBS, 2013)

On the other hand, very few sectors like Manufacturing; Electricity, Gas and Water Supply; Hotel and Restaurants; Public Administration and Defense are growing faster than the national average. Increasing ADP allocation would be the underlying reasons for nationally fast growing sectors. Public Administration and Defense sector got only 1.27 percent of ADP allocation in 2000-01 while it increased to 24.2 percent in 2013-14 (Banglapedia, 2018). This increasing ADP allocation may help to module this sector as a nationally fast growing one. Bangladesh is currently experiencing rapid growth in its urban

population. In 2000, the urban population was 23.7 percent of the total population while the figure reached 34.1 percent of the total population in 2015 (Worldmeters, 2018). Because of increasing trend in the level of urbanization, sectors like Manufacturing; Electricity, Gas, and Water Supply may be identified as nationally fast growing sectors (Table-4).

Table 5: Regional Shift of Different Sectors in selected districts from 2003 to 2013

Sector \ District	Barisal	Bhola	Jhalokati	Patuakhali	Pirojpur	Rangamati	Bandarban
Mining and Quarrying	-36.78	N/A	N/A	N/A	-529.30	N/A	N/A
Manufacturing	-19005.2	473.57	204.02	-6651.55	2069.62	-11147.92	-7828.77
Electricity, Gas and Water Supply	162.48	-297.68	-42.35	163.11	389.23	149.42	76.11
Construction	345.51	-229.31	-9.47	-97.31	30.00	58.80	-332.01
Wholesale and Retail Trade	8778.67	33603	-7526.67	-21308.79	6994.69	-9460.55	2206.2
Transport, Storage and Communication	-5376.97	-2206.7	-1218.19	-943.70	-283.57	-1397.43	-664.6
Hotel and Restaurants	17334.09	10328	7069.67	13200.97	7500.28	2919.94	4389.9
Bank, Insurance and Financial Institutions	2561.66	-130.13	-214.49	2092.52	855.59	-306.08	179.34
Real Estate and Renting	-342.87	-320.15	-173.31	-671.90	-430.46	-83.00	-51.89
Public Administration and Defense	310.07	-3334.1	-270.04	126.36	-684.50	-23513.79	-12379
Education	-2448.23	-1482.6	-3003.49	-4526.74	-2931.2	6220.72	3738.6
Health and Social Work	-4860.75	-957.76	-219.47	282.64	599.65	-643.46	-330.73
Community, Social and Personal Services	545.32	1896.5	-2749.82	2909.82	1030.47	-2157.24	1417.9

* Gray color represents the positive RS component and white color represents negative RS component. (Source: BBS, 2003; BBS, 2013)

From Table-4 and 5, it is visible that Hotel and Restaurants sector is outperforming the national trends (both overall national trends and national trends in that specific industry) in all the seven districts for the composition of industries and unique advantage that each districts possess. It

is because the importance of tourism sector has increased overtime to ensure economic development. In 2009-2010, 83.8 million TK. was allocated for tourism sector from national budget. This has been increased to 181.8 million TK. in

2011-2012 (Roy & Roy, 2015). Hotel and Restaurants are being constructed due to the improvement of tourism in the districts like Patuakhali, Barisal, Rangamati, and Bandarban (Islam, 2016). Barisal is generating more employment (RS value 17,334) than other districts in this sector due to high urbanization rate (Table-5).

Table 6: Urban Population of the districts

Districts	Urban Population	Urban Population	Growth of urban population
Barisal	519016	394567	31.5
Bhola	243317	234302	3.2
Jhalokati	112003	104070	7.6
Patuakhali	201882	175284	15.2
Pirojpur	182631	166970	9.4
Rangamati	159627	170188	-6.02
Bandarban	100423	92766	8.2

**Bold word represents highest growth of urban population (Source: BBS, 2001; BBS, 2011)*

However, in case of Transportation, Storage and Communication and Real Estate and Renting, the employment growth is underperforming than the national trend for all the seven districts. Besides, these sectors are showing a declining trend nationally and going through a recession period, as there is a lack of long-term investment and inadequacy of Annual Development Program (ADP) (Islam et al). For Transportation, Storage and Communication sector, ADP allocation has

declined from 17.5% to 6.67% during 2000-2010 (Banglapedia, 2018). Comparing with investment of all other districts of the country, concerned districts under this study got less amount of ADP allocation (Tarannum & Zaman, 2017). Additionally, locational characteristics like the entwining rivers, canals, hills (Bandarban and Rangamati) may also be the reason for which the sector cannot be flourished in these districts.

In Barisal, Jhalokathi, Patuakhali, Bandarban, and Pirojpur, Hotel and Restaurants sector is contributing highest number of jobs while it is wholesale and Retail Trade in Bhola and Education in Rangamati, which are generating maximum number of employment for the unique advantage that each districts possesses. Regional competitiveness was negatively affected by Public Administration and Defense in Rangamati and Bandarban; Transportation, Storage and Communication in Barisal and Bhola; Wholesale and Retail Trade in Jhalokathi and Patuakhali; Education in Pirojpur in greater amount due to internal factors of the concerned districts

Long Run Regional Competitiveness Analysis

From Figure-3, it is apparent that the national share component has the major impact on total regional employment growth in all the districts. More than 80% employment growth of Barisal district has been generated because of national employment growth. It has been found that Bhola has highest positive share of RS value while Rangamati has the lowest share due to internal locational factor occurring locally. IM component has a negative impact on the employment growth for all the districts except Rangamati and Bandarban.

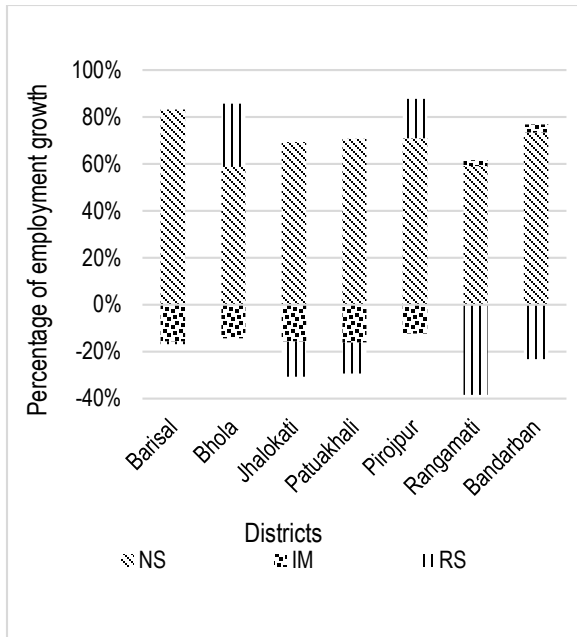


Figure 3: District-wise contribution to regional employment growth (Source: BBS, 2003; BBS, 2013)

From Figure-4, Barisal is experiencing the largest change in regional employment though the industries of this district are underperforming the national average (both overall national average and national average in specific industry). Bhola has the second highest change in regional employment with negative IM but highest positive RS. It implies that Bhola may experience a boom in regional employment in the long run due to the influence of locational factors. In Rangamati, a loss of 39,360 jobs is due to locational disadvantages, which is the main reason for lower change in regional employment.

From Figure-5, it is apparent that none of the districts has positive IM and RS contribution to the growth of regional employment simultaneously, while these components are negative for Barisal, Jhalokati, and Patuakhali districts. That means, these districts mostly consist of sectors having slow growth rate compared to the national average and prevailing locational disadvantages. Rangamati has the

lowest regional employment growth rate mainly for extreme negative impact of regional factors while the growth rate is highest in Bhola and 37.2 percent of the growth is attributed to the unique locational advantages of this district.

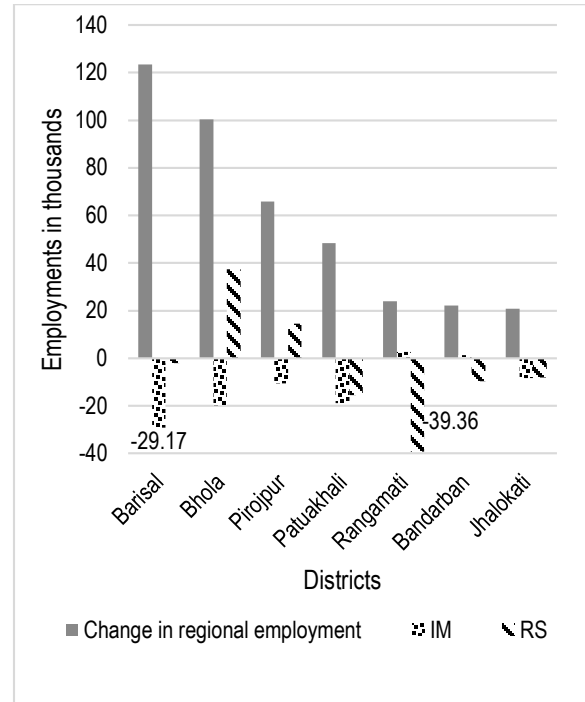


Figure 4: Comparison of change in regional employment with RS and IM across the sectors of the districts (Source: BBS, 2003; BBS, 2013)

From Figure 4 and 5, though Barisal has the highest change in regional employment, it has relatively lower regional employment growth rate comparing Bhola and Pirojpur districts. In Barisal, the negative influence of external factors operating nationally (a loss of 17% jobs) is the main reason for the lower regional employment growth. From Figure-6, Bhola and Pirojpur have positive Net Shift value of employment, while rest of the districts show negative shift. So, Bhola and Pirojpur can be attributed as prosperous growth areas. While, Net Shift component showed highest negative value in districts like Rangamati, Patuakhali, and Barisal for which these areas can be identified as relatively depressed areas.

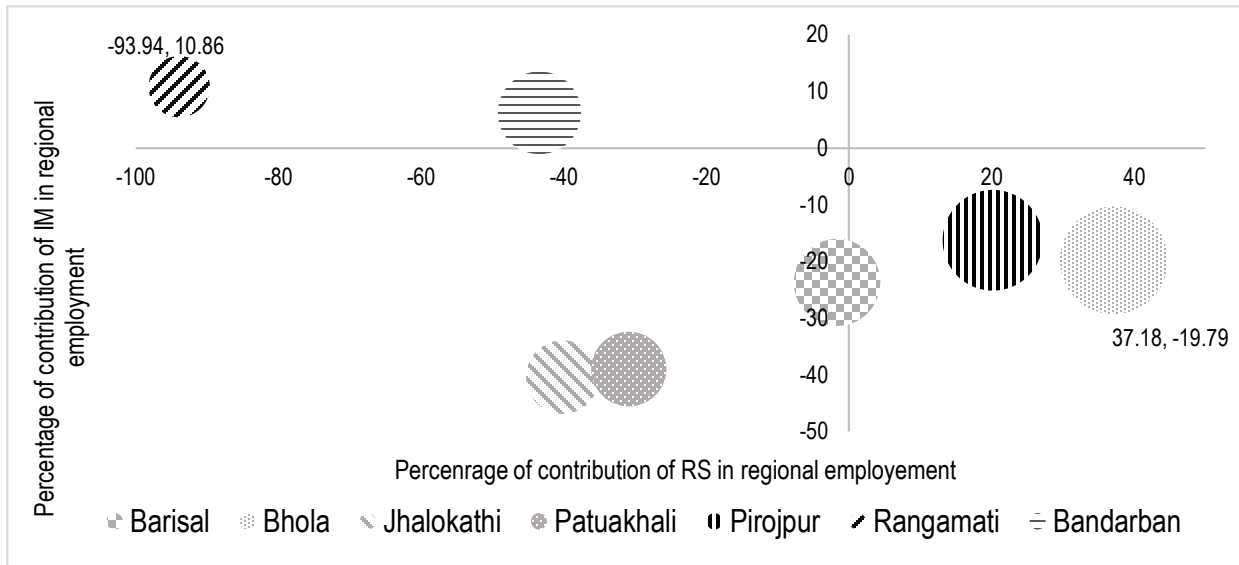


Figure 5: Comparison of regional employment growth with contribution of RS and IM of the districts (Source: BBS, 2003; BBS, 2013) *Size of the bubble represents regional employment growth rate 2013

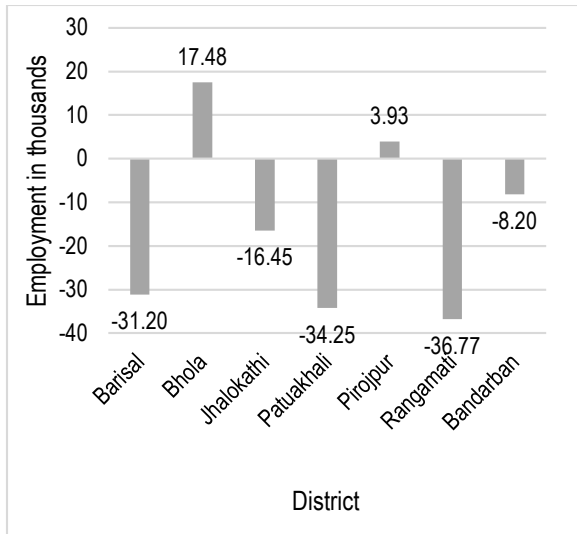


Figure 6: Net Shift of the selected districts
(Source: BBS, 2003; BBS, 2013)

5. CONCLUSION

Regional economy and the industrial sectors are closely related to each other. The economic strength of a region depends on the strength of the industrial sectors. This study reveals how much of the growth of an industry of a region is attributable to national growth and how much is proliferated by locational factors using Shift Share Components. The study also explores the nationally fast and slow growing industries to identify the thriving and depressed regions. If the composition of the industries in a particular region consists of nationally fast growing industries, then the overall economy of the region is strong. Again, if an industry in the region have higher growth rate than the industrial growth rate, then the region is also developed due to its local factors. However, it may be incorrect to assure that regions with poor RS would benefit from improved locational advantages and that a region with poor IM requires an injection of new growth industry. However, the study found that Bhola and Pirojpur are becoming economically prosperous in the long run while Rangamati

district is the most depressed one. This would be useful for the regional planners to set investment targets.

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