
Industrial policy for promoting industrial growth in Sri Lanka: Shift share analysis

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Introduction

A number of government entities and regional growth promoting institutions stand for a key challenge of economic development as high inequality among the provinces. In terms of industrial sector, a high inequality is prominent in comparison to the Western province and other regions given the fact that regional growth promotion is vital and renowned for economic growth; non-agricultural employment change in the industrial sector has not been studied properly. Because, 77 percent enterprises are located in the Western province known ... as "industrial pocket"- high industrial concentration in Western province (Central Bank of Sri Lanka, 2016), the proposed research intended to identify the growth promoting labour dynamics and structural adjustment to endorse local economic development in Sri Lanka. In terms of policy perspectives, understanding industrial growth pattern of the Western province and industrial movement towards the growth of the overall industrial sector, and spatial distribution of the industrial groups in the country and their performance in the region for the inclusive growth of the industries will be significant in policy development in this empirical study. The present study contributes to the regional industrial growth planning and policy making, and employment growth and changes of the industrial growth. In terms of use of shift-share analysis for regional policy planning, this research contributes significantly to the economic development of the country.

Accordingly, the following objectives are accomplished by shift share analysis:

- To evaluate the performance of different sectors in the Western province's economy relative to Sri Lankan economy.
- To estimate the level of employment growth experienced by Western province's economy accounted for the national growth rate.
- To estimate the degree of the employment growth experienced by Western province's economy accounted for the mix of industries in Western province's economy.

Methodology

Secondary data from the Central Bank of Sri Lanka and Department of Census and Statistics of Sri Lanka are gathered for quarterly labour force survey from

1997 to 2015. Data from fourteen industrial groups in Sri Lanka (based on ISIC Third Revision) classified are gathered for nine provinces.

The shift-share accounting framework, which decomposes total growth in a region in terms of national, industry-mix, and competitive shift effects, provides a dynamic perspective on the shift-share decomposition. Moreover, it addresses new structural change effect to show that most provinces have been creating jobs in industries that nationally became more prominent and shed jobs in industries that contracted nationally. Shift-share analysis is used in analyzing employment growth in a region over a specific period of time (Barff & Prentice, 1988; Esteban, 2000; Hoppes, 1991; Knudsen, 2000; Wilson & Su, 2005).

It decomposes regional growth into three distinct effects for better analyses of employment growth. The three distinct effects are: (1) National Shift/National growth effect (NS), which is the part of the change in total employment in a region ascribed to the rate of growth of employment at the national level; (2) Industrial mix effect (IM), which is the amount of change the region would have experienced if each of its industrial sector had grown at the national rates, less the national growth effect; and (3) Regional Shift/competitive effect (RS), which is the difference between the actual change in employment and the employment change to be expected, if each industrial sector grows at the national rate. The sum of these three effects gives the actual change in total employment within a region over a considered time period.

Results and discussion

Changes of the all industries in Sri Lanka: Among the industrial employment change, the following industries are increased the employment growth; Manufacturing of food products and beverages; Manufacturing of wearing Apparel, dressing & dyeing of fur; and Manufacturing of rubber and plastic products show the increase of the industrial growth. However, it further shows that Manufacturing of chemicals and chemical products; Manufacturing of other non-metallic mineral products, and Manufacturing of basic metals industries are reduced the growth.

Changes of the industries in Western Province: A drastic difference of the employment growth can be observed between Western Province's industries and national industrial growth. The negative changes in Western Province industries are Manufacturing of Textiles; Manufacturing of rubber and plastic products; Manufacturing of motor vehicles, trailers and semi-trailers. The total employment of the manufacturing industries has reduced by 57.3 percent from 856, 432 to 365, 908 during 1997 to 2015 in Western province.

Decomposition of labour productivity growth;

(a) Overall Sri Lanka's industrial employment decreased by an average of 1.6 percent per year between 1997 and 2015, higher than the 1.1 percent per year in the preceding five years. The overall change in the decomposition shows that national share is -469602.22 with industry mix -33263.87 and regional shift -20921.77 and total change of employment is -490524. Overall labour growth in the last five-year period was supported by productivity improvements in the various sectors, but weighed down by a shift in employment towards less productive sectors.

(b) *Within effect*: Over the last five years, the growth retardation in various sectors contributed 1.2 percentage-points to overall employment growth each year. This was lower than the 1.4 percentage-point contribution each year in the earlier five years.

(c) *Static shift effect*: The static effect shows that a shift in employment towards less productive sectors in the last five years, with the employment shares of less productive sectors growing relative to that of more productive sectors. The negative static shift effect dragged overall growth down on average by 0.35 percentage-points each year.

National share (NS) effect: Had the Sri Lanka's manufacturing industry grown at the same rate as the national average? It shows that there were 567,170 less workers in 2015 compared to 1997. So, it explains the loss of 688,531 jobs in the national share of national employment mainly driven by the service sector. The national growth effect (NGE) shows employment growth that would have occurred if a sector in a regional or local economy had grown at the same rate as the national economy. Regarding Western province, national growth effect in all sectors is negative. The NGE explains degree of the Western province industry's growth is explained by the overall growth of the national economy: if the nation's whole economy is growing, some positive change can be expected to see in each industry in the Western Province. A distinguished variation of the industries in national share can be observed. Almost all industries have shown a negative growth in the industrial development.

Industry mix (IM) effect: The industrial mix effect represents the share of regional industry growth explained by the growth of the specific industry at the national level. Difference between a particular industry's growth rate and the national average in employment data shows that, nationally, manufacturing employment declined even though overall employment decreased. Industry-mix effect of industries show that the manufacturing of food products and beverages, manufacturing of other non-metallic mineral products, manufacturing of medical, precision and optical instruments, watches from 1997-2015. It implies that a better environment for manufacturing industries does not exist. The industrial mix effect measures the amount of local or regional employment sector growth

compared to the national employment growth. It can be used in identifying the fast or slow growing sectors or industries in an economy. A negative industrial mix effect in a particular local employment sector indicates that it is growing slower than the national economy. The industrial mix effect for the total employment sector also indicates a negative value for the period of 1997 to 2015, showing that the growth of Western economy is slower than the overall economy.

Table 1 Total change in industries from 1997-2015

Top 4 Leading Manufacturing Industries (1997-2015)	Top 5 Lagging Manufacturing Industries (1997 - 2015)
1. Manufacturing of motor vehicles, trailers and semi-trailers	1. Manufacturing of wearing Apparel, dressing & dyeing of fur
2. Electricity, Gas, Steam and Hot water supply	2. Manufacturing of food products and beverages
3. Manufacturing of rubber & plastic products	3. Manufacturing of food products and beverages
4. Manufacturing of coke refined petroleum products and nuclear fuel	4. Manu. of other non-metallic mineral products
	5. Manufacturing of chemicals & chemical products

Regional shift (RS) effect: The difference between the national share and industry mix is the regional shift. It indicates that local conditions were responsible for the national competitive position in manufacturing. Table 1 shows that one sector is very interesting; manufacturing of wearing apparel, dressing and dyeing of fur. It explains how much of the change in a given industry is due to some unique competitive advantage that the region possesses, because the growth cannot be explained by national trends in that industry or the economy as whole. The effect is negative similar to the regional employment in the industry declines.

Conclusion and policy implications

The study presents a review of regional industrial growth using shift share analysis for planning regional economies for fostering industrial growth. In this analysis, the values were estimated for different industries that provide an overview of the industrial growth pattern for industrial polices. The results show that Sri Lanka's industrial employment grew slower in the last eight years, 1997 to 2015. Not only the national growth of industries but also the western province's industrial growth has also been decreasing at an alarming rate due to failures in industrial growth. All effects of the shift share revealed a negative growth implying that the growth of industries in the last few years was not supported by within-sector improvements in economy. The results clearly indicate that the Western province's manufacturing industry is slower and

decreasing its national growth during this period, 1997-2015. Based on the identification of leading and lagging industries, this analysis suggests that industrial growth promoting policies need to be adjusted for the regional growth as well as national growth bringing more leading manufacturers into the economy. These results, thus, suggest that in efforts to raise growth and productivity of industries, it is important not just to drive industrial growth and shift, but also to restructure the economy towards more productive industries with proper regional planning.

Keywords: *Development planning, employment growth, industrial policy, regional economy, shift-share.*

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Appendix

Shift-share Method: $SS = NE + IM + CE$

Shift-Share = NE National Share + IM Industry Mix + CE Competitive Effect

$$\Delta E_{ir}^t \equiv E_{ir}^t - E_{ir}^{t-1} \equiv NE_{ir}^t + IM_{ir}^t + CE_{ir}^t$$

Where

$$NE_{ir}^t = g_{00}^t \times E_{ir}^{t-1}$$

$$IM_{ir}^t = (g_{i0}^t - g_{00}^t) \times E_{ir}^{t-1}$$

$$CE_{ir}^t = (g_{ir}^t - g_{i0}^t) \times E_{ir}^{t-1}$$

The terms in the above shift-share equations are defined as:

E_{ir}^{t-1} = Employment in the i^{th} industry in the r^{th} region at time $t-1$.

E_{ir}^t = Employment in the i^{th} industry in the r^{th} region at time t .

NE_{ir}^t = National Growth Effect on industry i in the r^{th} region between $(t-1)$ and t .

IM_{ir}^t = Industry-Mix Effect on industry i in the r^{th} region between $(t-1)$ and t .

CE_{ir}^t = Competitive Effect on industry i in the r^{th} region between $(t-1)$ and t .

g_{ir}^t = Growth rate of employment in industry i and region r between $(t-1)$ and t .

g_{i0}^t = Growth rate of nationwide employment in industry i between $(t-1)$ and t .

g_{00}^t = Growth rate in nationwide total employment between $(t-1)$ and t .