ORIGINAL ARTICLE

Evaluating urban employment dynamics in selected secondary cities of Ethiopia: A shift-share analysis

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Abstract

Policymakers and municipal authorities need up-to-date information about industrial health in terms of employment changes, to make informed decisions. The purpose of this article is to analyze urban economic change focusing especially on the employment dynamics in selected secondary cities of Ethiopia for the period of 2014-2018, using shift-share analysis. The data used for this study was drawn from the Urban Employment/Unemployment Survey of the Central Statistical Agency of Ethiopia. The study employed shift-share decomposition as an analytical framework. The study has identified the locally and nationally growing; locally growing but nationally declining; locally declining but nationally growing; and locally and nationally declining industries in the study cities. The manufacturing sector appears to have a strong place in Bahir Dar, Hawassa, Dire Dawa, and Adama cities as shown in their employment growth because of the structural and differential effects. Five study cities are gaining employment in education; three in construction and two in wholesale and retail trade; and accommodation and food services. The analysis points to the sectors that are gaining or losing employment because of structural and/or competitive share effects. Thus, improving the infrastructure, and developing productive industries would help keep up the growth of industries in these cities.

Keywords: *Urban Employment Dynamics, Secondary Cities, Shift-Share Analysis*

1. Introduction

Secondary cities are vital components in the national urban system as key parts in overall national economic development (UN-Habitat, 2011; Ingelaere, et al., 2017). They perform essential functions in the national and global systems of cities (Roberts, 2014). But it is hard to have a universally agreed definition of secondary city. According to UN-Habitat (1996:13), a secondary city is an urban area with a total population ranging between 100,000 and 500,000. However, the definition of secondary cities varies in time and space and in terms of criteria. For example, in Southeast Asian cities, a secondary city could have a population of up to a 2.5million, in China up to 5 million. Hence, it is evident that the definitions of secondary cities take different criteria into account. Scholars such as Song (2013); Roberts (2014) agree that secondary cities form part of the orders, or systems, of cities in the national or global systems of cities. Studies on secondary cities

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can put forward useful insights into the urban-development policies, planning actions, infrastructure, investment, and resources needed to support their management and roles in national economic development (Roberts, 2014). In this study, secondary cities refer to the second-tier level of a hierarchical system of cities in the national urban system based on the population size alone. They perform one or more of the following functions such as sub-national administrative headquarters or transport hubs or industrial and commercial centers or religious, cultural, and educational centers.

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Secondary cities play a significant role in the New Economic Geography (NEG) of cities and national and global urban systems in both developed and developing countries (Roberts, 2014). They form an essential link in maintaining an efficient networked system of cities and also rural-urban linkages. Much empirical evidence points out that urbanization and economic growth are interlinked (UN-Habitat, 2011; Turok & Mcgranahan, 2013; UNECA, 2018). Secondary cities could offer enormous efficiency benefits which would bring about unrivaled positive outcomes in productivity and competitiveness. They have enormous potential as a medium for inclusive growth and poverty reduction in developing countries that undergo rapid urbanization (Ingelaere, et al., 2017). Thus, being centers of knowledge, innovation, and specialization of production and services, secondary cities could foster innovation, growth, and creativity (UN-Habitat, 2011; Roberts, 2014). As it is true in primary cities, their function could further explain the benefits of secondary cities as centers of localization and urbanization economies (Turok and Mcgranahan, 2013).

Many secondary cities in the developing countries are grappling with managing urbanization (UN-Habitat, 1996). They are faced with the challenges of attracting investment, creating employment, and satisfying the growing demands for housing, infrastructure, and services (Roberts, 2014). For achieving sustainable growth and development of secondary cities, there is a need to focus on investigating and understanding the key drivers that add force to their development. Understanding employment changes in secondary cities is vital for monitoring economic change and taking actions to promote stronger economies. For this, analytical tools are required to evaluate the performance of cities over time regarding industrial employment dynamics on a variety of indicators (Dinc, 2015). One tool which is widely used to assess urban or regional economic or employment change is a shift-share analysis.

According to Dinc (2015), shift-share analysis is a simple and low-cost technique for assessing urban and regional economic performance, both growth and decline. It enables the analysis of urban and regional performance relative to other urban centers and regions. It is a dynamic approach as it uses data for two points in time and assesses the observed change of industry over a period. As to shift-share decomposition, the underlying factors for industrial employment change may be because of pure local or regional or national factors. To investigate the future trends of various industries, it is crucial to identify the factors that determine the level of the change (growth and decline) over a period, across various spatial scales-local, national or regional. It is critical to identify whether the observed change across cities arose from compositional or structural factors or city-specific local competitiveness (Dinc, 2015). There is a rarity of studies on employment change using shift-share decomposition in Ethiopia. The available studies, for example, Temam and Rao (2017) used only location quotient and focused on identifying the basic and non-basic sectors and classifying urban centers based on functions. However, the policymakers and municipal authorities may need such up-to-date and comprehensive information regarding employment changes to take appropriate actions.

This study evaluates urban economic change by analyzing employment change in major industries in six secondary cities of Ethiopia for the period of 2014-2018, using shift-share decomposition. This period more or less coincided with the political unrest which caused many crises in the country. During this period, ethnic conflicts arose across the country which led to numerous internally displaced populations (IDPs) and the destruction of various industries, institutions and properties (UNOCHA, 2018). In Ethiopian national urban system, secondary cities mean second-tier cities serving as centers of administration, manufacturing, services, transport, and communication, education, health, or a mix of different functions. They are playing important roles in the industrial development causing a gradual decline in the share of the capital Addis Ababa i.e. its primacy effect. Moreover, these cities are now becoming alternative investment destinations due to their comparative and competitive advantages.

The main purpose of the article is to evaluate the performance of sectors in selected six secondary cities of Ethiopia. The study argues that the leading industries in cities change over time because of national, structural, and local effects. Thus, monitoring the performance of cities using economic indicators such as employment dynamics in industries is of vital importance for making informed decisions. Thus, the significance of this study is that municipal and city authorities would use the output of the study to inform policy and practice, to identify and target priority industries in those cities.

2. Research Questions

This study addresses the following questions:

i) What proportion of employment change in selected secondary cities' major industries could be explained through the observed trend in overall growth (national growth effects)?

ii) What part of the change in city employment in industries can be attributed to the fact that industries in the nation might grow faster or slower than the observed trend in overall change of the nation (structural or compositional effects)?

iii) Which industries are growing because of local factors in these cities over the study period (differential or competitive effects)?

3. Theoretical and Empirical Review

The economic base theory assumes that a regional or local economy has two sectors. These are basic (city-forming) and non-basic (city-serving) sectors. The first one is very important for cities and regions as it helps inject income from outside the region or a city by exogenous inflow. The second one satisfies local demand which is referred to as a ripple effect. The growth in the basic sectors has a multiplier effect on the non-basic sectors (Dinc, 2015).

Various approaches have been used to analyses urban and/or regional economic change. Shift-share analysis is one of the most commonly used techniques (Haynes and Parajuli, 2015). It is one of the tools of location theory and decision analysis (Chan, 2011). It has been used since the 1960s to analyze the economic and industrial performance of a region relative to other regions and to decide the relative significance of a specific industry in the region (Dinc, 2015). Recent trends in the shift-share analysis show that it has been

used analyze various issues. For instance, it has been applied in the analysis of changes in electricity consumption (Grossi and Mussini, 2018); energy consumption (Lin et al., 2019); labor productivity inequality (Mussini, 2018); impacts of redevelopment projects (Joseph et al., 2017; 2019) and cancer incidence (Michael, et al., 2019).

It is imperative that the shift-share analysis used by geographers, economists, regional scientists, and urban planners to focus not only on the regional change but also the regional shift or the competitive or comparative position of the industry. The shift-share analysis decomposes the change in employment into national growth, industry mix, and regional competitive share components. Scholars usually refer to the national growth and industry mix as the 'share portion'; whereas, the competitive effect is the 'shift segment' of the technique. The former assesses urban employment change that could have occurred when the city's employment had grown at the same rate as the nation or the sum of all urban centers in a nation. Interpreting the results of the national growth effect is straight forward and simple. It tells how many jobs in an industry are attributed to national growth. It, therefore, standardizes the growth in city employment that may be because of the overall situations and trends of the nation (Dinc, 2015).

The industry mix (IM) component tests proportional shift that happen because of a difference in industry growth between the city/region and the nation. It measures the change of the city's industrial sectors in terms of change at the national level. Hence, on the national trend, if a city has more rapidly growing or slowly growing sectors, the structural effect assumes a net positive or negative trend (Haynes and Parajuli, 2015). It measures the share of city economic change due to industry mix and reflects the degree to which the city specializes in sectors or industries that are fast or slow-growing nationally (Dinc, 2015).

The regional shift (RS) component assesses the differential shift that happen due to differences in the rates of growth of the same industry between the city and the nation. This happens due to unique factors related to the city such as natural resources, other comparative advantages or disadvantages, leadership, and entrepreneurial ability. This RS measures the unique industry performance of a specific city. If a city shows a net upward shift, then it could be because it has a comparative or competitive advantage, local worker skills, human capital concentration, entrepreneurial abilities, or the effects of regional policy (Haynes and Parajuli, 2015).

In shift-share analysis, employment, income, output, population, or a variety of other economic factors can be used to decompose. Hence, the method serves as one of the most relevant techniques for regional analysis based on regional and sectoral decomposition. It is very practical in assessing the impacts of industrial restructuring on regional and local economies and for providing guidance for industrial targeting. Thus, it is believed give much to the understanding and choice of key leading industries in the region which can help in forming local industry partnerships. By interpreting the results of shift-share analysis, it is possible to know the specific advantages of the local area or a city or region over the benchmark region and to find growth or potential growth industries worthy of further investigation and follow-up (Dinc, 2015).

In this respect, scholars have used shift-share to analyze various sectors of the economy in different spatial and economic contexts (for example, Paul, 2012; Engida and Solomon, 2014; Otsuka, 2016; Jonkeren et al., 2019). Shift-share analysis is a widely used technique for regional analysis for its uncomplicated logic, analytic simplicity, and relatively easily obtainable data requirements. Hence, since its introduction in 1960, scholars adopt and apply it to assess a variety of regional or local issues (Dinc, 2015). It is a commonly used decomposition technique in the regional economic change literature. It assumes that

smaller regions are parts of larger ones and these follow the trends of the growth indices, such as employment, population, and industrial sectors experienced by the larger regions where they are part of (Haynes &Parajuli, 2015). It helps identify the engines of growth in the community, city, or region. It is, thus, a useful technique to surmount the challenge of separating the role of local employment on the reference area employment or benchmark region.

Despite its widespread and continued use, shift-share analysis has also clear weaknesses. Like any other technique in economic base analysis, it does not answer why nor does it identify the real reasons for the growth or decline in specific contexts. Identifying the context-specific factors may need further empirical investigations into the local industrial, employment policy-related conditions. Shift-share analysis helps us to have indicative information about what happened and where it happened. This means identifying the industries that are gaining and losing employment in selected regions or cities. It helps to recognize the strengths and weaknesses of local economies compared to the reference area or a benchmark region. As discussed above, it does not answer why a city economy has a comparative (dis)advantage over the reference region and what to do to increase the local competitiveness and make a city more attractive for investors to choose it as their preferred business location.

One of the major criticisms of shift-share analysis is that it is a simple and descriptive technique. It has also been criticized for its temporal, spatial, industrial aggregation, theoretical content and predictive capabilities. One apparent weakness is that it does not take the changes in the industry mix at a national level in to account. Thus, the results are sensitive to industrial and regional aggregation. The technique also does not give information on the ways through which a region could keep up the growth of industries. Despite the drawbacks, scholars use these techniques to evaluate the performance of different sectors or industries. As shift-share combines both spatial and structural dimensions into the analysis, it remains one of the suitable techniques for local, urban, and regional economic analysis. Though it was first developed in the 1940s and popularized in the 1960s, scholars used it in local, urban, and regional analysis and applied it to various sectors (Ping &Hui, 2012; Kemeny and Storper, 2014; Dinc, 2015).

Engida and Solomon (2014) have analyzed the urban functional structure in major urban centers of Ethiopia for the period 2009-2012. This study classified cities into three different categories: towns of leading regions and urban regions; towns of provincial towns; and emerging regions. The study found distributive, social, and extractive activities as the drivers of the urban economy while the relative position of transformative sectors such as manufacturing was not promising. The major weakness of this study was that it used a three years' time range to investigate the urban functional structure in Ethiopia.

Otsuka (2016) used a dynamic shift-share analysis to analyze the energy demand and its determinants in cities of Japan. According to this study, the compositional and regional effects explain the fluctuations in energy demand in the cities of Japan. The author suggests that it is vital to diversify the industrial structure in each region to moderate the change of regional energy demand in each region. Sridhar (2017) provides a shift-share analysis of the economic change and specialization of cities in India. Niyimbanira (2018) used the method to investigate the comparative advantage and competitiveness of main industries in the North-Eastern region of South Africa. The findings of this study revealed the decline in comparative advantage in different industries in the study areas. But, regional competitiveness appeared to have the largest positive in a few industries in four cities.

Jonkren,et al. (2019) used shift-share to assess the role of modal shift to decarbonization of inland freight transport. Based on the findings, the authors suggest that the method can give policymakers up-to-date and relevant information on about the changes in CO2 emissions of a freight transport modal shift. They emphasize the strengths of the tool as it could be used in different spatial scales-cities, countries, and regions. Thus, recent developments in local, urban, and regional studies have heightened and renewed interest in investigating various sectors and/or issues at different spatial scales using shift-share analysis.

4. Materials and Methods

4.1. Data Sources

The article bases its analysis on the 2014 and 2018 Urban Employment and Unemployment Survey of the Central Statistical Agency (CSA) of Ethiopia using employment change as a unit of analysis. The Survey reports are available online for users. But, for this study statistical data were obtained from Central Statistical Agency by the author. So, the author used employment as a variable of interest in the analysis. This is because economic impact studies, in most instances, assess the urban and/or regional economic change using selected variables, one of which is employment. The CSA (2014; 2018) data provide urban employment in major industries in major urban centers covered by the surveys. In most cases, five years or ten years range is recommended for performing a shift-share analysis (Dinc, 2015). Thus, a five-year interval, 2014-2018 is used in this study for data compatibility.

The author chose the base year, 2014 (t), and the end year, 2018 (t+n), since the period 2014-2018 represents major political unrest in Ethiopia, widespread conflicts, and internal displacements (UNOCHA, 2018). This, however; does not mean that the unrest ended in 2018. The author selected six secondary cities, namely Mekele, Gondar, Bahirdar, Adama, Hawassa, and Dire Dawa for this study. Having a total labor force above 100,000 for both base and end years was the criteria of selection (See Table 1).

Table 1: Total employed labor force in six secondary cities in Ethiopia (2014-2018).

Secondary city	Total employed labor force in 2014	Total employed labor force in 2018	Absolute Change	Percentage Change
Mekelle	110,332	157,437	46,105	41.8
Gondar	126,017	132,020	15,149	13.0
Bahirdar	125,342	147,668	21,326	16.9
Adama	122,017	133,593	7,747	6.2
Hawassa	116,871	144,607	22,590	18.5
Dire Dawa	106,383	107,571	1,188	1.1

Source: Own computation based on CSA (2014 and 2018)

The author analyzed employment in primary industries (agriculture and allied activities, mining and quarrying), secondary industries (manufacturing, construction, electricity, water, and sewerage), tertiary industries (trade, accommodation, transport and storage, finance, real estate), and quaternary activities (public administration, professional services, administrative services, arts, education, health, and information communication technology (ICT)).

4.2. Analytical Techniques

The analysis was performed following a series of steps. This section, therefore, briefly presents the classical shift-share analysis procedure. Before computing shift-share components, it is necessary to compute the growth rate of the benchmark region/nation and secondary city. In this study, the benchmark region is the nation or the sum of employment of all urban centers covered in the survey mentioned above. The three individual growth rates were required to go ahead with the shift-share analysis. Thus, the national, regional, and sectoral growth rates were computed following Dinc (2015).

Firstly, the overall growth rate ($G^{\wedge(t\rightarrow t+n)}$) for employment in the benchmark region was computed using the formula below.

$$G^{t\rightarrow t+n} = \frac{E^{t+n} - E^{t}}{E^{t}} \qquad (1)$$

Second, the growth rate ($Gi^{t\rightarrow t+n}$) for employment in the benchmark region by industry i is given as follows.

$$G_i^{t\rightarrow t+n} = \frac{E_i^{t+n} - E_i^{t}}{E_i^{t}} \qquad (2)$$

Third, the growth rate ($e_i^{t\rightarrow t+n}$) for employment in the study city by industry i is given by the following formula

$$e_i^{t\rightarrow t+n} = \frac{e_i^{t+n} - e_i^{t}}{e_i^{t}} \qquad (3)$$

Where,

e_i^{t}- refers to city-specific employment in industry *i* in year *t*

$e_i^{t\rightarrow t+n}$-refers to city-specific employment in industry i in year t+n

E_i^{t}- national urban employment for major urban centers in industry i in year t

E_i^{t+n} - national employment for major urban centers in industry *i* in year *t+n*

E^{t}-aggregated national employment for major urban centers in time *t*

E^{t+n}-aggregated national employment for major urban centres in year *t+n*

Using the above growth rates, shift-share components for respective cities and industries were computed as follows. First, the national growth effects were computed using the following formula.

$$NG_i = e_i^t \times G^{t \to t+n} \quad (4)$$

Second, the industry mix effects were computed using the following formula.

$$IM_i = e_i^t \times \left(G_i^{t \to t+n} - G^{t \to t+n}\right) \quad (5)$$

Third, the regional competitiveness effects were computed using the formula given as follows.

$$RS_i = e_i^t \times \left(g_i^{t \to t+n} - G_i^{t \to t+n}\right) \quad (06)$$

The total shift in the economy or employment is the total of the above three, i.e. the national growth effect, the industry mix effect and the regional competitive effect.

$$TS = e_i^t \times G^{t \to t+n} + e_i^t \times \left(G_i^{t \to t+n} - G^{t \to t+n}\right) + e_i^t \times \left(g_i^{t \to t+n} - G_i^{t \to t+n}\right) \quad (07)$$

It could be computed as follows, TS=NG_i+IM_i+RS_i
Where,

NG_i - the national growth effect of respective industries in selected study cities

IM_i- industry mix effect in respective industries in selected study cities

RS_i- city competitive effect in respective industries in selected study cities

TS-Total shift in employment in respective industries in selected study cities.

The analysis of the data was done following the above techniques and steps using Microsoft Excel. The study presents statistical results in tables and bar charts. Based on the analysis, it is possible to categorize industries into four groups. The following section briefly presents the results and discussion.

5. Analysis of Results and Discussion

5.1. Urban Employment Change in Major Industries in Ethiopia

Urban employment change is positive or negative. It is positive when there is growth in a sector; otherwise, it is negative. The urban employment change is computed by subtracting base year employment from end year employment and dividing by base year employment and multiplying by 100. Table 2 presents the urban employment change in terms of absolute and percentage changes for the period of 2014-2018. The total national urban employment changes showed that agriculture and allied activities, mining and quarrying, construction, arts, recreation and entertainment, household-based activities revealed different levels of change. Activities of extraterritorial organizations, electricity, gas and air conditioner supply, real estate, water supply, sewerage, and waste management, and remediation showed above-average employment growth. Sectors, such as administration and support services, professional, scientific, and technical services, transport and storage, financial and insurance services, public administration and defense have shown moderate growth. Manufacturing employment showed very low growth while mining and quarrying drastically declined over the study period.

Table 2: Aggregate Employment Change in Major industries in Ethiopia

Major Industrial Categories	**Employment 2014 E_i^t**	**Employment 2018 $e_i^{t \to t+n}$**	**Absolute Change**	**(%) Change**
Agriculture, and allied activities	83,825	76,206	-7,619	-9.99
Mining and Quarrying	19,054	10,365	-8,689	-83.83
Manufacturing	340,136	357,098	16,962	4.75
Electricity, and gas	4,945	14,758	9,813	66.49
Water supply, sewerage& waste	21,793	44,427	22,634	50.94
Construction	262,593	235,002	-27,591	-11.74
Wholesale, Retail Trade; repairs	440,964	566,384	125,420	22.14
Transport and storage	142,628	218,200	75,572	34.63
Accommodation & food service	133,213	181,875	48,662	26.76
ICT	34,929	45,145	10,216	22.63
Financial & insurance activities	67,887	99,507	31,620	31.78
Real Estate activities	1,351	3,187	1,836	57.61
Professional scientific & technical	41,133	75,678	34,545	45.65
Administrative & support service	41,516	81,834	40,318	49.27
Public administration & defense	94,004	134,488	40,484	30.1
Education	143,887	173,665	29,778	17.15
Human Health & Social Work	81,226	109,003	27,777	25.49
Arts entertainment & recreation	24,058	22,037	-2,021	-9.17
Other service activities	158,122	164,342	6,220	3.79
Households as employers	267,322	230,502	-36,820	-15.94
Extra-territorial organizations	10,186	40,088	29,902	74.59
Total	2,414,722	2,883,791	469,069	16.27

Source: Own computation based on CSA (2014 and 2018)

It appears from Table 2 that the growth of transformative sectors is not promising and seems affected by the crisis over the study period. The growth rate provided in Table 2 presents the information necessary to go ahead with shift-share decomposition analysis. The absolute changes were calculated by subtracting employment end-year from employment in the base year. It showed that the total employment change in major urban centers grew by 16.27% from 2014 to 2018. The following section briefly provides the national growth effect of industries in selected secondary cities of Ethiopia.

5.2. Shift Share Decomposition Analysis

5.2.1. National Growth Effects in Six Secondary Cities of Ethiopia

The national growth component implies that the regional industrial employment grows due to the national growth. Table 3 presents the results of the national growth effect for the period of 2014 to 2018. There are different levels of national growth effects observed in different industries in selected secondary cities over the period.

Table 3: Percentage distribution of National Growth Effects in Selected Cities of Ethiopia

Major Industrial Divisions	Mekele	Gondar	Bahirdar	Adama	Hawassa	Dire Dawa
Agriculture and allied activities	2.2	19.2	9.7	3.2	1.7	3.6
Mining and Quarrying	1.4	1.4	0.5	0.4	0.1	0.5
Manufacturing	17.1	9.6	9.1	17.5	10.8	3.6
Electricity, and gas	0.0	0.1	0.2	0.3	0.3	0.2
Water supply, sewerage& waste	1.9	0.6	1.2	0.6	1.5	0.6
Construction	10.7	8.3	11.8	11.7	10.9	1.5
Wholesale; Retail Trade; repairs	19.4	15.8	15.4	19.6	20.5	31.0
Transport and storage	7.8	4.4	4.3	9.7	3.5	8.2
Accommodation & food service	4.3	3.9	10.9	8.0	7.6	4.8
ICT	0.8	0.6	2.3	1.4	1.8	1.3
Financial and insurance activities	2.3	1.7	1.9	2.2	2.0	1.5
Real Estate activities	0.0	0.0	0.1	0.1	0.4	0.0
Professional scientific & technical	1.5	1.6	2.4	0.8	2.2	1.3
Administrative & support service	2.1	1.0	1.2	1.0	2.2	1.1
Public administration & defense	5.6	1.2	3.6	1.4	5.1	5.3
Education	5.5	4.7	8.5	5.4	9.6	5.7
Human Health & Social Work	2.6	1.8	2.4	2.8	6.4	4.5
Arts entertainment & recreation	1.2	0.4	1.6	1.0	0.8	1.0
Other service activities	5.0	9.2	4.1	7.4	4.0	8.7
Households as employers	8.4	14.5	8.7	4.9	7.9	14.8
Extra-territorial organizations	0.2	0.0	0.1	0.6	0.7	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Own computation based on CSA (2014; 2018)

Table 3 presents the extent to which each industry grew or declined over the study period because of an observable positive or negative growth trend nationally. Overall employment grew by 16.27% nationally from 2014 to 2018. Thus, it is possible to expect a positive spillover on employment change by industry in study cities. The result showed positive national growth effects. However, the levels of the effects vary from city to city and industry to industry within a city. The national growth effect was higher in wholesale and retail trade in all cities; four cities except Dire Dawa enjoyed the national growth effect in Construction. The manufacturing sector experienced modest growth mainly in four cities. The study revealed very low national growth effects in real estate, utilities, mining and quarrying, ICT, and arts in the study cities just to mention a few.

5.2.2. Compositional Effects in six Secondary cities of Ethiopia

The compositional effect refers to the structural or proportional effect at a national level. Some industries grow or decline in the city for favorable or unfavorable compositional effects at the national level. Table 4 provides the structural effect on major industrial employment in selected secondary cities of Ethiopia.

Table 4: Percentage distribution of Compositional Effects in Selected Cities of Ethiopia

Major Industrial Divisions	Mekele	Gondar	Bahir Dar	Adama	Hawassa	Dire Dawa
Agriculture, and allied activities	-54.1	31.8	22.7	8.6	6.0	11.7
Mining and Quarrying	-80.7	4.2	2.1	1.9	0.6	3.0
Manufacturing	-211.5	11.2	15.1	33.8	26.7	8.1
Electricity and gas	0.0	-0.5	-1.2	-3.0	-3.2	-2.3
Water supply, sewerage &waste	135.5	-1.4	-3.9	-2.2	-6.9	-2.7
Construction	-274.0	14.2	28.5	33.0	39.3	4.8
Wholesale, Retail Trade; repairs	150.2	5.7	7.8	11.7	15.6	21.8
Transport and storage	224.7	-2.2	-3.0	-7.8	-3.6	-7.8
Accommodation and food service	62.8	0.3	1.2	1.1	1.3	0.8
ICT	7.1	0.2	1.1	0.8	1.3	0.9
Financial and insurance activities	54.0	-0.5	-0.7	-1.0	-1.1	-0.8
Real Estate activities	0.0	0.0	-0.4	-0.6	-2.6	0.0
Professional scientific and technical	*82.8*	*-2.5*	*-5.4*	*-2.1*	*-7.2*	*-3.9*
Administrative and support service	*137.6*	*-2.0*	*-3.3*	*-3.3*	*-9.2*	*-4.4*
Public administration and defense	*114.2*	*-0.2*	*-0.7*	*-0.3*	*-1.6*	*-1.5*
Education	*6.0*	*2.9*	*7.6*	*5.6*	*12.8*	*7.0*
Human Health and Social Work	*33.1*	*0.3*	*0.5*	*0.7*	*2.2*	*1.4*
arts entertainment and recreation	*-29.0*	*0.7*	*3.7*	*2.6*	*2.8*	*3.3*
Other service activities	*-66.7*	*11.2*	*7.0*	*14.7*	*10.2*	*20.6*
Activities of households as employers	*-240.4*	*26.4*	*22.5*	*14.6*	*30.2*	*52.7*
Extra-territorial organizations	*48.5*	*0.0*	*-1.1*	*-8.8*	*-13.4*	*-12.6*
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Source: Own computation based on CSA (2014; 2018)

As seen from Table 4, in most industries of selected cities, the industry mix results are negative. This means that these industries lost jobs due to structural effects at a national level. However, the industry mix effect was stronger in Mekele city than in the other five study cities. There was a more positive industry mix effect in transport and storage (224.7%), wholesale and retail trade (150.2%), administrative and support services (137.6%), water supply, sewerage, and waste management (135.5%), and public administration and defense (114.2%). There was a loss of employment in the city over the study period mainly in construction (-274%), household activities (-240.4%), and manufacturing (-211.5%). In other study cities, the compositional effect was not as pronounced as in Mekele.

5.2.3. Differential effects in six Secondary cities of Ethiopia

As discussed in the introduction, differential effect refers to the local-factor effect or the competitive effect of local industries in employment change in cities under study. It measures the extent of the changes in employment in a particular industry in a city differ from the change in the same industry nationally. Table 5 presents the differential effect in selected study cities in Ethiopia.

Table 5: Percentage distribution of differential shifts in Selected Cities of Ethiopia

Major Industrial Divisions	Mekele	Gondar	Bahir Dar	Adama	Hawassa	Dire Dawa
Agriculture, and allied activities	-1.7	48.6	48.6	-4.5	17.3	-15.2
Mining and Quarrying	-3.5	2.0	0.3	1.7	1.6	1.1
Manufacturing	9.7	20.7	108.4	38.2	77.7	66.2
Electricity, and gas	0.0	1.2	-3.3	2.7	4.1	1.7
Water supply, sewerage & waste	-12.9	-4.0	-13.4	2.5	3.9	19.6
Construction	15.3	20.2	32.1	-10.6	-1.9	67.3
Wholesale and Retail Trade; repairs	-15.9	-7.7	12.5	20.5	-39.3	-49.5
Transport and storage	-23.4	2.9	21.6	-8.9	16.8	22.1
Accommodation and food service	61.6	7.5	-60.5	4.9	7.4	24.2
ICT	3.0	1.7	-27.4	8.1	-6.2	-1.2
Financial and insurance activities	-1.5	-1.4	-2.5	3.8	14.6	10.4
Real Estate activities	0.0	0.0	-2.5	0.3	-9.4	0.0
Professional scientific and technical	-1.7	-4.9	-28.4	9.3	10.9	-3.9
Administrative and support service	13.9	0.0	-5.4	1.1	-22.3	-8.6
Public administration and defense	-24.3	12.5	12.9	4.2	-48.9	-1.3
Education	23.5	11.6	-23.0	17.4	37.6	3.9

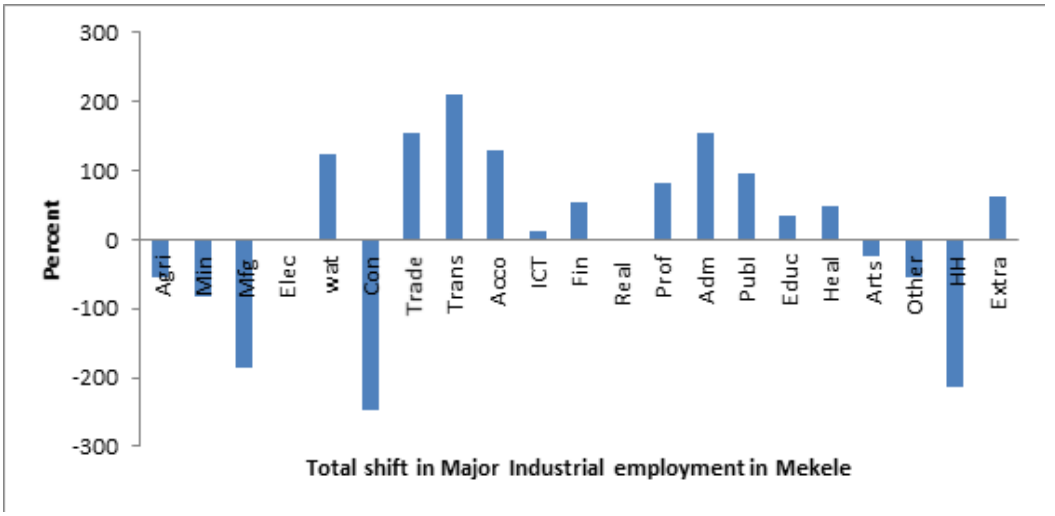
Human Health and Social Work	13.3	5.0	1.7	15.6	-24.2	7.9
arts entertainment and recreation	4.6	1.8	-4.9	-1.8	6.3	-3.8
Other service activities	7.1	-9.3	19.7	4.8	17.2	-14.8
Households as employers	19.0	-8.5	3.0	2.0	39.6	-14.8
Extra-territorial organizations	14.0	0.0	10.5	-11.1	-2.8	-11.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

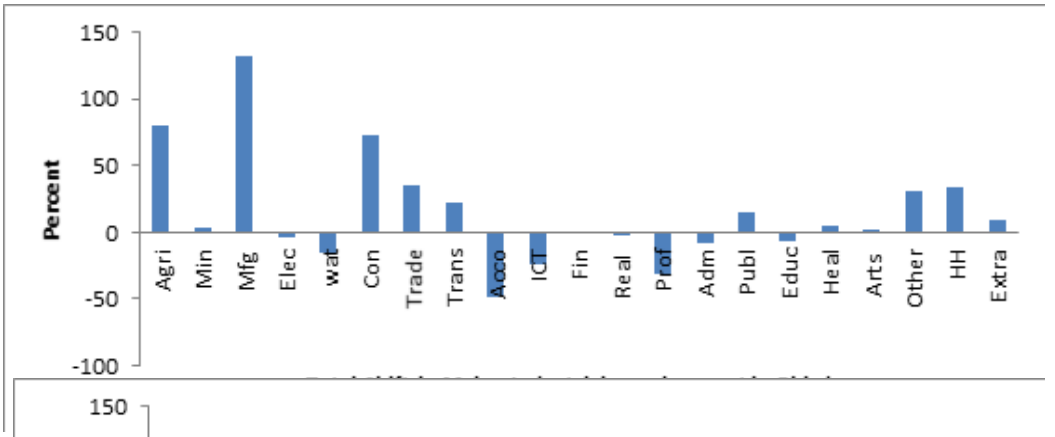
Source: Own computation based on CSA (2014; 2018)

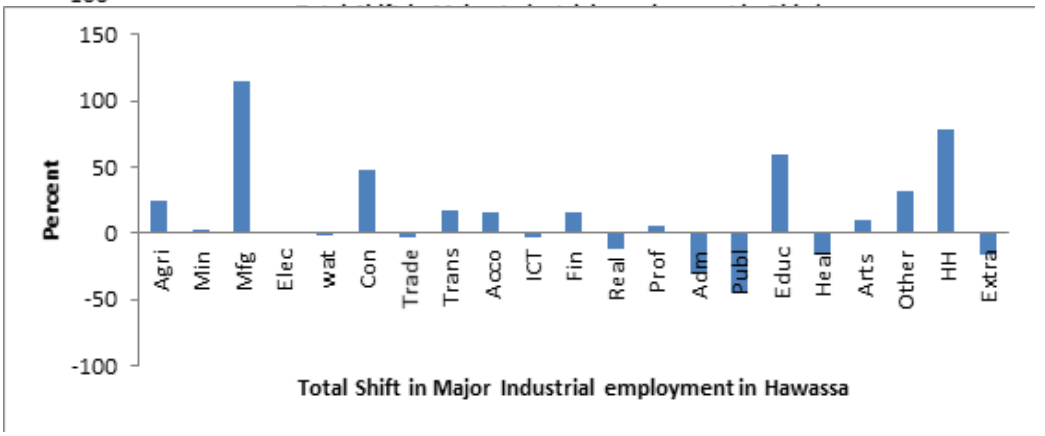
As seen from Table 5, all study cities showed different levels of differential effects in employment changes in various industrial sectors. Even though all cities have competitive share effects in some industries, Bahirdar, Hawassa, and Dire Dawa were strong competitor in manufacturing with the largest employment growth over the study period by 108.4%, 77.7%, and 66.2% respectively. Mekele was a strong competitor in accommodation and food services with 61.6% employment growth while Bahirdar had a weak position with 60.5% employment loss in the same industry. Besides impressive growth in the manufacturing sector, Dire Dawa was a strong competitor in construction (66.2%); while it had a weak position in wholesale and retail trade (-49.5%). Gondar and Bahirdar had a modest competitive position in agriculture and allied activities with employment growth of 48.6% each over the study period. In Hawassa, while public administration and wholesale and retail trade suffered from employment loss because of a weak competitive position, household activities and education had a modest competitive position. Adama witnessed modest employment growth over the study period in manufacturing (38.2%); Bahirdar had modest growth in the construction (32.1%). In other sectors not mentioned above, there have been modest or low, negative or positive competitive effects.

5.2.4. Total Employment shift in six secondary Cities of Ethiopia

As discussed in the review and method sections, total employment shift is the sum of the national growth, industry mix, and competitive share effects. In this section, the total employment shifts in selected secondary cities of Ethiopia over the period of 2014-2018 are presented. This section presents the total employment shift for two groups of cities. The first group includes Mekele, Bahirdar, and Hawassa, which are the administrative headquarters of Tigray, Amhara, and Southern National Regional States, respectively. The second group includes Adama, Dire Dawa, and Gondar. These are not regional headquarters but have different functions. For example, Gondar is a historic city, a major tourist destination; Dire Dawa is an urban region; Adama which is at 99 kilometers to the east of Addis Ababa has been acting as a transport hub for the region. Figure 1 shows the total employment shift for Mekele, Bahirdar, and Hawassa over the study period.







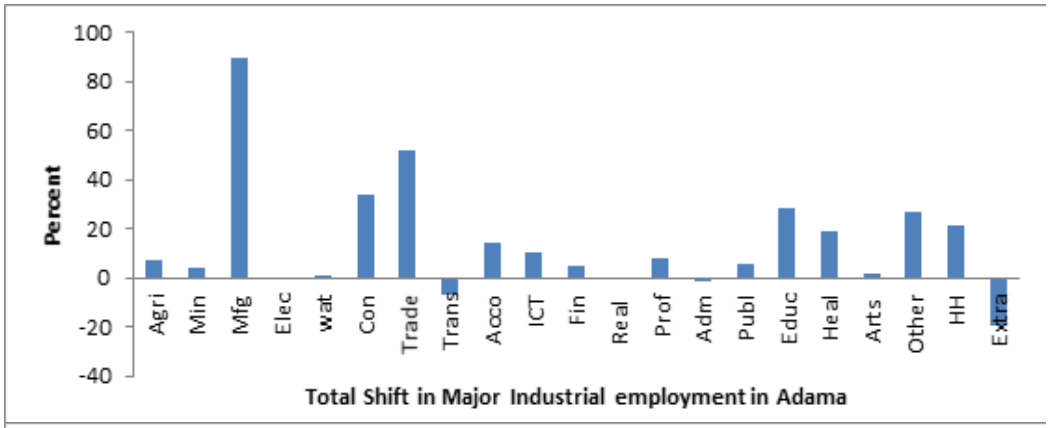
Source: Own computation based CSA (2014; 2018)

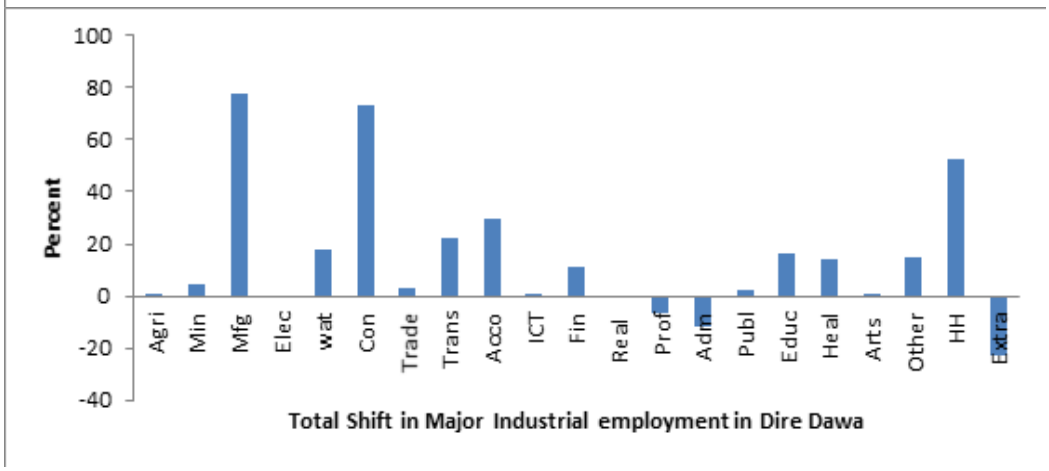
Figure 1: Total employment change in Mekele, Bahirdar and Hawassa (2014-2018)

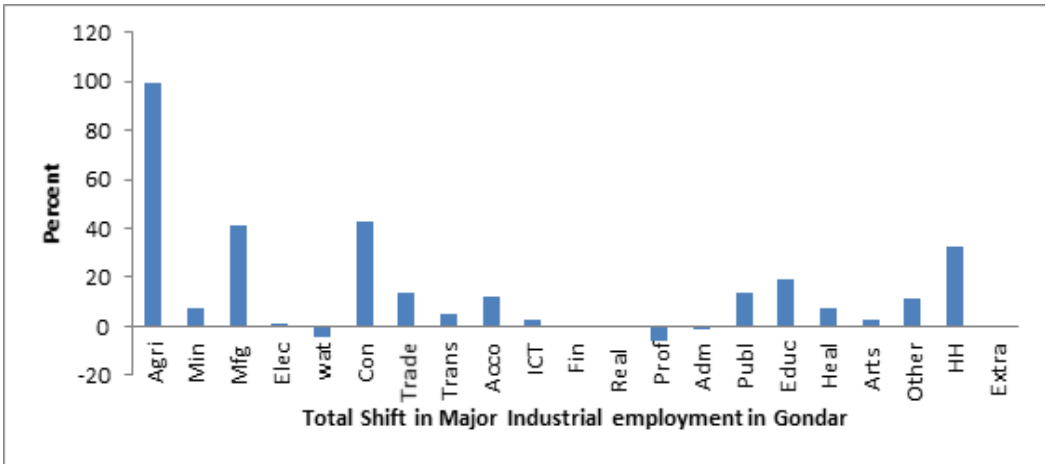
As Figure 1 shows, in Mekele, a significant positive total employment shift happened in transport and storage, wholesale and retail trade, administrative and support services, water supply, sewerage and waste management, accommodation and food services, public administration and defense, and professional, scientific and technical services. Construction, household activities, manufacturing, mining, and quarrying underwent significant decline in total employment shift over the study period in Mekele.

In Bahir dar, the manufacturing sector experienced stronger positive growth, followed by agriculture and allied activities. Sectors such as wholesale and retail trade, household activities, other service activities, transport, and storage showed a small positive change. Accommodation and food services, professional, scientific, and technical services, and ICT suffered employment decline over the study period. There are other sectors that saw a sign of decline over the same period.

In Hawassa, the manufacturing sector saw a significant positive employment shift in the city over the study period. In addition, household activities, education, and construction also experienced moderate total growth. Public administration and defense, administrative and support services, real estate activities, human health and social security, and activities of extraterritorial organizations experienced employment decline over the study period in the city.







Source: Own computation based CSA (2014; 2018)
Figure 2: Total employment change in Adama, Dire Dawa and Gondar (2014-2018)

As seen from Figure 2, in Gondar, agriculture and allied activities showed a more positive shift, followed by construction, manufacturing, and household activities. Overall, except water supply, professional, scientific and technical services, and administrative and support services, all the rest experienced a modest positive change but not as big as the agriculture and allied activities.

In Adama city, manufacturing grew considerably over the study period. A moderate positive change has occurred in wholesale and retail trade, education, other social service activities, household activities, and human health and social security. A very low positive growth has occurred in accommodation and food services, ICT, professional, scientific, and technical activities, agriculture and allied activities, mining and quarrying, and others. Activities of extraterritorial organizations and transport and storage declined over the study period.

Dire Dawa city, like Bahirdar, Adama, and Hawassa, experienced a strong total employment shift in manufacturing, followed by wholesale and retail trade and construction. Education, other service activities, and household activities showed a moderate positive shift. The activities of extraterritorial organizations and transport and storage experienced an insignificant decline over the study period in the city.

6. Discussion

The purpose of this study was to identify the factors that cause changes in employment in six secondary cities of Ethiopia based on shift-share decomposition. The study sheds light on the employment dynamics over the period of 2014 to 2018 in these cities. Based on the analysis, following Haynes and Parajuli (2015), it is possible to identify and classify industries into four categories for monitoring the changes and taking necessary actions. The first groups of industries include those show positive employment growth because of compositional and local competitiveness effects. These groups of industries are more likely to grow. The second groups of industries are those with growth in employment for compositional effects but job loss because of their weak local competitiveness effects. The third groups of industries include those with growth in their employment because of

local competitiveness effect but with job losses because of compositional effects. The last groups of industries are those experience job losses due to compositional and competitive share effects. Based on the above characteristics of industries, for cities having some weaknesses in some industries, it is possible to suggest appropriate measures.

The results point out that Mekele city, headquarters of Tigray National Regional State, had a structural and competitive advantage in accommodation and food services, administrative and support services, education, human health, and social security, and information communication technology. As these industries are gaining employment on both grounds, are likely to grow. Nationally growing but locally declining sectors in Mekele include manufacturing, construction activities of the household as employers, other service activities, art, entertainment, and recreation. This finding contradicts Engida and Solomon (2014) and Temam and Rao (2017) but concurs with Negese et al., (2017) pinpointing the dynamism of these sectors over time. Nationally declining but locally growing sectors include water supply, sewerage, and waste management, transport and storage, wholesale and retail trade, financial and insurance activities, public administration and defense, professional, scientific and technical activities. The last groups of industries lose employment because of their weak industry mix and competitive share effects include agriculture and allied activities, mining and quarrying.

The shift-share results for Gondar, a historic city in Amhara National Regional State, show that the city has a better position in agriculture and allied activities, manufacturing, construction, mining and quarrying, human health and social security, accommodation and food services, arts, entertainment and recreation, ICT and education which were growing over the study period because of their positive industry mix and competitive share effects. Consequently, these industries are likely to grow in Gondar. As agriculture and allied activities continue to grow, this finding is consistent with Engida and Solomon (2014) and Temam and Rao (2017) in which the city had an agrarian and a mining functions. The sectors that are performing poor nationally but gaining employment in Gondar includes public administration and defense, transport and storage, electricity, gas steam and air conditioner. The industries that are strong nationally but weak locally include wholesale and retail trade, other service activities, and activities of households as employers. Water, sewerage and waste management, financial and insurance activities, and professional, scientific and technical activities were losing employment on weak industry mix and competitive share effects.

The results show that Bahirdar city, headquarters of the Amhara National Regional State, had a structural and competitive advantage in manufacturing, agriculture, and allied activities, construction, wholesale and retail trade, other service activities, human health and social security, activities of households as employers and mining and quarrying which are gaining employment because of their positive industry mix and competitive share effects. In these industries, employment growth is expected. The finding for Bahirdar is in part in line with and partly contradicts Temam and Rao (2017). In the city, public administration and defense, transport and storage activities of extraterritorial organizations are locally competitive but nationally weak. Accommodation and food services, ICT, education and arts, entertainment, and recreation are strong nationally but weak in Bahirdar as shown by their industry mix and competitive share effects. Professional, scientific and technical services, water, sewerage and waste management, administrative and support services, real estate activities, financial and insurance activities, and electricity, gas steam, and air conditioners are losing employment on both grounds. These sectors are likely to decline.

The analysis shows that Adama city, a former transport, storage and communication center East of Addis Ababa, had a structural and competitive advantage in manufactur-

ing, mining and quarrying, wholesale and retail trade, accommodation and food services, ICT, education, human health and social security, other activities, and activities of the household as employers which gained employment because of their strong position in industry mix and competitive share effects and are likely to continue to grow. Agriculture, construction, and arts entertainment and recreation activities were strong nationally but performing poorly in Adama. The locally competitive and nationally weak sectors in the city include water, gas steam, and air conditioner, financial and insurance activities, real estate activities, professional, scientific, and technical activities, administrative and support activities, and public administration and defense. Poorly performing sectors on both grounds include transport and storage and activities of extraterritorial organizations. Adama's position as the center of transport, storage, and communication has declined as shown in this study. Thus, the finding in this study contradicts Solomon (2008); Engida and Solomon (2014); and Temam and Rao (2017). It should be noted that as time goes by, engines of growth of the city change.

The results show that Hawassa city, headquarters of the Southern Nations, Nationalities and Peoples Regional State (SNNPRS), had a structural and competitive advantage in manufacturing, agriculture and allied activities, mining and quarrying, accommodation and food services, education, other service activities and activities of households as employers which were strong on both grounds over the study period and likely to continue to gain employment. Wholesale and retail trade, human health and social security, ICT, and construction were good performers nationally but weak in Hawassa. Transport and storage, financial and insurance activities, professional, scientific and technical activities, water, sewerage, and waste management, electricity, gas steam, and air conditioner were weak nationally but competitive in Hawassa. Public administration and defense, administrative and support services, real estate activities, activities of extraterritorial organizations were weak and hence losing employment due to their industry mix and competitive share effects. The study is somehow not in line with Engida and Solomon (2014) but partly in agreement with Temam and Rao (2017) indicating the dynamics of the sectors over time.

The shift-share analysis reveals that Dire Dawa City, a city in Eastern Ethiopia had a structural and competitive advantage in manufacturing, construction, accommodation, education, human health and social security, and mining and quarrying activities which were strong on both grounds and likely to grow. Wholesale and retail trade, agriculture and allied activities, other service activities, activities of households as employers, arts, entertainment and recreation, and ICT were strong nationally but weak in Dire Dawa. Transport and storage, water, sewerage and waste management, financial and insurance activities, electricity, gas steam, and air conditioner are competitive in Dire Dawa while weak nationally. Activities of extraterritorial organizations, administrative and support services, professional, scientific, and technical services, public administration, and defense declined because of their weak industry mix and competitive share effects. The case for Dire Dawa partly goes in line with Solomon (2008); Engida and Solomon (2014); and Temam and Rao (2017).

7. Conclusion and Implications

Secondary cities play vital roles in the national economic growth and development. Therefore, analysis of urban economic change is essential as it helps inform the decision-makers and urban authorities with relevant and up-to-date empirical assessments of industrial health of cities. This study, therefore, sheds light on the urban employment dynamics in six selected secondary cities of Ethiopia using shift-share decomposition. It identified

the industries that perform well on account of gaining employment because of structural and local factors; based on structural determinants only; based on local factors only, or performing poorly and losing jobs based on structural and competitive effects. The national growth has positively affected the employment change in selected cities and their respective industries.

Based on the findings, the author suggests the following measures to improve the employment dynamics in various industries which performed poorly in the study cities. For cities with industries growing over the study period for structural and local competitiveness effects, it is essential to maintain the growth trend. But, for industries losing employment on account of structural or differential effects or both, there is a need for monitoring and taking appropriate actions.

First, it is essential to improve the local productive and social infrastructure to attract investors in various sectors in these cities. Specific infrastructure and services may vary from city to city. It is, therefore, suggested that the Urban Development Departments should identify its weaknesses in the level and quality of infrastructure and services that may have deterrence effects on industries that appeared to have been poorly performing in the city. Second, it is vital to develop growth industries in each city. Identifying and targeting growth industries can promote positive employment change. For instance, in Mekele, manufacturing and other secondary economic activities were not promising. Therefore, city administrators and municipal authorities in each city should give attention to the local-specific factors that caused poor performance or employment decline in the sectors and take actions to make the manufacturing and other secondary sectors engines of growth of the city. The third recommendation is to take measures to ensure peace and the security in these cities. In the study period (2014-2018), there have been massive destructions of infrastructure and industries in different cities of the country. Ensuring peace and security is not the responsibility of city officials alone; it needs concerted efforts of stakeholders at local, regional, and national levels from private, public, and humanitarian sectors.

8. Limitations and Future Research

This study used secondary data from Employment and Unemployment Survey of the Central Statistical Agency of Ethiopia for the shift-share decomposition. It used macro-level data to evaluate the employment dynamics in six secondary cities in Ethiopia between 2014 and 2018. Therefore, city-specific, detailed investigation of the weaknesses and strengths are the missing element in this study. Thus, the author suggests city-specific empirical investigations to understand the factors that determine employment dynamics in these cities. To this end, it is possible to conduct such studies using a mixed-methods approach.

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