Competitive Social Sciences Research Journal (CSSRJ), 3(2), 434-452
ISSN (Print):2708-9029,ISSN(Online):2708-9037
www.cssrjournal.com

Economic Structure of Major Cities of Pakistan, A Regional Specialization and Concentration Analysis

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ABSTRACT

Cities economic structure plays a vital role in the process of city's growth. National economy mostly reflects the performance of its cities and pattern of growth of these cities largely shape the national growth path. The objective of this study is to contribute to the existing research by providing new pragmatic results about regional specialization and spatial concentration pattern and identifying economic base of fourteen major cities, Karachi, Lahore, Islamabad, Faisalabad, Rawalpindi, Multan, Gujranwala, Sargodha, Sialkot, Bahawalpur, Hyderabad, Sukkur, Peshawar, and Quetta of Pakistan. The analysis is based on the labour force survey (LFS) data for the years 2005-06, 2009-10 and 2012-13 collected from Pakistan Bureau of Statistics. Herfindahl index for regional specialization and geographical concentration are calculated using industrial employment both by industry and by region. It is found that regions specializing in Textile, Wearing Apparel and Leather tend to have comparatively greater value of this index. The results of Herfindahl index for spatial concentration by region revealed that among the cities considered here Karachi has the highest value as it is the only port city in Pakistan. Industries are increasingly clustered in Lahore on account of having a well-equipped infrastructure. Spatial concentration using industry as a numeraire indicated that in Pakistan basic metal industries tends to concentrate spatially while that of textile industry and food, beverages & tobacco industry are getting dispersed by location. From Location quotient analysis it is observed Karachi has a comparative advantage in basic metals industry, Sukkur in food, beverages and tobacco industry, Hyderabad in handicraft & other manufacturing industries, Lahore in paper and paper products industry, Faisalabad in textile and wearing appraisal industry, Islamabad and Peshawar in chemical & chemical, petroleum, coal, rubber and plastic products, Gujranwala in basic and fabricated metal products, Quetta in wood & wood products. The economic base of all these cities are consistent from 2005-06 to 2012-13.

***Keywords*:** Agglomeration, Spatial Concentration, specialization, Urbanization.

To cite this article: Tabassum, U., Nazeer, M., Zehra, N & Abdullah, A (2022). Economic Structure of Major Cities of Pakistan, A Regional Specialization and Concentration Analysis. Competitive Social Science Research Journal (CSSRJ), 3(2), 434-452

INTRODUCTION

Cities economic structure not only plays a vital role in the process of city's growth but also take part in the growth process of nation. As mention by Jane Jacobs (1984), in her classic study "Cities and Wealth of Nations", that city is the key economic entity rather than a nation. Cities are the country's main trading nodes that exchange goods and services knowledge and people with other domestic and international cities. In a same way Krugman (1994) argue that a good way to understand the national economy is by studying the economy of its cities because the national economy mostly reflect the performance of its cities and pattern of growth of these cities largely shape the national growth path.

There exist mainly two types of cities, diversified and the specialized. The emergence of cities belonging any of the two types is dependent upon the type of agglomeration economies concentrating in that area (Rahman, 1990). Specialization is a process of effective allocation of abundant resources towards some specific task intending to minimize per unit cost. Different regions are blessed with different resource allocations and when these regions make effective use of the resources they become more competitive in relation to other regions. This process is referred to as Regional Specialization. As per the neo-classical theory of trade, the concept of comparative advantage explains the specialization patterns of a region in terms of relative production cost (Ricardo, 1817) and relative factor endowments (Heckscher, 1919 and Ohlin, 1933). The comparative advantage leading to regional specialization frames the basis of city emergence via scale economies (O Sullivan, 1993). Economies of scale can be achieved in production and exchange through factor specialization [1] and divisibility of indivisible input cost[2]. A city is specialized if it's concentrated locally in those industries which produce a similar type of output. Hence such cities achieve specialization and economies of scale in production of that particular industry. On the other side diversified city is one that, instead of producing a similar type of output, opt for the production a variety of output that is more diversified production. The inter-relation between regional specialization and spatial concentration of industries is narrowly seen in the literature of regional economics. Regional specialization displays the sector-wise sharing of economic activities by a particular region in comparison to the rest-over country. It also presents the territorial perspective of a region compared to the entire country. On the other hand geographical concentration portrays the distribution of regional shares by a particular economic activity that is share of a certain economic activity in the region as compared to the share of the same economic activity in the overall economy. Literature pointed out that specialization was rooted mainly in trade theories while that of concentration were in location theories. As per these traditional trade theories, specialization is done in the production of those products which require relatively more of the abundant input factors available in the country. While, reasons for dispersion and agglomeration are related to the location

[1] Factor specialization is a process by which worker's skill and efficiency increases with repetition and spend less time switching between tasks

[2] Indivisible input cost is the fixed cost of capital that must be bore for production which then spreads over the entire production. The more one produce the less will be the unit fixed cost.

theories which state that economies of scales, forward and backward linkages, favor concentration. On the other hand dispersion is encouraged by congestion, low costs of immobile factors and transport cost (Rossi-Hansberg, 2005 and Aiginger & Rossi-Hansberg, 2006). In short, specialized cities results out of localization economies while diversified ones borns out of urbanization economies.

The objective of this study is to contribute to the existing research by providing new pragmatic results about regional specialization and spatial concentration pattern and identifying economic base of fourteen major cities of Pakistan. This paper enlightens the regional specialization and spatial concentration pattern of industries in Karachi, Lahore, Islamabad, Faisalabad, Rawalpindi, Multan, Gujranwala, Sargodha, Sialkot, Bahawalpur, Hyderabad, Sukkur, Peshawar, and Quetta as well as the economic base of these cities.

The analysis is based on the labour force survey (LFS) data for the years 2005-06, 2009-10 and 2012-13 collected from Pakistan Bureau of Statistics. To measure concentration ratio and specialization ratio Herfindahl Index is used. The Herfindahl index of regional specialization is an absolute measure and it sums up the squares of industry shares in the total activity in the region. It could take values between zero and one. Its evolution might reveal to what extent a given region is becoming more specialized or diversified regardless of how the economic structure of the country as a whole is evolving (Beine, Coulombe, 2004 and Ceapraz, 2008). The Herfindahl index of spatial concentration is a measure of absolute concentration and is calculated as the sum of the region's share in national employment in the particular industry. To find out the economic base of each city location quotients is used. Location Quotient (LQ) is a technique of measuring concentration of particular industry, cluster, occupation, ethnic group etc. in a region as compared to the benchmark region (Gilmer et.al, 1989). In a same way Industrial Location Quotients (ILQ) is calculated by observing the industry's share of regional employment against its share of national employment.

The paper is organized in five sections: followed by section 1 discussed earlier Section 2 surveys the relevant literature that provides the review of empirical work conducted previously on this topic, while section 3 briefly describes the methodology selected for the measurement of concentration and specialization in Pakistan. Sections demonstrate the results of regional specialization, spatial concentration and economic base across time for major cities of Pakistan. Finally in section 5 conclusion and policy implication are discussed.

Review of literature

The basic notion of regional economy is that the said economy is mutually dependent unit that change over time differently than the larger economy of which it is a part. This idea is becoming increasingly salient as different region fight to increase their attractiveness in order to attract economic activities from other regions (Don Kaiser; 1992). To elucidate changing structures of employment and other economic activities particular to a local economy different economic base models have developed. Economic base analysis includes the descriptive analysis of economic data for a particular region so as to sharpen the focus of the structure of local economy and different techniques used to scrutinize a structure of local economy range from econometric forecasting of economic variables to regional input-output modeling and impact analysis (Campbell; 1989) Thus for a better understanding of scrutiny of the available literature is to be done for both theoretical and empirical literature.

Regional Specialization and Spatial Concentration

Existing theoretical literature about the pattern of specialization and location of industries or spatial concentration consists of two school of thought Traditional trade theories explicate the pattern of specialization on the basis of relative endowments of factor of production across regions while new trade theory or new economic geography model (NEG) highlight the concept of agglomeration economies and increasing return in production as the explanation for the industrial concentration in particular region .

Traditional trade theories explains the pattern of specialization in the course of difference in relative production term as comparative advantage comes from difference in productivity and endowments between regions (Ricardo, 1817; Heckscher, 1919 and Ohlin, 1933). Traditional theories are based on the assumption of perfect competition, homogenous products and constant return to scale in production. These theories foresees that trade liberalization and economic integration will increase inter-industry specialization based on comparative advantage.

New trade theories mainly explain intra industry trade (Krugman, 1979; 1980; 1995), (Krugman and Elizondo, 1995). Krugman build up a model where regions commence exchanges even if there is no comparative advantage at all these model were built by assuming increasing return to scale, product differentiation and imperfect market. Industries facing significant fixed cost or decreasing average variable cost would be benefited from lower average cost of production by producing more goods and services which consecutively enhance the competitiveness of industry and this positive response eventually leads to high concentration of production. The new trade theory model also focus on geographical advantage of a region. Increasing return to scale along with geographical advantage or disadvantage will set the pattern of specialization and location of industrial activities. These models imply that specialization may be the result of spatial agglomeration of economic activities (Krugman, 1991; Krugman & Venables, 1995).

Empirically, Geographic concentration and regional specialization of industries are seen by many researchers as to be two sides of the same coin. Regional specialization and geographic concentration of industries are defined using the same production structures as base so as to reflect the same reality which is evident from various studies in the existing literature of regional economics (Aiginger, 1999).

Since 19th and 20th century researchers were modeling regional specialization and geographical concentration rooting from trade theory and location theory respectively and conducting empirical studies on them. The literature about regional concentration probably commence with Krugman (1991). Krugman (1991) was the one which estimated Gini coefficient to capture concentration in various regions by comparing the regional market shares for a single industry with manufacturing's employment structure. Setting a traditionally localized industry (automotive industry) as a benchmark he found that large numbers of industries were localized though most of these were not cutting-edge and that industries related to high technology sectors such as textile, were highly clustered. Krugman estimated concentration of industries at a place is not solely depends on technological spillover and the results he found was biased due to limitation of data.

Aiginger and Rossi-Hansberg (2006) deliberated regional specialization and geographical concentration as the two sides of the coin and theses two could be calculated from the same matrix showing industries in rows and geographical regions in columns. For the estimation of specialization columns are to be measured while for that of concentration rows are to be considered. Aiginger and Davies (2004) using a mathematical model pointed out that if inequalities across columns varies so does it varies across rows.

Despite what we have discussed so far there exist a vast literature emphasizing implicitly or explicitly that these two phenomena, regional specialization and geographical concentration, are mutually exclusive rather than mutually in- exclusive as these two might not in all cases move in the same direction, and are probably going to take place at different speeds as suggested by Dalum, et al (1998). Moreover, as per Rossi-Hansberg (2005) empirical model provided evidence that specialization and concentration might move at an angle of 180 degree from each other when encountered with transport costs. Transport cost is inversely proportional to the degree of geographical concentration and directly proportional to degree of regional specialization (Aiginger and Rossi-Hansberg, 2006).

Most of the empirical studies carried out in this field employed indices like Herfindahl Index, Krugman Dissimilarity Index, Gini Index and others, each one having some advantages and limits (Ceapraz, 2008). Herfindahl Index is probably the most commonly used indicator of measuring spatial concentration and regional specialization, Agnes Hegyi-Keri (2013) focused on concentrations and specialization processes in the Visegrád countries (Hungary, Poland, Czech Republic and Slovakia) during the years 2000-2007. Concluding his regions' absolute concentration index values mentioned that the values of the index of specialization were higher in comparison with others for central Hungry. Though, his index for spatial concentration present somewhat different conclusion as it favoured Slovakia to be more concentrated in term of both sectoral (specifically in agriculture sector) and spatial concentration for all sectors.

Goschin, et al (2009) estimated Herfindahl Index for both concentration and specialization using Gross value added and employment data by industry and region for the years 1995 to 2007. They presented a number of conclusions, (i). Values of the specialization indices are higher when calculated on the basis of employment than on the basis of Gross value added while there values of spatial concentration indices did not vary across estimation bases significantly, (ii). Interestingly the values of spatial concentration index are smaller than that of specialization index despite of its increasing along with declining specialization trend for all Romanian region and (iii).The values of spatial concentration indices are higher for developed region as they tends to be more diversified than in less developed regions.

Regional specialization and the geographic concentration patterns of manufacturing industries as measured by dissimilarity index in Bulgaria, Estonia, Hungary, Romania and Slovenia had changed during 1990-1999 (Traistaru, et al 2002). They found that in Bulgaria and Romania regional specialization had increased with no significant changes in Estonia, Hungary and Slovenia. Further they found that large economies of scale, high technology and high wages are associated with highly concentrated industries. On the other hand industries with low technology and low wages are more likely to be dispersed spatially.

Using 1994-2000 data of Hungry, Herfindahl index calculated by Iara & Traistaru (2004) indicated that specialization in manufacturing had risen by 6.5 percent on average. It increases for interior regions and regions bordering countries outside the EU enlargement. While it decreases for regions bordering other accession countries and constant for regions bordering EU countries.

Economic Base of City

The theoretical perspective of the location quotient analysis is quite straight forward. It represents "a quick and inexpensive means of categorizing economic activity into those that are basic, systematically traded, and those that are non-basic or locally produced and consumed" (Gilmer, Keil and Mack, 1989). For researchers and policy makers the analyses of location quotient gives reference by which they can categorize goods and services that have a potential to become an economic base of particular region and they have a wide scope of exports, or the goods and services in which particular region owe comparative disadvantage so they have to import. Thus it identifies the areas of specialization in relation to the larger reference economy

The analysis of Industrial Location quotient is recognized in empirical literature as an efficient way of describing the structure of a regional economy. Gibson, Miller and Wright (1991) illustrate that Industrial location quotient capitulate a coefficient that gives an idea of how well represented a particular industry is in particular region. The mathematical calculation of the location quotient is quite simple. Isserman (1977) describes the calculation in term of demand and supply. According to him the location quotient is a difference between share of region's total production of industry (i), available to nation and the region's share of consumption or quantity demanded. If the difference is positive the region is said to be specialized and the excess production is assumed to be exported.

Galambos and Schreiber (1978) suggest few steps for the calculation of location quotient. First they calculate employment in each industry expressed as a percentage of total national employment and then to get an estimate of local employment multiply these percentage share by total employment in each local industry. These estimates are called "estimated local requirements". The greater value of these estimated local require employment over actual employment in each local industry indicates export potential of theses industries.

Gibson, Miller and Wright (1991) measure location quotient as a ratio of ratios. The numerator is the ratio of employment of industry i in region j to the total employment of region j and the denominator is the ratio the ratio of employment in industry i in reference region to the total industrial employment in reference region. In this paper the methodology proposed by Gibson, Miller and Wright (1991) is used because of availability of employment data at industrial and regional level although all techniques are mathematically equivalent.

Methodology

Measuring Regional Specialization and Spatial concentration:

As regional specialization conveys sector-wise share along with regional perspective in the overall economy, if in a region a large combined share is contributed by a small number of industries that region is classified as a highly specialized region. Herfindahl Index, Krugman Dissimilarity Index, Gini Index and others were used to measure regional specialization in various empirical studies though these all have their merits and demerits (Goschin, et al; 2009). This study employs Herfindahl index

the most commonly used index for measuring spatial concentration and regional specialization in absolute terms. Industrial concentration either through employment or production by industry is usually used to capture regional specialization using the following formula,

$$\mathbf{RS_j^s = \sum_J s_{ij}^{s^2}} \text{ ..... (1)}$$

Where

RS_j^S = Herfindahl index of specialization for region j.

S_{ij}^s =The weight of the employment in the industry i of the region j of the total employment of the region j

$$\boldsymbol{S_{ij}^s = \frac{E_{ij}}{E_j} = \frac{E_{ij}}{\sum_i E_{ij}}} \text{ ---------- (2)}$$

E_{ij} = The employment of industry i from the region j.

E_j = Total employment of region j.

The above index ranges from 0 to 1. The more a region's Herfindahl index is closer to 0 the greater it is diversified and the more it is away from 0 or closer to 1 the more it is specialized. Spatial concentration refers to concentration of a particular economic activity by space. Herfindahl index of spatial concentration is calculated as the sum of the regional shares in national employment in the particular industry both by regions and industry. Symbolically,

Spatial concentration by region: $\mathbf{SCR_j^c = \sum_i CR_{ij}^{c^2}}$ ---------- (3)

Spatial concentration by industry: $\mathbf{SCI_i^c = \sum_J CR_{ij}^{c^2}}$ ---------- **(4)**

Where:

SCR_j^c = Herfindahl index of spatialconcentration for region j.

SCI_i^C = Herfindahl index of spatial concentration for industry i.

$\boldsymbol{CR_{ij}^c}$ = The concentration ratio: The weight of employment in the industry i from the region j in the total employment of the industry.

For Region

$$\boldsymbol{CR_{ij}^c = \frac{E_{ij}}{E_i} = \frac{E_{ij}}{\sum_i E_{ij}}} \text{ ---------- (6)}$$

For Industry

$$\boldsymbol{CR_{ij}^c = \frac{E_{ij}}{E_i} = \frac{E_{ij}}{\sum_j E_{ij}}} \text{ ---------- (5)}$$

E_{ij}= Employment of industry i from the region j;

E_i=Total employment of industry i in all regions.

Range of spatial concentration index is similar to specialization index with 0 indicating no concentration and 1 for spatial concentration.

Calculating these indices for measuring regional specialization and spatial concentration in 14 major cities of Pakistan we used employment data rather than production of manufacturing industries in each city due to the ease of availability of employment data.

Measuring Economic Base of the City by location Quotient

Industrial Location Quotient (ILQ) is a method of enumerating agglomeration of an industry in a particular region compared to a larger geographic area, such as the nation (Gilmer et.al, 1989). Industrial Location Quotients (ILQ) is measured by the ratio of industry's share of regional employment to its share of national employment (Gibson, Miller and Wright; 1991). Using Formula

$$ILQ = \frac{S_{ij}}{S_{in}} \text{ ---------- (7)}$$

Where,

S_{ij} = employment share of industry i in a region (city).

S_{in} = employment share of industry i in a national employment.

$S_{ij} = \frac{e_{ij}}{e_j}$

Where

e_{ij} Represent employment of industry i in city j and

e_j Represent total industrial employment of city.

$S_{in} = \frac{E_{in}}{E_n}$,

Where

E_{in} Represent employment of industry i in nation.

E_n Represent total industrial employment in nation.

If the value of ILQ is greater than one it indicates that the particular industry is a part of economic base of that region or city j has a comparative advantage in the production of that industry. On the other side, If ILQ is less than or equal to one then the industry is not part of the economic base of that region or city.

Empirical Results

Following globalization, cities are becoming more diversified in relation of being specialized. To examine whether this is true in Pakistan we planned to estimate the measure for regional specialization mentioned above. These estimated Herfindahl index is presented in Table-1, below for 14 major cities in Pakistan for four years interval.

Table-1: Regional Specialization for Major Cities of Pakistan.

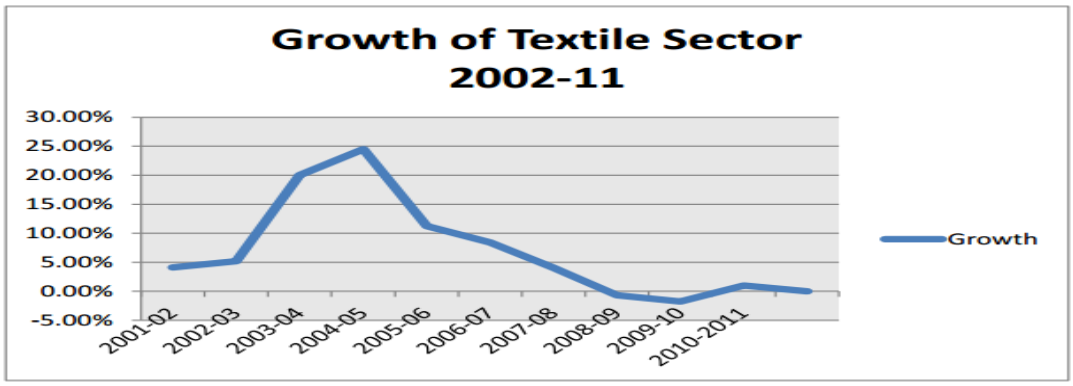
Major cities of Pakistan / Year	1999-00	2005-06	2010-11	2012-13
Lahore	0.21	0.27	0.19	0.23
Faisalabad	0.49	0.60	0.58	0.58
Rawalpindi	0.16	0.30	0.23	0.15
Multan	0.21	0.52	0.39	0.26
Gujranwala	0.31	0.31	0.26	0.22
Sargodha	0.25	0.19	0.19	0.30

Sialkot	0.32	0.35	0.32	0.45
Bahawalpur	0.18	0.32	0.32	0.37
Islamabad	-	0.25	0.25	0.21
Karachi	0.32	0.41	0.34	0.33
Hyderabad	0.24	0.25	0.22	0.21
Sukkur	-	0.25	0.23	0.20
Peshawar	0.23	0.18	0.19	0.23
Quetta	0.25	0.22	0.23	0.21

Source: Author's calculations.

Table -1 revealed that values of the index for regional specialization fluctuate slightly across time in major cities of Pakistan. Specialization index of a region is subject to the economic activity in which a region specializes in. It is found that regions specialized particularly in Textile, Wearing Apparel and Leather tend to have comparatively greater value of this index. This is in line with reality as well. Pakistan has 8th largest textile industry in the world w.r.t exports. This justifies why specialization is influenced by it. Multan, Faisalabad and Karachi have relatively greater index because these contribute more in textile industry

Figure -1: Growth of Textile Industry in Pakistan.



Source: Ahmed (2012)

Figure-1, display the growth of textile industry in Pakistan during the period 2001 to 2011. Figure demonstrates that growth of textile industry is increasing up to 2004-05, and after that it is decreasing continuously. There are several reasons for this downtrend such as depreciation of Pakistani rupee which raised cost of imported inputs, severe energy crises etc dreadful law and order conditions and global recession.

The next two tables will provide Herfindahl indices of spatial concentration by region (see Table-2) and by industry (see Table-3). The indices for spatial concentration by region and industry aimed at identifying if various industries are located in a region and if there is spatial concentration of a particular industry in the 14 major cities, sacrificing the individuality of industry and region respectively. Spatial concentration by region explored if there exists industrial concentration in a region without identifying the type of industry concentrating their relatively more than other

industries. While spatial concentration by industry explained if a particular industry is concentrated spatially in a specific region of Pakistan failing to reflect in which region this particular industry clusters relatively more or has a comparative advantage in which industry.

Table-2: Spatial Concentration Index by city

Major Cities / Year	1999-00	2005-06	2010-11	2012-13
Lahore	0.169078	0.12900	0.30033	0.354022
Faisalabad	0.02714	0.01342	0.01688	0.018297
Rawalpindi	0.00425	0.00120	0.00262	0.003616
Multan	0.00411	0.00283	0.00299	0.002063
Gujranwala	0.00965	0.00732	0.00917	0.017649
Sargodha	0.00025	0.00017	0.00025	0.000548
Sialkot	0.00556	0.00151	0.00748	0.001498
Bahawalpur	0.00032	0.00027	0.00009	0.000331
Islamabad	-	0.00008	0.00020	0.000042
Karachi	0.33537	0.42407	0.44652	0.508351
Hyderabad	0.00221	0.00273	0.00132	0.002019
Sukkur	-	0.00005	0.00006	0.000059
Peshawar	0.00144	0.00150	0.00151	0.001362
Quetta	0.00003	0.00007	0.00008	0.000112

Source: Author's calculations.

Location influence spatial concentration and so does this index. Regions with locational advantage facilitate industrialization and thus tent to possess higher values of this index in comparison with those lacks it. Among the cities considered here Karachi has the highest value of this index as it is the only port city in Pakistan. The next considerable concentration is found in Lahore. This might be due to well-developed infrastructure in Lahore.

Table-3: Spatial Concentration Index by Industry.

Industry / Year	1999-00	2005-06	2010-11	2012-13
Food, Beverage and Tobacco	0.05	0.023	0.025	0.018
Textile, Wearing Apparel and Leather	0.108	0.056	0.049	0.037
Wood and Wood Products including Furniture	0.06	0.029	0.036	0.020
Paper and Paper Products, Printing and Publishing	0.173	0.146	0.174	0.112
Chemicals & Chemical Petroleum, Coal, Rubber & Plastic Products	0.191	0.114	0.128	0.068
Non-metallic Mineral Products excluding coal and petroleum	0.052	0.024	0.026	0.024
Basic Metal Industries	0.125	0.209	0.292	0.288
Fabricated Metal Products, Machinery and Equipment	0.074	0.092	0.044	0.032

Source: Author's calculations

The concentration index measures the overall concentration of industries without specifying a particular region where this concentration is occurring. Though, any industry in our country is not concentrated at a specific region. Concentration can be viewed in relative terms Spatial concentration index by industry reveals that food, beverages & tobacco and textile industry in Pakistan is getting dispersed spatially while that of basic metal industries tends to concentrate by location. The rest of industries do not show any considerable changes within a time interval under consideration.

Now for the growth of a particular region it is crucial to identify in the production of what that region has a comparative advantage in, because, eventually, that becomes the base for that region's economic growth. For analyzing economic base for individual cities, location quotients are calculated. Location quotient is a ratio of share of employment or production of a particular industry in a particular region's overall employment or production by all industries divided by the share of employment or production of that particular industry in the overall employment or production by all industries and regions nationally. Table 4.7 and 4.8 present the calculated location quotients of the 14 major cities in Pakistan for the years 2005-06 and 2012-13 respectively enabling easy identification of economic bases for each city.

Values of the location quotients greater than 1 means that the region has a comparative advantage or potential in that particular industry to grow and become the economic base of that region, The magnitude the its value identifies that among all the industries with greater than 1 value for location quotient which industry has the highest comparative advantage in that region.

Table4.7: Economic base (location quotient) statistics of cities for 2012-13

Economic base (location quotient) statistics of cities														
CITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOCATIONAL QUOTIENT 2012-13														
Food, Beverage and Tobacco	0.64	0.68	1.22	0.87	0.73	0.38	0.14	0.34	1.93	0.50	1.04	2.14	0.98	0.77
Textile, Wearing Apparel and Leather	0.87	1.59	0.49	0.95	0.85	0.32	1.06	1.22	0.29	1.29	0.81	0.63	0.83	0.59
Wood and Wood Products including Furniture	0.49	0.25	1.53	1.38	0.78	2.68	0.34	1.34	1.97	0.63	1.45	1.18	1.80	2.77
Paper and Paper Products, Printing and Publishing	4.63	1.31	2.05	1.39	1.66	2.54	0.03	2.77	0.00	1.15	1.12	0.81	1.60	0.54
Chemicals and Chemical Petroleum, Coal, Rubber and Plastic Products	2.34	0.56	1.15	1.21	1.49	0.00	0.07	0.86	5.63	1.54	2.46	1.50	3.65	2.10
Non-metallic Mineral Products	0.15	0.11	0.50	0.25	0.34	0.00	0.00	0.94	2.65	0.26	1.30	0.22	0.58	0.00
Basic Metals	0.78	0.00	0.81	0.00	4.73	0.00	0.00	0.00	0.00	3.60	0.25	0.00	1.12	0.00
Fabricated Metal Products, Machinery and Equipment	1.41	0.66	0.89	1.63	2.33	0.99	0.21	0.43	0.00	0.61	0.47	2.14	0.40	0.98
Other Manufacturing Industries and Handicrafts	1.41	0.37	1.35	1.19	1.17	4.43	4.11	0.61	0.00	0.82	2.97	1.09	0.57	2.24

Where,

1	Lahore	**4**	Multan	**7**	Sialkot	**10**	Karachi	**13**	Peshawar
2	Faisalabad	**5**	Gujranwala	**8**	Bahawalpur	**11**	Hyderabad	**14**	Quetta
3	Rawalpindi	**6**	Sargodha	**9**	Islamabad	**12**	Sukkur		

For the year 2012-13, the values of location quotient of various manufacturing industries in major 14 cities of Pakistan are tabulated in table 4.7.

From the table it is apparent that for Lahore the values of location quotients are greater than one for three major industries and highest (4.63) for paper and paper products, printing and publishing. Lahore is more efficient in production of this particular industry across all cities and thus this industry can play a vital role in the development and growth of Lahore city. Rawalpindi (2.05) and Bahawalpur (2.77) also have a comparative advantage in paper and paper products, printing and publishing industry along with other 3 and 2 industries respectively. Textile, Wearing Apparel & Leather industry is the economic base for Faisalabad and Sialkot as per their location quotients values 1.59 and 1.06 respectively. This is in line with the reality as well, as these cities are the major efficient producer and exporter of textile and leather products. Faisalabad has a comparative advantage in it across cities as well. Gujranwala is an efficient producer of metal industry including basic metal (4.73) and fabricated metals products (2.33). For Sargodha the industry for wood and wood products has potential to grow.

The industrial base of Islamabad is chemicals and chemical petroleum, coal, rubber and plastic products industry with a value of 5.63. Fabricated metal products, machinery and equipment (1.63) emerged as a pedestrian for economic growth potential in Multan. For Karachi the potential for growth is comparatively concentrated in the growth of metal product industry. Handicraft traditionally serves as the growth base for Hyderabad and the same fact is apparent from its location quotient figure (2-97). Food, beverages and tobacco industry appeared as an economic base for Sukkur along with fabricated metal products, machinery and equipment having the same value of location quotient (2.14). Peshawar and Quetta has a comparative advantage in the industry of chemicals, chemical petroleum, coal, rubber & plastic products (3.65) and wood & wood products including furniture (2.77) from their growth point of view respectively.

Table 4.8: Economic base (location quotient) statistics of cities for 2005-06

Economic base (location quotient) statistics of cities														
CITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LOCATIONAL QUOTIENT 2005-06														
Food, Beverage and Tobacco	0.55	0.84	0.71	0.84	0.88	1.37	0.13	1.12	0.44	0.44	1.23	2.66	1.11	0.50
Textile, Wearing Apparel and Leather	0.81	1.39	0.93	1.29	0.86	0.52	0.81	0.97	0.76	1.13	0.84	0.75	0.57	0.66
Wood and Wood Products including Furniture	0.40	0.59	0.92	0.79	1.10	1.14	1.15	1.24	0.22	0.66	0.84	0.20	1.10	2.13
Paper and Paper Products, Printing and Publishing	2.89	0.91	0.70	1.10	0.81	0.47	0.24	1.32	3.12	1.79	2.51	1.01	2.65	2.81
Chemicals and Chemical Petroleum, Coal, Rubber and Plastic Products	1.72	1.36	1.20	0.10	0.55	3.59	0.41	1.61	4.77	1.77	1.73	2.73	4.00	4.42
Non-metallic Mineral Products	0.19	0.05	0.78	0.10	0.07	0.39	0.05	0.28	0.11	0.10	1.00	0.63	0.30	0.20
Basic Metals	1.64	0.00	0.00	0.00	1.47	0.00	0.53	0.62	0.00	2.53	0.86	1.69	0.36	0.00
Fabricated Metal Products, Machinery and Equipment	2.78	0.37	1.28	0.82	3.26	2.97	4.41	0.73	1.08	1.09	0.46	1.30	1.24	1.46
Other Manufacturing Industries and Handicrafts	1.31	0.08	2.74	1.25	0.67	1.50	1.22	1.93	3.13	0.75	2.33	0.51	3.00	0.72

Where,

1 Lahore **2** Faisalabad **3** Rawalpindi **4** Multan **5** Gujranwala **6** Sargodha **7** Sialkot **8** Bahawalpur **9** Islamabad **10** Karachi **11** Hyderabad **12** Sukkur **13** Peshawar **14** Quetta

Location quotients are also calculated for the year 2005-06 to analyze if there has been a change of base from 2005-06 to 2012-13 for any city. The economic base for Lahore and Faisalabad is same as that in 2012-13 i.e paper and paper products, printing and publishing industry in Lahore (2.89) and textile, wearing apparel & leather industry for Faisalabad (1.40). Likewise the economic base for Islamabad and Gujranwala is also consistent with more chemicals and chemical petroleum, coal, rubber and plastic products industries locating in Islamabad and metal industries in Gujranwala including basic metal (1.47) and fabricated metals products (3.26). Islamabad has a comparative advantage over all other cities in the production of chemicals and chemical petroleum, coal, rubber and plastic products with the highest figure of 4.77 in 2005-06 and 5.63 in 2012-13.

For the remaining cities in Punjab there has been a shift in the industry serving as their economic base. In 2005-06, the location quotient values for Rawalpindi, Multan, Sargodha, Sialkot and Bahawalpur are 1.28, 1.29, 3.59, 4.41 and 1.93 respectively in the industries of chemicals and chemical petroleum, coal, rubber and plastic products in Rawalpindi and Sargodha, textile, wearing apparel & leather production in Multan, fabricated metal products, machinery and equipment in Sialkot and lastly, Handicraft and others manufacturing in Bahawalpur.

For the cities of Sindh, Baluchistan and KPK there has been no change of economic base from 2005-06 to 2012-13. Karachi is relatively more specialized in basic metal industry (2.53), Hyderabad in Handicraft and others manufacturing industry (2.53), Sukkur in food, beverages and tobacco industry (2.66), Quetta in wood & wood products including furniture (2.73) an finally, Peshawar in chemicals, chemical petroleum, coal, rubber & plastic products (4.00).

Conclusion and Policy Implication

Cities are center of economic growth, creativity and modernization. The economic structure of cities is of immense importance not only from the point of view of city development and growth but also for the national development and growth. It is better to understand city dynamics for understanding national growth and development. Despite of the crucial importance of cities, unfortunately in Pakistan city level analysis is rarely cited. This research makes an attempt to fill this gap in the existing literature in the context of Pakistan.

Herfindahl index for regional specialization and geographical concentration are calculated using industrial employment both by industry and by region. It is found that regions specializing in Textile, Wearing Apparel and Leather tend to have comparatively greater value of this index. This is in line with reality as Pakistan naturally has a comparative advantage in agro based industries especially those drawing raw materials from the domestic markets. This justifies why specialization is influenced by it. Multan, Faisalabad and Karachi have relatively greater index because these contribute more in textile industry

Herfindahl index for spatial concentration is calculated from two aspects. One measures spatial concentration of a particular industry (Herfindahl index for spatial concentration by industry) considering employment in industries across the national boundaries whiles the other reveals if a particular region is experiencing a concentration of different industries in it (Herfindahl index for spatial concentration

by region). Among the cities considered here Karachi has the highest value of this index as it is the only port city in Pakistan. Industries are increasingly clustered in Lahore on account of having a well equipped infrastructure. Spatial concentration using industry as a numeraire indicated that in Pakistan basic metal industries tends to concentrate spatially while that of textile industry and food, beverages & tobacco industry are getting dispersed by location

Location quotient analysis revealed the base for economic development for major cities. From this analysis it is observed Karachi has a comparative advantage in basic metals industry, Sukkur in food, beverages and tobacco industry, Hyderabad in handicraft & other manufacturing industries, Lahore in paper and paper products industry, Faisalabad in textile and wearing appraisal industry, Islamabad and Peshawar in chemical & chemical, petroleum, coal, rubber and plastic products, Gujranwala in basic and fabricated metal products, Quetta in wood & wood products. The economic base of all these cities are consistent from 2005-06 to 2012-13.

There has been a change of economic base observed for the left over 5 cities of Punjab namely Rawalpindi, Multan, Sargodha, Sialkot and Bahawalpur. Rawalpindi has a comparative advantage in chemical and chemical petroleum, coal, rubber and plastic products but in 2012-13its base changes to paper & paper product, printing and publishing industry though its value for chemical and chemical petroleum, coal, rubber and plastic products industry is also greater than 1 as well indicating its potential to grow this industry as well. In 2005-06, textile, wearing apparel & leather industry has been the economic base for Multan though in 2012-13 paper and paper products industry becomes its economic base. Likewise in 2005-06 Sargodha, Sialkot and Bahawalpur has relative potential in the growth of chemical and chemical petroleum, coal, rubber & plastic products industry, fabricated metal products, machinery & equipment industry and handicraft & others manufacturing while in 2012-13 these cities are relatively more efficient in the production of wood & wood products, textile, wearing apparel & leather products and paper & paper product, printing & publishing respectively. Once the economic base of a city is identified, strategy for developing that city can easily be formulated keeping its economic base for potential growth in mind.

Spatial concentration of industries grab a lot of positive benefits, similar industries located in a closed proximity can reduce their per unit cost of production and improve their efficiency & productivity via positive externalities arising from labour sharing, cost sharing, knowledge spill over etc. The comparative advantage achieves from this increase in efficiency and productivity makes that region an effective driver of economy. Considering the importance of this fact government should subsidize production in specialized cities especially, to increase its efficiency in and quality of production which in turn facilitate growth of that city along with its regional and international trade. Further, government should encourage and favour production of industries which has the potential to become the economic base for cities so as to accelerate their growth and participation in trade.

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