The Pakistan Development Review
32:4 Part II (Winter 1993) pp. 1267–1277

Growth of Manufacturing Employment in Pakistan: A Comparative Analysis of Punjab and Sindh (Preliminary Results)

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INTRODUCTION

Provincial economic disparities in Pakistan are often discussed in political circles. Recently, these disparities have also caught the attention of economic planners.[1] However, very few professional studies have analysed the issue due to paucity of inter-provincial data. Moreover, the existing studies base their analysis on cross-sectional data obtained from various sources and cannot be used to analyse disparities in economic growth and its sources.[2]

The purpose of present paper is to provide an initial contribution to the analysis of provincial economic changes in Pakistan. Employment growths in the manufacturing sectors of Punjab and Sindh are analysed for the period 1980–87. Regional differences in employment growth are usually attributed to differences in industrial structure and also to differential impacts of regional-specific influences (infra-structure, policies, political situation, etc.) that determine competitiveness of a region. The present study analyses these two components of growth for Sindh and Punjab in order to explain differential growth in these provinces. Such an analysis is useful for provincial planning as it may help plan for a balanced growth.

METHOD OF ANALYSIS

In order to assess changes in manufacturing employment in Punjab and Sindh, a Shift-share analysis has been used.

Shift-share analysis is a method of disaggregating regional growth performance (say in terms of employment change) into change that would have occurred had the national average applied in the region (the "share"), the change

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[1]For instance, the 7th Five Year Plan includes Special Development Programme (SDP) as an important component. The SDP is specially designed for target areas and schemes falling in Punjab, Sindh, NWFP, Balochistan and Azad Kashmir. The programme envisages a total expenditure of Rs 25.3 billion as against Rs 6.3 billion allocated for SDP in the Sixth Plan. For details please see Aslam (1991).

[2]Using data from diversified sources, Pasha and Hasan (1982) have quantified the levels of development in the districts of Pakistan for the year 1970. In an earlier study, Helbock and Naqvi (1976) also compared development indicators for districts for the 1960s.

associated with the mix of fast and slow-growing industries in the region (the "industrial shift"), and the change resulting from other conditions specific to the region itself (the "differential shift").

In this paper the shift-share approach is used as the basis of the employment growth model used for analysing the provincial regional economic growth in Pakistan. The method is easily explained using three definitions.

(1) Regional growth rate (g_r)

$$g_r = \frac{(\Sigma r_i^t - \Sigma r_i^0)}{\Sigma r_i^0}$$

where

ri = regional employment in industry i;
Σr_i = sum of employment across all industries in the region;
t = final year of study period; and
0 = initial year of study period.

(2) National growth rate (g_n)

$$g_r = \frac{(\Sigma n_i^t - \Sigma n_i^0)}{\Sigma n_i^0}$$

where

n_i = national employment in industry; and
Σn_i = sum of employment across all industries in the national economy.

(3) Regional growth at national growth rates per industry (g_m)

$$g_r = \frac{(\Sigma r_i^0 (n_i^t/n_i^0) - \Sigma r_i^0)}{\Sigma r_i^0}$$

This is the crucial calculation. It is the growth rate that would have occurred in the region if each industry had grown at the same rate as the corresponding national industry during the study period. In other words, national growth rates are applied to the region's industry mix as it existed at the beginning of the study period.

With the help of these three definitions, the regional growth rate can be divided into three separate elements:

$$g_r = (g_r - g_m) + (g_m - g_n) + g_n$$

Taking the elements in reverse order, the third element (g_n) is the region's 'share' of national growth. The faster the national growth in employment, the faster we expect the region to grow. The second element ($g_m - g_n$) is the structural shift component. It is the difference between:

(i) The rate at which we expected the region to grow (given its industry mix and given national growth rates for each industry); and
(ii) the national growth rate.

Thus, if the industry possesses a 'favourable' industry mix we would expect this element to be positive since g_m would exceed g_n in that case. If the region is endowed with an 'unfavourable' industry mix we would expect this element to be negative since g_n would exceed g_m. Finally, the first element ($g_r - g_m$) is the differential shift component. It is simply that part of the region's growth that remains unexplained. It is a residual, or a 'rag-bag' which can be given a wide variety of interpretations [Mackay (1968)]. A positive residual ($g_r > g_m$) means that the region's growth rate has exceeded the growth rate that would have occurred if each industry in the region had grown at the same rate as its national counterpart. A negative residual ($g_r > g_m$) means the reverse.

The above method of analysis has been criticised on several grounds in the literature.[3] Leading criticisms of the method are that results are sensitive to the degree of industrial disaggregation and the base year used in the analysis, the "shift components are not entirely independent, and the "differential shift" is unstable over time.

Despite its drawbacks the shift-share analysis provides a starting point for measuring the effect of a region's industry-mix on its employment growth. After extensive testing on the U.K. data, Forthergill and Gudgin (1979) have concluded that the limitations of the technique are not strong enough to seriously affect its usefulness in analysing regional growth.

DATA

The data used in this study are from the Census of Manufacturing Industries [Government of Pakistan (Various Issues)]? The period of analysis is 1980–1987.

The CMI is conducted annually under Industrial Statistics Act, 1942 with a collaborative programme between Federal Bureau of Statistics, Provincial Directorate of Statistics and Bureau of Statistics. All factories, carrying on manufacturing and repairing activities and registered under the Factories Act 1934, are covered under the Census.

The published sources of CMI provide data on average daily employment for ten groups of manufacturing industries. A list of those industries is provided in

[3]For instance, see Houston (1967) and Mackay (1968).

Appendix I. As it is not known how the constituents of "other manufacturing" group have changed over time, this group was not included in the analysis.

In addition to the above data, we were also able to find further industrial breakdowns of provincial employment data for two groups of industries from the Development Statistics of the two provinces [Government of Punjab (1989) and Government of Sindh (1989)]. These are food, beverage and tobacco industry and textile, apparel and leather industry . Availability of this data enabled us to analyse components of growth separately for the two industries and compare the same for Punjab and Sindh.

ANALYSIS OF SHIFT-SHARE FOR PAKISTANI PROVINCES: 1980–87

During the seven-year period 1980 to 1987 average daily employment in Pakistani manufacturing sector rose by 16.42 percent. The two major economic and political rivals, Punjab and Sindh, accounted for more than 90 percent of national employment in manufacturing sector. As revealed in Table 1, these two provinces experienced significantly different rates of growth. Growth in Sindh was faster than the national average while growth in Punjab was lower. These differences in growth were responsible for a decline in Punjab's share in national employment by 3 percent, which probably appears as an increase in the share of Sindh.

Table 1

Shift-share Components in Manufacturing Employment, Punjab and Sindh, 1980-87 (%)

Province	Actual Growth	Change in Share of National Employment	Relative Growth[1]	Industrial Shift	Differential Shift
Punjab	9.8	–3.0	–6.7	–0.5	–6.1
Sindh	24.0	2.8	7.6	–1.1	8.7
Pakistan	16.4				

[1]Difference between provincial and national growth rates.

In Sindh, the basic metal industry experienced the fastest employment growth (353 percent or an employment gain of 22183 workers), while in Punjab the same sector grew at a slower pace (14 percent or an employment gain of 1658 workers). The Chemical industry in Sindh also grew at a faster rate than in Punjab (51 percent (a gain of 10716 workers) as compared to only 31 percent (a gain of 5682 workers)). The rate of growth in textile, the major source of employment in

manufacturing sector, was only 3.5 percent in Punjab while in Sindh, the textile sector experienced a decline of 2 percent. The food, beverages and tobacco sector, another important source of employment, experienced a 14 percent increase in Sindh and 19 percent increase in Punjab.

Of greater interest is the composition of the total shift or net relative change in terms of its two components: the industrial shift and the differential shift. These components are also shown in Table 1. The industrial shift component was negative for both Punjab and Sindh. This means that, at the beginning of eighties, the two provinces possessed poorer industrial structures characterised by a predominance of national slow growth industries. The most dominant industry in the two provinces is the textile industry which experienced only a 5.3 percent employment growth at national level during 1980-87.

The differential shift component was also negative for Punjab. This means that industries located in Punjab also suffered a competitive or locational disadvantage which arises due to negative influences of region-specific factors.

Contrary to Punjab, industries located in Sindh enjoyed a competitive advantage over those located elsewhere. Because of its competitive advantage, the manufacturing sector in Sindh was able to overcome the negative employment growth resulting from poorer structure.

DISAGGREGATION BY ANNUAL TIME PERIODS

Annual changes in manufacturing employment are provided in Table 2. Those results show that during the early eighties (first three years), Punjab experienced a decline in employment in its manufacturing sector. During the same time, Sindh experienced significant employment gains. This pattern is however reversed for both provinces in latter time periods. Employment grew at a slower rate in Sindh while in Punjab the growth rate was even higher than the national everage. A probable reason for this result is the significant recovery of the textile sector in Punjab since 1983. Textile sector in Sindh continued to decline over the eighties.

The annual industrial-shift component reveals that Punjab had an excess of fast growing industries for there was a negative shift in only one of the seven years. The province of Sindh experienced negative shifts in industrial shift component only in two of the seven years.

Of particular interest is the annual differential shift component. Punjab experienced negative shifts in the first three years and thereafter the province experienced postive shifts. This means that the province recovered its locational disadvantage over the rest of the nation in latter years. During that same time, Sindh lost its competitive advantage.

The results of annual differential shift components in Punjab and Sindh can be given different interpretations. Probably they reflect upon political instability in Sindh which has begun to show its effect on industrial growth. These results could also reflect upon policies designed to improve the competitiveness of a province.

traditionally been major sources of employment generation in Pakistani manufacturing, accounting for more than one-half of total employment.[4]

From the Development Statistics, employment data on five divisions of the TA&L sector are available for the two provinces. These divisions include: Cotton, Jute, Wool, Leather tanning, and Footwear. Similarly, provincial data on the following divisions of the FB&T sector are available: Vegetable Ghee, Sugar, Beverages and Cigarettes. For the purpose of present analysis, the CMI data was used as total employment in each sector. Since each sector has many more industries than those noted above, a new division "others" was created for each sector to account for residual employment. Furthermore, since national employment data by divisions were not available to the authors at the time of the study, provincial employment data in the two sectors was aggregated to obtain the benchmark national employment.[5]

Table 3 provides the relevant shift-share results for the two industrial sectors. It is observed that during 1980–87, Punjab experienced a 3.5 percent increase in employment in its TA&L sector while Sindh experienced a 1.8 percent decline. The growth rate in Punjab's TA&L industry even exceeded the national rate.

The reason for better performance of Punjab's TA&L sector is attributed to its favourable structure which alone was responsible for around 10 percent increase in employment. The province of Sindh possessed an unfavourable structural mix of TA&L sector at the start of decade which alone accounted for a 13.8 percent decline in employment in that industry.

The differential shift component of employment growth shows that region-specific factors in Punjab slowed employment growth in the province's TA&L industry by causing a 7.6 percent decline in employment. On the other hand, the same industry in Sindh enjoyed a locational advantage which helped offset some of the effect of its poorer structural mix by causing a 10.7 percent increase in employment.

The growth results for FB&T industry are also summarised in Table 3. Both provinces experienced employment gains in this industry during the period 1980–87. However, employment in Punjab grew faster than the national employment in this industry while Sindh experienced slower growth. Punjab had both structural and locational advantage in this industry while Sindh had an unfavourable structure and also a locational disadvantage.

[4]Later, when consistent data are available, we wish to analyse the growth components in all manufacturing sectors.

[5]In the Food, Beverage and Tobacco sector, Punjab and Sindh together account for more than 80 percent of total national employment in that sector. Also, more than 90 percent of national employment in the Textile, Apparel and Leather sector, is created in Punjab and Sindh together. Hence it is expected that sectoral growth in employment combined for the two provinces will reflect national sectoral growth.

Such policies may have succeeded in Punjab but failed in Sindh due to political instability. A future research should explore this issue.

Table 2

Annual Shift-share Components in Manufacturing Employment: Punjab and Sindh (%)

	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Punjab							
Growth							
Actual	−1.9	−1.7	−4.7	2.5	4.9	3.1	5.7
Relative[1]	−2.6	−1.3	−5.3	2.8	5.1	3.3	5.5
Industrial Mix	1.1	3.7	−1.7	2.4	3.6	2.8	4.7
Differential Mix	−3.7	−5.0	−3.6	0.4	1.5	0.5	0.8
Sindh							
Growth							
Actual	10.2	12.0	0.1	2.1	2.7	0.8	4.7
Relative[1]	9.2	8.3	1.8	−0.3	−0.9	−2.0	0.0
Industrial Mix	1.7	−1.0	0.9	0.5	0.2	0.3	−0.5
Differential Mix	7.5	9.3	0.9	−0.8	−1.1	−2.3	0.5

[1]Difference between provincial and national growth rates.

DISAGGREGATION BY INDUSTRY

A disaggregation of our analysis by industry is constrained by the paucity of data. The published issues of CMI do not provide datailed breakdown by industry. However, some breakdown for the provinces of Punjab and Sindh are published in the Development Statistics of the two provinces. We use these data to analyse growth components in textile, apparel and leather (TA&L) sector and food, beverage and tobacco (FB&T) sectors of the two provinces. These two sectors have

Table 3

Shift-share Components of Employment Growth in Selected Manufacturing Industries, Punjab and Sindh, 1980–87 (%)

Textiles, Apparel, and Leather		
National Growth 1.3		
	Punjab	**Sindh**
Growth		
Actual	3.5	−1.8
Relative[1]	2.2	−3.1
Industrial Shift	9.8	−13.8
Differential Shift	−7.6	10.7
Food, Beverages and Tobacco		
National Growth 11.9		
	Punjab	**Sindh**
Growth		
Actual	13.7	9.7
Relative[1]	1.8	−2.2
Industrial Shift	1.0	−1.2
Differential Shift	0.8	−1.0

[1]Difference between provincial and national growth rates.

FUTURE RESEARCH PLAN

The above results are preliminary. At a later stage, we wish to improve these results by including more recent data on manufacturing employment. It is also our intention to include data for pre 1980 period after adjusting with the non-response survey. We also wish to analyse, for each province, the growth components separately for all industries in the manufacturing sector. Such an analysis will shed light on the causes of slower or faster growth of an industry in a province. In addition, it will also help in identifying where a particular industry enjoys locational advantage. A disaggregated analysis at district level in each province will also be undertaken to identify regions offering competitive advantage in particular manufacturing industries. Finally, depending upon data availability, reasons for a region's competitive advantage or disadvantage in an industry may also be investigated in a regression model.

Appendix I

List of Industries

1. Food, beverage and tobacco.
2. Textile, apparel, and leather.
3. Wood, wood products and fur.
4. Paper, printing and allied.
5. Chemical, rubber and plastic.
6. Non-metallic mineral product.
7. Basic metal industries.
8. Metal products and machine equipments.
9. Handicrafts, sports and others.
10. Other manufacturing.

Due to ambiguity about the constituents of "Other manufacturing", it was decided not to include this group in our analysis.

REFERENCES

Aslam, M. (1991) *Perspective on Development Planning in Pakistan.* Lahore: Bilal Books.

Fothergill, S., and G. Gudgin (1979) In Defense of Shift-Share. *Urban Studies* 16: 309–319.

Helbock, R. W., and S. N. H. Naqvi (1976) Inter-district Variations in Social Well-being in Pakistan. Islamabad: Pakistan Institute of Development Economics. (Unpublished paper.)

Houston, D. B. (1967) The Shift-Share Analysis of Regional Growth: A Critique. *Southern Economic Journal.*

Mackay, D. I. (1968) Industrial Structure and Regional Growth: A Methodological Problem. *Scottish Journal of Political Economy.*

Pakistan, Government of (1981, 1982, 1983, 1984, 1985, 1986, 1987). *Census of Manufacturing Industries.* Federal Bureau of Statistics (Annual).

Pasha, H., and T. Hasan (1982) Development Ranking of Districts of Pakistan. *Pakistan Journal of Applied Economics* 1:157–192.

Punjab, Government of (1988) *Punjab Development Statistics.* Lahore: Bureau of Statistics.

Sindh, Government of (1988) *Sindh Development Statistics.* Karachi: Bureau of Statistics.

Comments on "Growth of Manufacturing Employment in Pakistan: A Comparative Analysis of Punjab and Sindh (Preliminary Results)"

This is an interesting paper, though still in the making. The paper ends up with an agenda for future research rather than any firm conclusions and policy suggestions. The authors, nevertheless, deserve compliments for their pioneering effort at studying regional disparities in Pakistan by using Shift-share Analysis, a technique commonly used in the discipline of regional economics.

Inter- and intra-provincial socio-economic disparities have remained a serious challenge for Pakistan since the Fifties. Several economists and scholars of other disciplines mostly blame gross inter-wing differentials for the separation of East Pakistan during the early Seventies. A number of economists have, in the past, studied and analysed issues concerning regionalism in Pakistan. In view of this, it may be unrealistic to agree with the authors' opening remarks suggesting that "provincial economic disparities in Pakistan are often discussed in political circles. Recently, these disparities have also caught the attention of economic planners". Nevertheless, the authors complaint regarding non-availability of inter-provincial time series data on relevant variables is well-founded.

The title of the paper appears to be somewhat inappropriate as it does not correspond with the analysis which follows. While examining the growth of the manufacturing sector, the authors have exclusively concentrated on growth and changes in employment. Hence, it transpires that employment is being used as a proxy for growth of the manufacturing sector under the implicit assumption that employment and output are positively correlated which may not always be the case. Furthermore, factors like regional variations in choice of technology, capital/labour ratios, labour productivity differentials and inter-provincial variations in capacity utilisation should have been explicitly taken into account with a view to making the analysis more realistic and meaningful.

The authors have analysed employment growth using nine groups of industries out of ten such groups as reported in the Census of Manufacturing Industries (CMI). The tenth group i.e. "other manufacturing" has obviously been excluded for the reason that it is not known as to how the constituents of the excluded group behaved over time. It may, therefore, be suspected that the exclusion of such an important group from the analysis might have made the inter-provincial scenario of employment changes look like what it really is not.

As noted above, the study has employed Shift-share Analysis to ascertain changes in manufacturing employment. There is no denying the fact that Shift-share Analysis is a frequently used analytical tool for desegregating regional growth performance. Yet, as rightly noted by the authors, this methodology has been

criticised on the grounds that its "results are sensitive to the degree of industrial disaggregation and the base year used in the analysis, the shift components are not entirely independent and the differential shift is unstable over time". These inherent defects of the methodology seem to have considerably affected the analysis of the study as explained below.

The analysis is first attempted for the whole of the seven-year period, i.e.1980–87. This means that only changes in the base and the terminal year have been taken into account while the intervening years have been ignored. The calculations based on the total period show that employment in the manufacturing sector at the national level rose by 16.4 percent. Growth in Sindh was faster than the national average while Punjab was a slow growing province. On the contrary, disaggregation of analysis by annual time period shows that Pubjab during the first three years experienced a decline in employment (due to the recession in the textile sector) while Sindh gained in employment. On the other hand, Punjab experienced higher growth during the last 4 years. This clearly reflects the contradictions resulting from the inherent defects of the methodology used. Furthermore, it remains to be noted that the components of shift-share analysis need to be spelt out in greater detail to identify the real forces and factors working behind the observed changes.

The type of employment growth analysis attempted in the paper does not seem to be of much help in understanding and analysing socio-economic regional dispersion, the fundamental focus of the peper. This is due to the fact that a lot of inter-regional labour migration and resource transfers take place across provincial boundaries. For instance Karachi provides employment opportunities for the whole of Pakistan. Any gains and losses of employment as noted in the context of Sindh do affect other provinces as well. These issues deserve to be kept in mind while making any inter-provincial welfare comparisons.

The analysts should also bear in mind a new phenomenon which has emerged as a consequence of official policies adopted for the dispersal of industrial concentration and growth of lagging areas and regions. The entrepreneurs "instead of going deep into heartland of backward regions indulge in what is called border-hopping". Hub, for instance, is in Balochistan but for all practical purposes it is a satellite of Karachi. Gadoon provides yet another example of the same phenomenon. This type of scenario is likely to have very serious regional implications and therefore deserves careful consideration.

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