

Analysis, modeling and optimization of regional development in Sistan & Balochestan combining labor market, shift-share and genetic algorithm models

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ABSTRACT

The present paper aims to analyze, model and optimize regional development of rural and urban areas of Sistan & Balochestan, separately. The relationship between employment changes and growth rate of economic sections has been modeled and numbers of jobs required for providing optimum growth rate have been obtained. This paper indicates that considering the average census of five decades (1956-2006) the situation of labor market and growth rate of economic sections in urban areas are bad and worse in rural areas so that there is need to increase employment considerably in order to achieve minimum economic growth rate (1% growth).

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1. Introduction

By 1960's development was defined as continuity of economic growth (Todaro, 1985). There are two different definitions of development, the first one, goes back to 1950's and 1960's, suggests that development is merely an economic phenomenon and considers that the main factor of development is economic growth. The second one is associated with 1970's until now proposes that economic growth is a tool by which one can achieve development rather than a goal of development and emphasizes on unemployment (Langroodi, 2003). In different definitions of development, it is concentrated on increasing social-human abilities to meet social-human needs, meeting current needs without reducing abilities of next generation so that regional development of the same definitions of development are restricted within spatial limit of the region (Sarafi, 1999). Two groups of theories about regional development can be considered. The first one is based on splitting social-economic activities, focusing on sectional planning such as theories of growth of economic sections and

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economic base. In these theories, capital accumulation, new resources, growth of labor force and improvement of technology are the main factors of economic growth in this region. The second group is based on priority of spatial domain of humans and activities and integrating them in environment, relying on spatial planning such as agropolitan and growth pole theories (Sarafi, 1999). In this regard, theories such as international trade theory, sectional theory and theory of common goods are generalized from national to regional level (Zari, 2004b).

1.1. International trade theory: This theory considers relative advantage of the region and focuses on its specialization rather than diversification to obtain more income through export, which is the source of capital accumulation and growth cycle (Sarafi, 1999).

1.2. Sector theory: Increase in per capita income is associated with resource reallocation so that in primary activities (mine and agriculture) employed human force is decreased and in secondary sector (industry) and then in the third sector (service) employed human force is increased (Ziari, 2004b).

1.3. Common goods theory: It considers external forces as factor determining regional growth and focuses on export of regional common goods. So, using open policies regional development starts from areas having valuable natural resources, and resources outside the region are utilized for its productivity and export (Ziari, 2004b). Export based theory is one of the most important theories in regional development. The essential element of this theory is that regional income is determined by the region's exports (Richardson, 1978). In this theory, an urban area is seen as an open economy, which depends on external trade and there is a distinction between basic and dependent industries. Basic industries are those, which sell their product outside the area, providing employment and bringing in income to the area. Dependent industries are those, which sell their product to the local economy. In other words, basic activities are export-oriented activities, which have direct and indirect impacts on urban and regional development (Illeris, 1989). Change in external demand for an area's exports is very important in influencing the stability of an urban area.

Sistan & Balochistan is located in southern east of Iran. This region has had the lowest level of development among other provinces of the country before and after Islamic revolution. (Afrakhte, 2004). A study on the economic sectors of this province from the first census (1956) through the last one (2006) indicates that there are specific underdevelopments implying there is too much requirement for study development issues in general and regional development in particular. In the province factors such as economic recession in villages, unemployment of large number of redundant force in agriculture sector, improper expansion of service infrastructures in villages, drought, and successive floodwaters in the region on one hand, and employment backgrounds and better income in cities, employment and activities opportunity in abroad (Pakistan and Persian gulf states) etc., on the other hand, have increased rural migration rate during the last decades so that from 1966 until now more than 600,000 people have out-migrated from Sistan & Balochistan (Ebrahimzadeh, 2001).

This paper considers regional development of Sistan & Balochistan from viewpoint of economic growth theories and is more based on sectional planning than spatial planning. Although the main purpose of the paper is to provide a new combined method in regional studies, data obtained on development of Sistan & Balochistan is macroeconomic results used in spatial planning for the province. The main questions raised in the paper are as follow:

1. During the five aforementioned decades, how was the condition of labor market and growth of economic sectors in urban and rural areas separately, and what is the relationship between variables affecting on development of Sistan & Balochistan? (Analysis).
2. What is the model that the economic position of urban and rural areas follows? (Modeling).
3. If the average growth rate of each economic sector during the five decades is considered as optimum growth rate, what changes should

occur in each economic sector to achieve it? (Optimization).4. How can one obtain a better identification by combining different models? (Methodology)

The most important purpose of the paper is to provide a combined method for regional development studies, which would be considered during the process of the research. Answering the questions raised requires analysis, modeling and optimization of regional development in Sistan & Balochestan. Therefore, the viewpoint dominated on the research is systematic. Based on the definition that a system is a process during which based on given rules there is an action and reaction among system elements on one hand and external environment on the other hand (Hall & Tewdwr-Jones, 2010) one can consider a geographical region as a system. We can analyze function and structure of geographical region using systematic approach so that targeted function can be obtained by providing planned changes in the structure of the region.

System analysis means determining system borders, identifying components of system and their mutual relationships, determining links collecting components of system, ranking components of system, ranking their links together, determining variables indicating flows, determining variables indicating different positions of system and other cases such as determining cycles of negative and positive reactions(Meadows, 2008).

2. Research process model

The first step in this paper is to provide the necessary data for the analysis. Among outputs of labor market and shift-share models, employment changes (DE) and growth rate (GR), respectively were incorporated where DE was considered as independent variable and GR was considered as dependent variable. Models obtained from regression were incorporated the model as genetic algorithm data and outputs of the model is optimization of economic condition of rural and urban areas (Fig. 1). Modeling was performed in SPSS software and optimization by MATLAB software. Research method is quantitative and analytic.

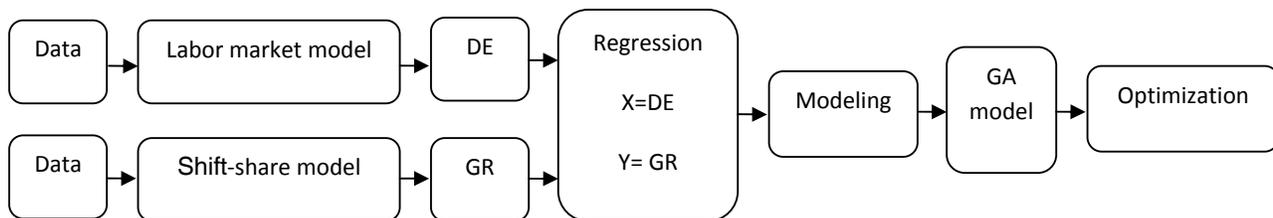


Fig. 1. The conceptual framework of the research

2.1. Labor market model

It is a quantitative tool indicating supply and demand of labor force in a given period where we can show the effects of employment changes on migration, unemployment and commuting (PHODES & TYLER, 1998). Components of labor market model and their explanations are shown in Table1.

Table 1

Component of labor market accounts

Component	explanation	Component	Explanation
L	Size of labor force	$DL=L-L_{-1}+YXM$	Internal change in the labor force
W	working age population	$DN=(W-W_{-1}) Y_{-1}+XMY_{-1}$	The natural increase in the labor force
E	Total employment	$DA=W(Y-Y_{-1})+XM(Y-Y_{-1})$	Changes in participation rate
U	Total unemployment	$DE=E-E_{-1}$	Changes in employment
$Y=L/W$	Participation rate	$DS=DU-YXM+DC$	Net change in employment shortfall
$X=W/P$	Proportion of the population of working age	$DU=U-U_{-1}$	Changes in unemployment
YXM	net out- migration	DC	Changes in net out-commuting

2.2. Shift-share model

Shift share analysis was first developed by Dunn (1960) as a method to determine sectors describing changes of economic variables especially employment (Matias et al., 2007). Despite its limitations, shift-share was employed extensively in growth analysis of economic variables. The main advantage of shift-share technique is its simplicity as well as the fact that shift-share does not require initial dataset (Yasin et al., 2005). Components of shift-share model are shown in Table 2.

Table 2

Component of shift-share model

Explanation	Explanation
Total employment in the reference economy	Growth element of reference economy
Employment in sector i of reference economy	Relative growth element of economic sectors in the total reference economy
Employment of sector i in the reference economy	Performance element of each sector in the area relative to function of the same sector in the reference economy
Employment of sector i in the local level	Changes in employment of each economic sector of studied area

2.3 GA model

Evolutionary computing was introduced in the 1960s by Rechenberg in the work “Evolution strategies”. This idea was then developed by other researches. Genetic Algorithms (GAs) was invented by JOHN HOLLAND and developed this idea in his book “Adaptation in natural and artificial systems” in the year 1975. Holland proposed GA as a heuristic method based on “Survival of the fittest”. GA was discovered as a useful tool for search and optimization problems. Most often one is looking for the best solution in a specific set of solutions. The space of all feasible solutions (the set of solutions among which the desired solution resides) is called search space (also state space). Each and every point in the search space represents one possible solution. Therefore, each possible solution can be “marked” by its fitness value, depending on the problem definition. With GA, one looks for the best solution among a number of possible solutions represented by one point in the search space i.e.; GAs are used to search the search space for the best solution e.g., minimum. The difficulties in this case are the local minima and the starting point of the search (Akbari & Ziarati, 2011).

2.4 Outputs analysis of labor market model

Of seven outputs obtained from labor market model, all but DC have been computed for urban and rural areas during five decades of census (Table 3). The reason why DC wasn't computed is that there was not any periodical statistics of commuting in censuses in Iran so index of commuting changes DC was not computed in labor market computation.

2.5 Labor market analysis in urban areas

Study the indices of labor market in urban areas indicates that these areas have encountered with job shortfall DS during decades of one and five and job surplus in the second, third and fourth decades. After facing with job shortfall in the first decade and job surplus in three decades (second, third and fourth), these areas again met with employment shortfall in the fifth decade, so out-migration in the first and fifth decades and in-migration in other decades occurred. In urban areas, both in the first decade suffering from job shortfall and in the second, third and fourth decades experiencing job surplus, participation rate DA was negative. However, DA was positive in the fifth decade despite 67000 job shortfalls. This means that although there were too much job shortfalls, jobseekers satisfied with participation. This indicates that in the fifth decade, due to being worse of employment conditions jobseekers reduced their expectation level concerning the job they seek and were satisfied with participation in employment so that jobseekers considered having or not having job rather than

wanting or not because the more job shortfall was, the more limitation jobseekers encountered with. Intense reduction of size of labor force DL in decade three is due to large reduction in participation rate changes (DA) in this decade.

Table 3
Labor market accounts at urban areas in Sistan & Balochestan

	Decade (urban)	DL	DN	DA	DE	DS	YXM	DU
First	1956-1966	10363	122000	-18362	4749	98888	98614	274
Second	1966-1976	5227	5904	-679	19939	-14713	-15747	1036
Third	1976-1986	-24556	20655	-45220	48540	-73100	-50792	13695
Fourth	1986-1996	12254	29671	-17202	56704	-44343	-38122	-6471
Fifth	1996-2006	168396	140200	28246	101527	66869	12924	53945
Mean		52992	63686	-10643	46292	6720	1375	166701

Correlation between variables of labor market gives better identification of labor market situation (Table 4). Findings of Table 4 indicate that employment changes DE, (DU) and (DA) do not have any significant relationship with other variables of labor market. (DA) should have correlation with (DE) and (DS), so lack of correlation indicates that job shortfall or surplus (DS) as well as increase or decrease of change in employment (DE) play no role in increase or reduction of participation rate (DA). There is no significant correlation between (DL) and (DE) and lack of strong and direct correlation between the two variables indicates that position of labor market is not good so it should be attempted to provide a positive and direct correlation between (DL) and (DE) so that employment shortfall will not be seen. Positive and strong correlation between (DL) and natural changes of labor force (DN) indicates that (DN) plays more roles in increase and reduction of (DL) than (DA). Strong and direct correlation between (DN), (DS) and (DL) shows that as (DN) increased, (DL) increased, and, in turn, it increased (DS). Job shortfall originates from (DL) increase and in turn it results from (DN) increase and it stems from increase in population growth rate in this region. Therefore, the primary reason why there is employment shortfall in urban areas has been population growth rate and then inequality of (DE) and (DL). Positive and strong correlation between (DS) and net out-migration (YXM) indicates that in- migration to the urban areas has a direct and strong relationship with job surplus in these areas. A strong, direct and significant relationship between (DS) and (DN) on one hand and lack of a reversed and significant relationship between (DS) and (DE) indicates that the procedure of labor market situation in urban areas is function of natural changes of labor force (natural changes of labor force itself is a function of population growth rate).

Table 4
Correlation between indicators of labor market in urban areas

Urban areas		DL	DN	DA	DE	DS	YXM	DU
DL	Pearson Correlation	1	.960(**)	.758	.410	.886(*)	.665	.690
	Sig. (2-tailed)		.010	.138	.492	.046	.220	.197
DN	Pearson Correlation	.960(**)	1	.543	.308	.894(*)	.749	.612
	Sig. (2-tailed)	.010		.344	.614	.041	.145	.272
DA	Pearson Correlation	.758	.543	1	.511	.569	.248	.639
	Sig. (2-tailed)	.138	.344		.379	.316	.688	.246
DE	Pearson Correlation	.410	.308	.511	1	-.060	-.391	.800
	Sig. (2-tailed)	.492	.614	.379		.924	.515	.104
DS	Pearson Correlation	.886(*)	.894(*)	.569	-.060	1	.928(*)	.348
	Sig. (2-tailed)	.046	.041	.316	.924		.023	.565
YXM	Pearson Correlation	.665	.749	.248	-.391	.928(*)	1	.030
	Sig. (2-tailed)	.220	.145	.688	.515	.023		.962
DU	Pearson Correlation	.690	.612	.639	.800	.348	.030	1
	Sig. (2-tailed)	.197	.272	.246	.104	.565	.962	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

2.6. Labor market analysis in rural areas

As with urban areas, variables of labor market model have been computed during five decades for rural areas (Table 5).

Table 5
Labor market accounts at rural areas in Sistan & Balochestan

Decade (rural)	DL	DN	DA	DE	DS	YXM	DU
First 1956-1966	18280	29898	-10463	-21859	40139	35081	5067
Second 1966-1976	30322	112218	-81934	29509	813	-294	1107
Third 1976-1986	16038	-24841	16038	-5852	21902	4915	16992
Fourth 1986-1996	20959	27109	-6072	41461	-20423	-11823	-8600
Fifth 1996-2006	181903	148202	33795	16469	165434	64363	101071
Mean	53516	58517	-4759	11946	4813	18448	23127

Table 5 indicates that in the second decade rural areas have accepted migrants due to insignificant job shortfall. Job redundancy occurred only in the fourth decade and was not replicated in any decade. In decades of one, three and five rural areas did not have appropriate situation and faced with job shortfall and out-migration. The worst decade is fifth one. High population growth rate in the third decade in Sistan & Balochestan (6.07) led those born in that decade to join jobseekers in the fifth decade and caused to increase DL. Consequently, because of inequality of DE and DL, rural areas faced with 165,000 job shortfalls in this decade. In the first and third decades, DE was negative and there was job shortfall; however, in the second and fifth decades, DE was positive and job surplus was observed. Despite increase of 16000 jobs in the fifth decade, there were 165000 job shortfalls. The reason is that DL increased more than DE. DL increase resulted from simultaneous increase of DN and DA (DN increase is due to high population growth rate in the province in the third decade). Although there was job shortfall in the fifth decade in rural areas, DA was high indicating indispensability of job in the life of people. Jobseekers participated in labor market in this decade in spite of job shortfall because they needed it. As DN increase in the fifth decade resulted from population growth rate in third decade, negativity of DN in the third decade also caused by population growth rate in the first decade, 1.61, being the least population growth rate in the province during five decades. Table 6 indicates correlation between variables of labor market.

Table 6
Correlation between labor market accounts variables in rural areas.

Rural areas		DL	DN	DA	DE	DS	YXM	DU
DL	Pearson Correlation	1	.764	.375	.145	.937(*)	.811	.968(**)
	Sig. (2-tailed)		.133	.534	.817	.019	.095	.007
DN	Pearson Correlation	.764	1	-.313	.397	.614	.543	.627
	Sig. (2-tailed)	.133		.609	.508	.271	.345	.258
DA	Pearson Correlation	.375	-.313	1	-.365	.499	.420	.525
	Sig. (2-tailed)	.534	.609		.546	.392	.481	.364
DE	Pearson Correlation	.145	.397	-.365	1	-.211	-.418	-.055
	Sig. (2-tailed)	.817	.508	.546		.733	.483	.930
DS	Pearson Correlation	.937(*)	.614	.499	-.211	1	.950(*)	.976(**)
	Sig. (2-tailed)	.019	.271	.392	.733		.013	.004
YXM	Pearson Correlation	.811	.543	.420	-.418	.950(*)	1	.858
	Sig. (2-tailed)	.095	.345	.481	.483	.013		.063
DU	Pearson Correlation	.968(**)	.627	.525	-.055	.976(**)	.858	1
	Sig. (2-tailed)	.007	.258	.364	.930	.004	.063	

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 6 indicates that in rural areas as well as urban areas, there is no significant relationship between each of DA, DN, DE and other variables of labor market. There is a direct and strong correlation between DL and DU as well as between DS and DL with confidence level being 99%. Lack of a significant relationship between DE and DL and a direct, strong and significant relationship between DS and DL indicate that as DL increases, DS increases too and DE as an intervening variable is not

able to moderate or remove correlation. Inability of DE to remove correlation between DS and DL shows that in rural areas labor market is a function of effective planning relating to providing job rather than increase of labor force. As DE increased, job shortfall increased too. This point indicates that size of increase of DE was not equal to DL and although jobs were provided, job shortfall occurred due to more labor force compared to jobs provided. DL increase led to DS increase and out-migration. Strong and direct correlation between DL and DN in urban areas by confidence level of 99% and in rural areas by 85% as well as lack of significant correlation between DL and DA indicate that job shortfall depends on labor force increase directly and strongly and it in turn results from natural increase of labor force so that changes in labor force depends on population growth rate. As with urban areas, situation of labor market in rural areas is more affected by unplanned factors especially population growth rate rather than predetermined plans.

2.7 Findings analysis of shift-share model

Except for employment, there is no other periodical statistics such as income, production, export etc. so employment statistic is used in shift-share analysis (ZIARI, 2004a). In this paper, urban areas of the province is referred to urban areas of the country and rural areas of the province is referred to rural areas of the province.

2.8 Economic sectors growth in urban areas

Identification of procedure of economic sectors has been performed using the quantity of practitioners of economic sectors (agriculture, industry and service) throughout five decades and average economic growth of each section has been obtained (Table7).

Table 7

Growing of economic sectors GR (A+B+C) in urban areas

	Decade					Mean
	First	Second	third	Fourth	Fifth	
Activity	1956-1966	1966-1976	1976-1986	1986-1996	1996-2006	
Agriculture	3.5	0	1.4	0.8	0.3	1.2
Industry	2.1	1.4	1.3	0.4	0.5	1.1
Service	0.5	1.2	1.3	0.9	0.9	0.9

Table 7 indicates that in urban areas during five decades studied, the highest growth rate of agriculture sector was 3.5 for the first decade, which reached to the least value in the second decade. The worst decade for agriculture sector was the second by 0 % growth rates. In spite of growth rate of 1.4% for agriculture sector in the third decade, growth procedure of agriculture section from third decade to fifth decade was descending indicating growth fall in this sector. Industry sector was of descending order, the highest growth rate of which was for the first decade and its growth rate had fallen as time progresses from 2.1 % in first decade to 0.5% in fifth decade. Service section was of ascending order from first decade to third decade. The growth rate reached the highest value, 1.3%, in the third decade. From third decade to fifth decade, growth rate of service section had descending order so that it was 1.3% in third decade and reached to the least value, 0.9%, in the fifth decade. During the five decades, variation range of growth rate from the most to the least was agriculture, industry and service, respectively. Average growth rate of economic sections from the most to the least were 1.2, 1.1, 0.9 for agriculture, industry and service, respectively. Third decade was a considerable one because after this decade, all three sections of agriculture, industry and service had continuous descending procedure indicating economic of urban areas was worsening.

2.9 Economic sections growth in rural areas

Number of employees of three sections of agriculture, industry and service has been incorporated shift-share model and growth rate of each section has been obtained (Table 8).

Table 8
Growing of economic sectors GR (A+B+C) in rural areas

Activity	Decade					Mean
	First 1956-1966	Second 1966-1976	Third 1976-1986	Fourth 1986-1996	Fifth 1996-2006	
Agriculture	-0.4	0.0	-0.1	0.1	-0.2	0
Industry	0.5	0.7	-0.3	0.1	0.5	0.5
Service	-0.2	0.2	0.4	1.5	0.4	0.5

Table 8 indicates that in rural areas, growth rate of agriculture section in the first, third and fifth decades was negative with the least growth rate being -0.4 in the first decade. Only in the fourth decade that growth rate of agriculture section was positive (0.1%). With considerable fall in the third decade (-0.3), industry section has not faced with negative growth rate so that the most growth rate is in fourth decade. Growth rate of service section is positive in all decades except for first decade, -0.2%, and the highest growth rate is in the fourth decade. Variation range of growth rate of the three economic sections are 1.7, 0.5, and 0.4 for service, agriculture and industry sections, respectively indicating agriculture section is more changeable and instable than industry and service sections. Average growth rate of three sections are 0, 0.5 and 0.5 % for agriculture, industry and service sections respectively. Average growth rate of agriculture section in rural areas is very worrying. Negative effects of growth rate of 0% in agriculture section are reflected in out-migration of 18443 (Table 5). In rural areas, fourth decade is considerable after which we can see growth fall in all three economic sections and this is worrying.

3. Modeling

After obtaining independent variable (DE) and dependent variable (GR) by labor market model and shift-share model respectively, the two variables were regressed in order to model economic condition of the province ($X=DE$, $Y=GR$). Modeling was performed for rural and urban areas, separately. Census decades in Iran exist only since 1956, so there are only five decades for modeling, which creates a considerable difficulty in process of modeling. The problem is reflected in sig of agriculture section (Table 9). Therefore, there should be care for models of agriculture section and due to few census decades the problem is inevitable.

Models of growth of different economic sections in urban areas

$$\text{GR of agri} = 4.888 - 0.000377 X + 8.44 \times 10^{-9} X^2 - 5.1 \times 10^{-14} X^3 \quad (1)$$

$$\text{GR of indu} = 2.231 - 0.000038 X + 2 \times 10^{-10} X^2 \quad (2)$$

$$\text{GR of serv} = 0.1229 + 0.000087 X - 1.9 \times 10^{-9} X^2 + 1.1 \times 10^{-14} X^3 \quad (3)$$

Models of growth of different economic sections in rural areas

$$\text{GR of agri} = -0.1825 + 0.000006 X \quad (4)$$

$$\text{GR of indu} = -0.2051 + 0.000019 X + 1.5 \times 10^{-9} X^2 - 3.2 \times 10^{-14} X^3 \quad (5)$$

$$\text{GR of serv} = 0.4903 - 0.000012 X - 1.1 \times 10^{-9} X^2 + 4.7 \times 10^{-14} X^3 \quad (6)$$

Table 9
Parameter Estimates

Activity of economic	Urban			Rural		
	Agriculture	Industry	Service	Agriculture	Industry	Service
R ²	0.859	0.855	0.941	0.698	0.926	0.964
Sig	0.5	0.15	0.30	0.8	0.3	0.2
Signification level	50%	85%	70%	30%	70%	80%

3.1. Optimization by GA

After analysis and modeling, models obtained from regression were incorporated GA model and optimization was performed using software MATLAB. The purpose of optimization is to find answer for the question on what employees range should be obtained for each section to reach targeted GR. Because all three sections are affected by each other, so in optimization, urban and rural areas of agriculture, industry and service sections are combined, separately. Average growth rate of each economic section during five decades studied reflects its situation, so average growth rate of each section is considered as optimum growth rate (desired growth rate). The purpose of employing GA is not to obtain accurate optimum DE but to make clearer the economic situation of urban and rural areas. Table 10, indicates DE required reaching desired GR. In optimization, it is tried to make as minimum as possible the difference of average GR of economic sections and GR obtained from genetic algorithm. According to Table 10, in order for agriculture and service sections to reach growth of 1% and industry section to have a growth of 0.8%, 52000 jobs are required in urban areas. Similarly, to reach growth rates of 0, 0.9 and 0.5% for agriculture, industry and service sections, respectively, 31000 jobs will be required. Analyses indicate that economic situation of urban and rural areas are very bad because to reach undesirable growth rate (maximum 1%) DE needs to be increased too much. DE required for rural areas is less than one for urban areas to reach targeted GR, this point does not imply better economic situation of rural areas than urban areas but because targeted GR for rural areas is less than one for urban areas.

Table 10

Change in employment required to achieve the desired GR

Area	Average of GR			GR of desired			required DE to achieve the desired GR
	Service	Industry	Agriculture	Service	Industry	Agriculture	
Urban	1	1	1	1	0.8	1	52403 \approx 52000
Rural	0	0.5	0.5	0	0.9	0.5	31105 \approx 31000

4. Conclusions

1. Considering Ds in five census periods, situation of labor market indicates that urban areas in the first and fifth decades faced with job shortfall but in rural areas, the shortfall was in first, second, third and fifth decades. So rural areas have experienced worse situation than urban areas (Tables 3, 5)
2. Economic situation of urban and rural areas in the fifth decade is much worse than before so that job shortfall merely in this decade has been several times of average job shortfall during five decades. In the decade, job shortfalls in urban and rural areas have been 67000 and 165000 respectively (Table 3 & Table 5).
3. Average out-migration YXM in urban and rural areas have been 1400 and 18000 respectively (Table 3 & Table 5) indicating on the average rural and urban areas have been migrant-senders and out-migration in rural areas is more intense than in urban areas. During the fifth decade, out-migration in urban areas was 13000 and in rural areas, 64000 showing both cities and villages have become migrant-senders (Tables 3 & Table 5).
4. Growth of economic sections has not been so well; in urban areas, average growth rate of three sections of agriculture, industry and service has been 1 and in rural areas are 0, 0.5, and 0.5 respectively. The worrying point is that in spite of too much dependency of rural economy on agriculture section, average growth rate of this section has been 0 (Table 7 and Table 8).
5. Although growth of economic sections in urban areas hasn't been so well, growth of economic sections in urban areas has been better than rural areas (Table 7 and Table 8).

6. In all three sections 52000 jobs in urban areas and 31000 jobs in rural areas are required to reach undesirable growth rate (average growth rate of economic sections in five decades) (Table 10) indicating bad economic condition such as labor market and growth of economic sections in the province.

7. The relationship between economic sections growth GR and employment variation DE indicates that if economic growth is required for regional development, employment should be increased to reach economic growth and in turn investment is required. Therefore, it can be relied on external powers as factors determining regional growth to develop the region where their effects are reflected in expansion of common goods export.

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