DYNAMICS OF NET MIGRATION WITHIN FUNDAMENTAL AND CORPORATE FEATURES: Pakistan's Provincial Study

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Abstract

This study is subject to analyze the dynamics of net-migration for four provinces of Pakistan and integrate an empirical model for net-migration in light of the environmental degradation (Carbon Dioxide is a proxy used for environmental degradation), fundamental features (gross domestic product, square of gross domestic product and percentage of urban population to total population), and corporate features (control of corruption, crime rate and total unemployment), at provincial level of the economy. A panel data approach is incorporated for the period 1976 to 2015; a rank analysis is customized under consideration of fundamental and corporate features for each province. It is found that Punjab and Baluchistan occupy the first and last place, respectively, in ranking with respect to fundamental and corporate features. Higher rank means that province holds a better position with respect to other provinces and vice versa (true for lower ranks); whereas, keeping in view the fundamental and corporate characteristics, Sindh and KPK maintain the second and third place in net-migration scenario. In the province of Sindh these features are in better position but it seems that the province is unable to control migration, which means that some other factors are stronger than the fundamental and corporate features. The empirical analysis have positive and significant influence of fundamental and corporate features to net-migration.

Key words: Environmental Degradation, Carbon Dioxide, Net-Migration, Fundamental, Corporate, Provinces, Panel Data and Pakistan.
JEL Classification: C23, O53, Q53, Q57, R23.

I.   Introduction

Land degradation and pollution of water, air and soil are named as environmental degradation. They are caused due to mishandling of capital, deprived arrangements, poor infrastructure, lack of control and the planning system. Such negligence and misconduct of resources produce pollution and are main source of destruction of ecosystem in all regions of the world. The indicators like change of precipitation patterns, rise in sea-level, and high frequency of heat waves are responsible for climatic change which leads to droughts, hurricanes, floods, and place the population at risk. The increasing

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inertia of the world climatic scenario will continue to change even in the 21st century [Intergovernmental Panel on Climatic Change {(IPCC), (2007)}]. It is also observed that mounting pressure of environmental hazards create a scenario to force individuals to migrate.

The society is benefitted by ecosystems that provide broad range products, such as food, fuel, and fiber. Ecosystems are influenced by a number of direct and indirect factors like climatic change, nutrient pollution, land alteration,and over production, which are directly involved; whereas indirect factors such as demographic, economic, socio-political, scientific, technological, cultural and religious factors are also implicated. The society being a mixture of economic, social and political indicators form a climatic patterns with worst relationship between these two factors and leads to environmental degradation. Land degradation is caused by social problems which can be ignored and addressed through solid measures and effective policies by the authorities [Vlek (2005)].

Causality exists between climatic change and water scarcity which tends to be the burning issue in certain regions of Asian countries, like Pakistan. Due to destruction of fresh water resources there is a shortage of water and population of such areas is eventually forced to be displaced. Their movement creates social and economic pressure not only on themselves but it passes on to neighboring communities as well. Climatic change reports direct loss which represents the loss of financial value of crops and capital assets. The world bears an aggregate loss of more than US$100 billion annually, due to climatic disasters [Stern (2007)]. The capital losses are cause of the following two factors: first, unpredictability (uneven frequency) of environmental change and secondly, strength of weather conditions [Hulme, et al. (1999)].

The highly populated countries like China, India, Pakistan and other Southeast Asian are on the threat of direct capital losses due to floods, earthquakes and droughts; which are caused by environmental changes. Growing figures of tremendously large population are situated in such cities; it means that huge number of citizens may be affected accordingly [Klein and Nicholls (1999)]. The shock of these straight losses of climatic change affects the deprived people. Considerably, in some of the most uncertain regions of the world, augmented loss from climatic disasters may reverse the ability of fiscal growth to lesser the number of people living in poverty. One severe expression of the saddle of climatic disasters will enhance the world-wide relocation flow. The deprived ones get an undue stress of direct damage from environmental disasters as compared to their relative monetary and other overcoming abilities, and climatic change will then be in its worst phase.

People who are affected by climatic change, prefer to opt the domestic migration rather than the international migration in short-run and vice versa in long-run, but in low magnitude. In the current scenario around 230 million individuals cross the international borders but the figure is expected to cross over 400 million by 2050. Due to expected disasters in future, the most helpless individuals would be compelled to move

either to survive in minor first-hit locations or they may have to live in under-standard shelters and become victims of severe poverty. In any environmental set-up, migrants react to structural, corporate and political indicators like fiscal, public, and demographic factors. Relocation takes place in a fixed reaction to climatic shocks, as in the case of compulsory mass departures in response to natural disasters; but it does not mean that migration is only influenced by climatic change as it is also affected by other economic and social variables. A country experiencing diminishing gross domestic product (GDP) will face an extensive out-migration to overcome the rising economic pressure (income effect). Hence, the process may make the environment less enjoyable or more enjoyable [Bilsborrow (l992)].

It is difficult to find that environmental change is the key factor for migration. For rural population migration is one of the numerous recovery possibility to minimize poverty which itself shows a mixture of economic, social and political conditions. It was also concluded that the capability to adjust with environmental shocks is linked with fair allocation of assets since deprived countries are more susceptible than the rich. Kritz (1994) concluded that land deprivation in a farming economy is often related to out-migration in severe climatic occurring, destroying land fertility and making peoples life more miserable, due to the increased gap between rich and poor.

Usually, migration bears economic, emotions, and social cost which can be monetary for moving to new locations; as funds are needed for transportation, lodging, and food. Emotional and public cost include; leaving one's family, relatives, environment and a company of friends. Relocation consumes monetary resources which a family has accumulated for future prospects. This debate makes it clear that many indicators form individual decision to move around. Fiscal situations in both, country of origin and possible destination, change the probability of living at new places. Political conditions are also important at both ends because they have to decide about future prospects of the migrant people. Individuals (both men and women) are expected to shift likely for the period of severe temperature than in the usual days' whereas periods of intense precipitation have modest consequences on possibility for migration. The agricultural income of farmers is badly hit by excessive heat as it destroy their planting area. Most individuals are expected to move to other places at the start of severe high temperature; whereas the deprived are more likely to have domestic migration than the rich. The rich migrate in greater number than the poor.

For international migration, resettlement can also lead to climatic change in destination countries in shape of deforestation and land deprivation due to land use methods of new migrants. An intentional relocation by individuals to a new destination is to acquire higher gains of accessible territory and the resources. This may lead to rapid climatic changes. Countries of origin may get benefits, if remittance are sent by migrants and invested in the development process of environmental conditions. Migrants can be beneficial for destination economy with better use of natural resources, growing new crops and introduction of new production techniques; but however, if they opt for

other options, then they may face worst conditions for the hosting countries. It is estimated by the World Bank that from over US$ 540 billion of remittance (which stream among countries) US$ 400 million flows back to the developing countries. These remittances may be injected by source individuals for development of land, and introducing new farming techniques in direction of more sustainability. A country which experience diminishing gross development product (GDP) will face extensive out-migration to overcome the elevated economic pressure (income effect) or by any other economic factor. This process may turn the environment less enjoyable or more enjoyable [Bilsborrow (l992)].

Population References Bureau conducted a study and concluded that deprivation in a farming economy is often related to out-migration during severe climatic, destroying land fertility and making people more miserable. It is quite obvious that immigrant create some conflict at the destination end because they come from different cultures and experience, different customs and living standards. For these reasons they find difficult to mix-up with the already existing societies. This situation creates conflict between them; for example, the Afghan migrants in Pakistan made law and order situation difficult by leaving their camps for, jobs, to cities/other areas. The nationals are already facing scarcity of employment opportunities, but the Afghans have almost captured the transport business in Karachi. At the political level a clash also takes place in some parts of Pakistan on sharing political powers (specially in Karachi between some communities). India is also facing such problems because of old settlers who fought over the Northeast hills', and even the local people who are in race with new settlers, on employment opportunities [Hazarika (2010)].

1. *Objectives of the Study*

a) To find relationship between environmental degradation and net-migration.
b) To find the impact of fundamental and corporate features on the net-migration.
c) To develop an outline for policy makers to adjust the issue of increasing migration.

2. *Significance of the Study*

This study covers a fifty year period (covering all four provinces of Pakistan), which has not been done earlier with variables used in this study. The literature is rich for net-migration analysis but for rank analysis of other South Asian countries the literature is insufficient.

After the introduction in Section I, Section II presents an evaluation of empirical structure laying in the literature. Empirical model and methodology is presented in Section III, while Section IV explains the data sources and variables. Section V gives the results, and Section VI Conclude the study giving policy implications.

II. Literature Review

From the early years of this century, climatic changes are constantly being investigated to find the social, economic and political impacts. Different strategies have been used to overcome or to mitigate its tendency but still this topic remains unexplained. The researchers are struggling to facilitate or to save the environment from severity of climatic change studying with diverse angles and on different aspects, in various regions and countries. They have found different scenarios for different studies but their results differ from country to country depending on the circumstances at the time of study. The outcome of climatic change is quite different and severe in developing countries rather than then in developed countries. The developing countries found threats of climatic change through floods, land degradation, droughts, food security, health stress on economic factors, etc. For example, climatic change push the economic indicators in worst conditions resulting in unemployment, diminishing of per capita, and existence of underdevelopment [Karemera, et al. (2000)].

Climatic change does not only create some social issues that force people to relocate to overcome the problems that are life threatening and lead to loss of purchasing power [Hirschman (1970)], e.g., land deprivation and its shortage is rising in South East Asia since 1950s. Mostly, these aspects are dependent on agriculture in this region and people are less able to earn their living, Moreover, floods, droughts and land degradation put them in the worst conditions [Schwartz and Reiter (2000)]. There is a fixed tendency of climatic change in any location since it differs from region to region. The degree of precipitation and, the wind and temperature are quite uncertain,. Hence, it involves severe risk to vulnerable individuals [Mitchell and Hulme (1999)].

Since migration is measured as a result of climatic change; and to develop relationship between the climatic change and migration, is not a simple task. There are different direct and indirect approaches to make the situation clear. For example, the direct factor is drought, whereas the indirect cause is famine which are the cause for migration. During a famine period there are many possibilities other than the migration, to cope up with such disasters. [Meze-Hausken (2000)]. It is quite difficult to rank all factors of climatic change that are responsible for migration. The importance of their decision to migrate differs from case to case and individual to individual. Kondylis and Mueller (2014) reports that around 14 million people were forced to displace in Pakistan during a short-run term due to droughts, floods, windstorms (hydro-meteorological), earthquakes and volcanoes (geological). Around 200,000 internally displaced people (IDP) were shifted to camps arrangements and later many of them returned home to rejoin their people. After the climatic shocks individuals returning to their home became victim for migration but others decided to keep their status of internally displaced people.

The fiscal factors, speaks about workers standards of living in their country of origin and their redundancy state as well; if fiscal conditions remained apparently not good and seems to decline further. Most likely, a maximum number of people

will relocate towards better economic regions. Some rural to urban migration also exists on the same pattern but this has no set patterns and it is difficult to measure the degree of their migration due to climatic change [Carletto, et al. (2013)]. Taylor, et al. (2013) conducted a survey to measure the consumption inequality on an average and found that this inequality exists due to wage gap within the rural and urban individuals. Certainly, measuring rural-urban migration, a series of hurdles in wage gap within rural-urban wage gap is found due to variation of skills. The results note that migration may decline from lower income countries to higher income countries as income in developed countries experience a decline in economic growth. Migration towards rich regions shows a tendency to enjoy higher wages, better service conditions and, sometime a wish to flee the internal social and political problems of the country of origin.

Gollin, et al. (2013) examined the collective data of 151 countries to find 'productivity gap' between agricultural, industrial and the tertiary (non-agricultural) of developing countries. They conducted a household survey to find the ratio of average products of labor in the two sectors (a weak indicator of aggregate productivity) and found that this gap is not just an effect of difference in education and number of working hours by the labour force. The flow of such migrants is from middle income countries like Pakistan where, though the educated individuals are increasing but comparatively their wages are lower than the individuals of developed countries. This is the major cause of brain drain in shape of migration of skilled workers from developing countries [Melvin, F.L. (2017)].

Land productivity depends on resemblance of fertility of land at both the origin and destination countries. Migrants get an advantage if they find similar working environment and land conditions at the destination end. [Bazzi, et al. (2014)] examined a study to support this idea and found that if agro-climatic circumstances of migrants' country of origin contests with destination point. then agricultural efficiency is better than where agro-climatic conditions differ. If climatic change force people to move to some other place, their first option would be to migrate within the country. Stern (2007) disclosed that more than 60 million individuals were displaced at risk in South Asia alone in response to vulnerable environment. The gross domestic product is a push factor, both at origin and destination points. Marchiori, et al. (2012) examined the impact of per capita GDP shocks on migration patterns and found that declining GDP work as push factor and increasing GDP also play the role of push factor. Moreover, the authors disagree that increase in rainfall and temperature encourages additional rural-urban migration which works as a nursery for international migration from these urban areas.

The migration patterns in Pakistan are not only influenced by economic factors but some other social and political factors, as well. Like other societies Pakistan is also a victim of some social evils, like corruption, bribery, and other criminal activities both at the public and private sectors at a significant scale. Established corruption di-

minishes the economic opportunities, and make the life difficult for peace loving individuals. Thus, they decide to flee their homeland. Currently, corruption stands as a key push factor for migration; it provide initiatives to individuals to migrate to other destination. Certainly, increased dishonesty correlates openly with a boost in degree for migration from a country. In particular, it is responsible for brain drain of a country where skilled labor is badly needed for country's own economic growth.

During the last two decades the internal migration has taken place specially, from Karachi to Sindh, Punjab and Khyber Pakhtunkhawah (KPK), due to street crimes, kidnapping and ethenic unrest. In addition, some families of Hindu communities migrated, due to religious anxiety in the interior Sindh and some families left Baluchistan on the same grounds; and those who could afford financially migrated to other countries. From the literature on bribery, protection and economic opportunities, an individual suppose that corruption is the key factor for migration; but for further investigation funds should be made available to look at the straight relations between economic opportunities, security issues, corruption, and migration. Although the researchers have paid much attention to investigate the relationship between migration and corruption crime, and unemployment, but it was only found that these factors are highly co-related with each other. Their results also found that no country is facing zero degree corruption, crime and unemployment. Therefore, migrant flow exist from higher degree of polluted countries to countries having lower degree of such impurities. Chetwynd and Spector (2003) also examined that corruption and crime leads to bad governance which is another leading factor for migration.

Another view is that corruption is subject to place a threat on security for citizens as insecure feelings are established for prolonged clash and instability. On the rising degree corruption, many questions are raised on authorities of public institutions; and at the same time corruption deteriorates the establishing process. Nevertheless, even as corruption defines the structure of public institutions in brittle sense, it may be responsible to have hostility due to non-existence of efficient official institutions [Berkelmans, R., and M.J. Van Oppen (2006)]. Extensve literature is available to explain relationship between corruption and crime mafia and the illegal migration. Surprisingly, dishonest law enforcement authorities help criminals for illegal human trafficking. This illegal human trafficking break laws of many borders and let cross the illegal migrants, to their destinations, normally, Europeans. Many migrants even losses their life during this process.

Lapshyna's (2014) focused on the results with outcome of his study which included four countries (Ukraine Turkey, Morocco, and Senegal) and investigated around 2,000 individuals from each country. He found that a pure relationship exist between corruption and out-migration. American Immigration Council disclosed that crime and violence are the key factors that force individuals to migrate from Central America to the United States of America. This shows that increasing violence means increasing inclination towards migration. When law and order situation became worst

in South Africa, migration accelerated towards Europe, North America, the Gulf and Asia, during late 1980. It is therefore apparent that people choose to go out of the reach of violence to have more progress in their life [marie-laurence flahaux (2016)]. It also appears that a boost in unemployment in a destination country is the cause of artificial shock of new arrivals and even minimum wage has no impact over unemployment [Byrne Hughes and Kurdgelashvili (2007)].

In a summative way, Meze-Hausken and Elisabeth (2000), Pankhurst (1988), Kondylis and Mueller (2011) disclosed that environmental degradation is of course, responsible for migration. The researchers like Carletto, et al. (2013) and Taylor, et al. (2013) believed that income inequality is also responsible to enhance net-migration from developing countries. Bazzi, et al. (2014), Stern (2007), and Marchiori, et al. (2012), examined the impact of per capita GDP shocks on migration patterns and evidently found that it acts as a push factor to net-migration. Marie-Laurence Flahaux (2016), and Hughes (2007) argued that net-migration is also influenced by unemployment, crime and worst law and order situation.

III. Empirical Model and Methodology

In order to make the economic and econometric analysis, rank analysis and regression analysis are made, respectively. Rank analysis is made on behalf of the level of net-migration as well, it is a welfare variable.

1. Net-migration Analysis

Keeping in view the level of net-migration, fundamental and corporate indicators - three ranks are constructed. The structure of each rank is explained below. The net-migration describes difference between immigrants and emigrants of an area in a period of time. A positive value shows, more people incoming in a country than leaving from it, whereas a negative value shows, more people leaving a country than coming in it.

2. Net-migration (R-1)

A provincial cross panel data set (1976-2015) is incorporated to find the status of net-migration for the province p at time t, denoted as NM_{pt} by getting mean of the data over time period represented as $\overline{NM}_{pt}$. *R-1* is generated which shows the listing of provinces with respect to time mean net-migration. Hence, *R-1* represents the time mean net-migration of each province of Pakistan. The net-migration is negative, and more negative means more height in rank. The highest provincial rank is represented by the highest level of net-migration which means over a given time period.

3. Fundamental Features and Net-migration (R-2)

To construct the *R-2*, Ordinary Least Square (OLS) method is used,

$$NM_{pt} = \alpha_0 + \sum_{s=1}^{p} \alpha_s\, FF_{pst} + u_{pt} \tag{1}$$

where, NM_{pt} represent the net-migration for province p at time. FF_{pst} is a vector of the fundamental features of type s for province p at time t. More specifically,

$$[NM_{pt}] = [\alpha_0] + [\alpha_1\ \alpha_2\ \alpha_3\ \alpha_4] \begin{bmatrix} LPCO2_{pt} \\ LPGDP_{pt} \\ LPUPPTP_{pt} \\ PCGDPS_{pt} \end{bmatrix} + [u_{pt}] \tag{2}$$

where $LPCO2_{pt}$ describe the logarithmic form of provincial Carbon Dioxide (CO_{2h}) which is a proxy used for environmental degradation, $LPGDP_{pt}$ elucidates the logarithmic form of provincial gross domestic product, $LPUPPTP_{pt}$ explain the logarithmic form of provincial urban population participation percentage to total population and $PCGDPS_{pt}$ state the form of provincial economic shocks. By getting the Equation (2), a residual series u_{pt} is obtained and this explain change in the net-migration, under or over explained by the fundamental features of the provinces. Such residual values speak about the unexplained portion of a province with respect to net-migration.

To expand the *R-2*, the residual values within the province $\bar{u}_p$ are made to explain disparity in the net-migration patterns, which were not described by the fundamental features of the provinces. These residual values expose the potential of a province to minimize the trend for migration. Such time mean figures are important to formulate the relative analysis along with the provinces. Basically *R-2*, well explain the time average residual values of the provinces and consists upon the part, under or over explained for net-migration where the fundamental features FF_{pst} are limited by provinces. Time means that residuals might be positive or negative depending on fundamental features and set values of the province. The positive/negative values imply that province p on average experience Low/High net-migration, at a given fundamental structure (Besley, et al. 2003).

4.   *Corporate Indicators and Net-migration (R-3)*

Some unexplained part of the net-migration for a province p can be explored by the Corporate Indicators with the help of panel regression. More particularly, a regression analysis of corporate Indicators capture the panel residual series u_{pt} as given below:

$$u_{pt} = \beta_0 + \sum_{s=1}^{p} \beta_S CI + v_{pt} \tag{3}$$

where v_{pst} represents the residual series obtained by considering the fundamental features of provinces in equation (3). The CI_{pst} fit in the corporate indicators for province s at time t. More specifically,

$$[u_{pt}] = [\beta_0] + [\beta_1 \ \ \beta_2 \ \ \beta_3] \begin{bmatrix} PCC_{pt} \\ LPCRMR_{pt} \\ LTPUMP_{pt} \end{bmatrix} + [v_{pt}] \qquad (4)$$

where, PCC_{pt} stands for provincial control of corruption which is an effort made by stakeholders of the society including government to get rid of untruthful behavior by an individual through misusing rights, fraud and getting bribe, often to obtain own benefits. The $LPCRMR_{pt}$, represents a logarithmic form of provincial crime means illegal act. The $LTPUMP_{pt}$ stands for logarithmic form of provincial total unemployment.

The residual values obtained from Equation (2) are considered as dependent variable in Equation (4) and corporate vector is considered as independent variables. The depended variable of Equation (4) is the residual value of Equation (2,) where it stands for factors other than the structural variables explaining the behavior of net-migration in individual provinces of Pakistan. Equation (4), customize the impact of corporate features on the factors other than the structural variables. The residual series $\bar{v}_p$, is constructed after regressing Equation (4) which is helpful to construct the R-3. The residual values might be positive or negative. A positive sign predicts that a province is likely to have more immigrants and vice versa for the negative sign. Rank-3 can be constructed by ordering residual values for each province.

In a conclusive sense rank analysis can be expressed as *R-1* which represents the time mean level of net-migration of type *r* for province *s*. *R-2* means the time mean residual values $\bar{u}_{rs}$ that represent the unexplained portion of fundamental features of the provinces. Lowering down in rank-2 means that province is not providing the fundamental strengths to individuals and that is why provinces experience greater outmigration. *R-3* describes the ranking of corporate features of the provinces. Least value of this rank infer that provinces have less ability to control corruption, crimes and unemployment, which initiate individuals to flee from their home land.

IV. Data Sources and Variables

This study incorporate two different types of variables (dependent and independent. Dependent variable is net-migration described as difference between immigrants and emigrants of an area in a given period. A positive value shows more people coming in the country than those who are leaving it; but, a negative value represent that more people are leaving the country than then those who are coming in to the country. The net-migration data was collected from various publications of the Statistical Year Book, Pakistan Economic Survey and Demographic Survey of Pakistan. Independent variables are of two kinds, like fundamental and corporate variables. Fundamental variable consist of provincial Carbon Dioxide which is considered as proxy of environmental degradation, gross domestic product, economic shocks. An economic shock is known as per capita GDP shock and is an incident that indicates a significant change within

TABLE 1

Regional Allocation for Different Sectors/Sub-Sectors

Agriculture		
Major Crops	Share in output of major crops.	PDS, ASYB
Minor Crops	Share in output of minor crops.	PDS, ASYB
Livestock	Share in consumption expenditure.	HIES
Forestry	Share in expenditure on forest products.	HIES
Fishing	Share in output.	PDS, AYSB
Industry		
Mining and Quarrying	Share in output of crude oil, natural gas and coal.	PDS, EYB
Large-Scale Manufacturing	Share in output of 100 industries.	PDS, PESa
Small-Scale Manufacturing	Share in informal sector employment in manufacturing.	LFS
Slaughter	Share in consumption expenditure on live-stock products (excluding milk).	HIES
Electricity, Gas and Water	Shares in electricity generation, electricity consumption, gas consumption and canal water withdrawal.	PDS, EYB, ASYB
Construction	Income-adjusted share in employment.	HIES, LFS
Services		
Transport, Storage and Communications	Shares in consumption of POL and number of cellular phone subscribers.	OCAC, PTA
Wholesale, and Retail Trade, Hotels and Restaurants	Share in trade margins in marketing of goods and in employment in hotels and restaurants.	HIES, LFS
Finance and Insurance	Share in bank advances.	SBP
Ownership of Dwellings	Share in actual and imputed rents.	HIES
Public Administration and Defense	Income-adjusted share in employment.	HIES, LFS
Community, Social and Personal Services	Income-adjusted share in employment.	HIES, LFS

Data was only available for the selected industries. Data of other industries was obtained directly from the Punjab Bureau of Statistics and the Pakistan Bureau of Statistics.

Punjab Development Statistics, ASYB=Agricultural Statistics Year Book, HIES=Household Integrated Economic Survey, LFS=Labor Force Survey, OCAC=Oil Companies Advisory Committee, PTA=Pakistan Telecommunication Authority, SBP=State Bank of Pakistan, EYB=Energy Yearbook.

an economy. Economic shocks are random and characteristically disturb market forces (all over the markets), urban population participation, and its percentage to the total population. Its data is calculated from the Pakistan Economic Survey, whereas corporate variables consist of the control corruption, unemployment and crime rate.

In this study Carbon Dioxide is taken as proxy for environmental degradation. Rachel et al (2015) disclosed that migration of individuals is positively related to energy use and is responsible for emissions of Carbon dioxide; but emission differ from region to region depending on the degree of movement of people. The energy use is responsible for Carbon growth and therefore, it creates bad effects on human living. The World Disaster report 2013 explains that the main drivers like economic, social, demographic, political and environment are responsible for environmental changes. Climatic change is associated with temperature rise and carbon growth, which increases the sea level, soil erosion, pollution and salinity which leads to migration. The data of Carbon Dioxide is collected from provincial year books of agricultural statistics of Pakistan and from the provincial development indicators for the said period.

The data of unemployment is calculated from the Labor force Survey of Pakistan, data of crime rate is taken from the provincial development indicators, and data for control of corruption is taken from the Transparency of Pakistan. A provincial gross domestic shock is calculated by the authors, and the urban population participation to total population data is calculated from the Pakistan Economic Survey. The data of provincial gross domestic product is not available on data sites for Pakistan, but however, it can be calculated manually. In this paper the value of provincial gross domestic product (PGDP) is taken from Bengali and Sadaqat (2005) and Pasha (2015). The methodology adopted by these two can also be seen in literature by Walters (1987) on Australia, Nair (1987) and Tiwari (1971) on India. Provincial gross domestic product is calculated by summing the value addition n by agricultural, services and manufacturing sectors.

V. Results

1. *Existing Net-migration Standards in Pakistan*

For each province the net-migration analysis expresses its pattern in the context of Pakistan. The net-migration took place from 1976 to 2015 and acted as a stock variable. The contrast among provinces is expressed in Table 2 which shows that for the whole Pakistan, they are negative. It means that out-migration is greater than in-migration. On an average, Punjab's net-migration is 0.237 million, it is 0.099 million for Sindh, 0.057 million for KPK and 0.037 million for Baluchistan.

Punjab experience higher net-migration than Sindh, KPK and Baluchistan, which are listed at second, third and fourth position, respectively. Figure 1 explains patterns of the net-migration of Pakistan.

TABLE 2

Provincial Net-migration of Pakistan

Provinces	Net-migration (Millions)
Punjab	-0.2373
Sindh	-0.0992
KPK	-0.0578
Baluchistan	-0.0371
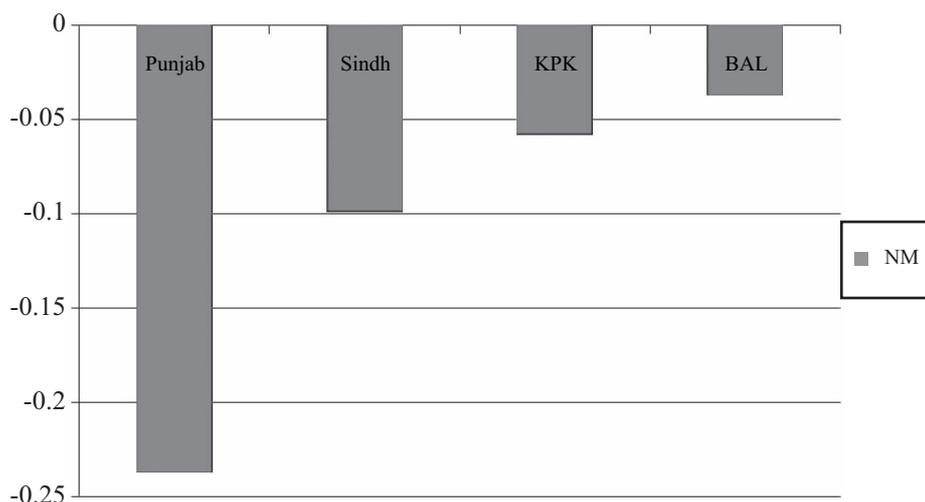
Source: Author's Estimation.

FIGURE 1

Net-Migration at Province Level

The dynamics of net-migration can be explained with the help of fundamental and corporate indicators of the respective provinces; these explain the strength of such indicators and its impact over net-migration. A rank analysis is established with the help of fundamental and corporate framework within these four provinces.

2. *Provincial Ranking and Net-migration*

A rank analysis is adopted to explain the ranking system with consideration of fundamental and corporate features. Three ranks (*R-1*, *R-2* and *R-3*) have been developed in Table 3. Outcome of *R-1* specify that for net-migration Punjab and Baluchistan hold the highest and lowest positions, respectively. Both these provinces maintain the

TABLE 3

Provincial Ranking

Provinces	R-1	R-2	R-3
Punjab	1	3	3
Sindh	2	2	1
KPK	3	1	2
Baluchistan	4	4	4

third position in *R-2* and *R-3* for fundamental and corporate indicators. On the other hand Sindh holds the second position in *R-1* and maintains it in *R-2* as well, but loses its place in *R-3*. This shows that Sindh has a reasonable standing for fundamental and highest corporate indicators in comparative manner. KPK is better off in *R-2* and *R-3* which explains that it has reasonable fundamental and corporate indicators to express the net-migration scenario. In the panel data model there are two dimensions: the time and cross-section. The error term of fixed effect model shows the unexplained part with respect to the both components. However, the error term cannot be segregated for the two dimensions.

In view of the net-migration, Punjab holds the highest position in *R-1*; Baluchistan holds the lowest position in ranks because of low fundamental and corporate indicators. In rank assessment Baluchistan is not as good as the other provinces, with respect to the fundamental and corporate indicators. KPK is at the third place because its fundamental qualities are at highest place and its corporate indicators are second best within as compared to other provinces. That is why the KPK has least inclination towards migration. Sindh is comparatively good in fundamental and corporate indicators but its migration flow is second among the provinces. This shows that some other political or ethnic issues force the people of Sindh to migrate.

3. *Descriptive Analysis*

The correlation between all independent variable is less than 50 per cent and can be incorporated in a model.

TABLE 4

Descriptive Analysis

	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
LCO2	0.16726	0.11943	0.547	0.01659	0.14638	160
LUPPTP	1.42165	1.44526	1.72779	0.97955	0.20054	160
LGDP	1.94232	1.92999	2.86919	0.98637	0.44295	160
GDPSHOCK	0.0382	0.1267	0.29759	-0.654	0.23474	160

Note: The mean of LCO2 is 0.167258, LUPPTP is 1.421646, LGDP is 1.942319 and GDPSHOCK is 0.038196.

TABLE 5

Correlation Analysis

	NM	LCO2	LUPPTP	LGDP	GDPSHOCK
NM	1				
LCO2	-0.6164	1			
LUPPTP	-0.2896	0.46723	1		
LGDP	-0.5182	0.49091	0.55066	1	
GDPSHOCK	0.74768	0.26815	0.3902	0.34728	1

4. *Regression Analysis*

a) *Net-migration Regression Analysis Using Fundamental Indicators*

Table 6 shows the results obtained from Equation (2) that make Rank 2. Such results are useful for policy building of fundamental indicators of the provinces whereas, the fundamental feature are vital to determine the net-migration characteristics. It is examined that provincial log of per capita GDP is significant and negative in relationship with the net-migration. This show that with the increase of GDP net-migration will decrease because increase in gross domestic product provide more economic opportunities to individuals, making them less inclined and least interested to migrate.

The dependent variable for fundamental indicators is net-migration, and for corporate indicators it is the residual value (factors other than fundamental features) obtained from the regression analysis which is between net-migration and the fundamental indicators. In case of each province of Pakistan, net-migration is negative and the result of provincial CO_2 is positive and significant; it means that provincial net-migration is more negative and least people are interested to migrate in any of the province of Pakistan. Log of provincial gross domestic product is negative and significant, which means that increase in provincial GDP will boost the trust of individuals on their respective domestic economies and the results out migration will be discouraged. Log of per capita GDP shock, express positive and significant affiliation with net-migration. It means that economic shocks are negative and prove worst for individuals and they will find difficult to earn their living in the existing scenario; thus. they will decide to migrate. The share of urban population play a significant and positive role for determination of net-migration patterns because increasing urban population increase the population density of cities that shrink the job opportunities for them. It also increases the political unrest and bad law and order situations in the existing locations and that is why they decide to migrate. Corporate features are regressed on residuals (other factors) which are positive and significant. It means that these factors behave positively on net-migration and count as less negative.

b)   Net-migration Regression Analysis using Corporate Indicators

The results for corporate indicators of the provinces are shown in Table 6, and Equation (4) show the unemployment positive and significant impact on net-migration. Thus, it is evident that increasing unemployment push people to migrate so that they can earn and improve their living standards.

Hypothetically, a straight bond exists between the provincial crime rate and migration. It is expected that more individuals will flee from a country that has increasing crime rate, but Table 6 show the contradictory and significant results. Therefore, it is concluded that when crime increases then out-migration increases. This concludes that in provincial crime rate is not the source of migration or if crime is less in number it hardly pursue people to flee their homeland. However the control of corruption shows

TABLE 6

Regression Analysis

Variables	OLS	
	Fundamental Qualities	Corporate Indicators
	1	2
LPCO2	4.978	
	(17.357)*	
LPGDP	-0.334	
	-(3.304)*	
LPCGDPS	1.302	
	(14.612)*	
LPUPPTP	0.364	
	(3.382)*	
PCC		2.56E-07
		-0.4483
PCRMR		3.09E-07
		(6.447)*
LPTUMP		0.364
		(3.382)*
CONSTANT	1.244	0.35919
	(8.074)*	(6.61659)*
R2	0.911	0.59
F-Stat	514.426	72
F-Stat Prob.	0	0
DW-Stat	0.229	0.314
Obs.	200	200

Source: Authors' Estimation. * significant value at 1%.

a positive but insignificant result on the net-migration which means that control of corruption is helpful to minimize the out migration, but it is insignificant.

VI. Conclusion and Policy Implications

This paper attempts to made efforts to analyze the dynamics of net-migration for all the four provinces of Pakistan. In this study, push factors are considered to investigate the provincial net-migration scenarios of Pakistan. These push factors are further divided into two categories: the fundamental features and the corporate features; beside the environmental variables. To present findings of this study, results are examined into two ways: a rank analysis and regression analysis. To construct rank analysis, the technique incorporated by Besley (2013) was used. Rank-1 is constructed by ranking net-migration values of each province of Pakistan and then Rank-2 is constructed by rearranging the residual values obtained from regression analysis between fundamental features and net-migration. Rank-3 is introduced by rearranging the residuals values obtained from regression analysis between corporate features and the residuals of Rank-2 as dependent variable.

The rank analysis describe that most of the people are migrating from Punjab and least from Baluchistan. These two provinces hold third and fourth position in Rank-2 and Rank-3 with respect to fundamental (structural) and corporate (institutional) features. Therefore, it cannot be predicted that poor condition of structural and institutional features is responsible for migration because these two features hold the least magnitude in Baluchistan and less number of people migrate from this province. The empirical analysis disclosed that fundamental features are stronger than the corporate features with respect to net-migration. Environmental degradation is responsible for migration; where as positive economic shocks, increase in gross domestic product and control over corruption discourage people to migrate.

Comprehensively, it can be concluded that provinces have to improve their economic indicators to boost structural or fundamental features at the province level; including provincial per capita gross domestic product, employment opportunities and infrastructure of all kinds. Similarly, provinces have to improve their respective corporate or governess indicators including control over corruption, living standard and the crime rate, to strengthen the economic situation. If provinces improve their structural and corporate features then people will hardly think to migrate.

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