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RELATIVE ATTRACTION OF CITIES AND INTER-CITY MIGRATION – AN ANALYSIS USING THE GRAVITY SETUP[3]

The study provides both descriptive as well as regression analysis explaining the relative dominance of one city (urban area) over another to attract migrants from other cities. The empirical analysis reveals that the relative size of the informal sector in a city and the magnitude of the flow of foreign direct investment towards these cities foster in-migration. Empirical assessment is based on two estimation techniques, the Generalised Method of Moments (GMM) and Tobit regression analysis. The techniques examine migration patterns across 14 major cities focusing over a time period of 7 years (2005-2006 to 2012-2013). It is found that the labour market variables (expected wages, employment, and unemployment rate) and regional economic contribution have a strong significant influence on inter-city migration flows. Distance, as suggested by the gravity model, and years of education, reflecting human capital, have a significant positive impact on migration flows across urban-urban (cities) regions. Further positive and negative amenities attached to the region significantly influence migration flows towards these areas, supporting theories of location. Migration is an equilibrating response to existing disparities and disequilibrium among regions and across cities. The concentration of economic activities generates employment opportunities, which are a strong driver of migration and development of the region. The study proposed that the government should opt for horizontal urbanisation rather than vertical urbanisation pattern. Hence, if the government wants to target the development of various regions, it should divert economic activities towards the targeted region and cities.
Keywords: Urban-urban migration; Pakistan; Location amenities; Type of cities; Tobit
JEL: J61; J68; R12

1. Introduction

It is in human's very nature that they keep seeking for more and more. They keep improving from a relatively low standard of living to a relatively better standard of living. If the natives are faced with unemployment, or if employed, they are not satisfied with what they earn or

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with their standard of living, they seek places, offering what they felt deprived of at their current location. While on the other side of the coin, factors such as rapid economic growth, charm of better employment opportunities and physically attractive regions, such as regions with better recreational activities, high rises etc., pull individuals to move in. It is also apparent from the rapid pace of urbanisation, which is dominantly contributed from migration rather than from natural population increase, as the rate of natural population growth is declining in Pakistan. In Pakistan number of migrants is increasing year by year and so does the interests of researchers in analysing it. Though most, not all, of the existing research bore the country-level analysis. When it comes to migration in our country, the literature is found to focus on migrants and their characteristics rather than focusing on the characteristics of locations that attract migrants. This seeks answers to questions like why migrants rush towards some specific locations, what one location offers in relation to other locations, rural-urban migration is well defined, but what defines urban-urban migration, why one urban area is preferred over the other etc. This is the grey area in Pakistan's migration literature and this research is designed to explore the same area to the best it could.

People migrate from one place to another because of three major reasons Socio-Economic, Cultural and Environmental. Each of them can be analysed using Push and Pull Factor Analysis. The Push Factor is a reason or condition that drives out individuals from their current location, while a Pull Factor is the one that attracts them to move to a particular area. The table below summarises some of the push and pull factors under each head.

Table 1

Factors affecting migration

Factors Influencing Migration		
Reason		
	Factors	**Factors**
Socio-Economic	→ Relatively low income → Unemployment → Land shortage → Negative Amenities → Demographics → State policies	→ Industrial growth → Employment → Investment → Positive Amenities → Demographics → Social Network → State policies
Cultural	→ Political instability → Ethnic clashes	→ State policies → Mega socio-cultural opportunities
Environmental	→ High risk of natural disasters → Extreme climates → Pollution	→ Low risk of natural disasters → Physically attractive regions

Source: Author's presentation of migration reasons and the push-pull factors attached to them.

The difference between per capita income or wage level across regions is a significant variable for explaining migration. Expected wages that account for the probability of attaining employment in the destination is relatively a better major for explaining migration patterns as per Haris and Todaro (1970) & Barnum and Sabot (1977). The attraction of high wages attracts both skilled and unskilled labours (Glickman, McHone, 1977). More and better employment opportunities at a location, either in the formal or informal sector, raise in-migration to that location (Pissarides and Wadsworth, 1989). Apart from wage and employment, other attributes of destination such as education, health, social and recreational opportunities also foster rural-urban migration as well as urban-urban migration. Cities relatively richer in these attributes and contributing more to the economic growth of the nation attracts migrants not only from the traditional sector but also from relatively less urbanised sector following maximisation behaviour (Henderson, 1974).

Distance to and contacts in host location are also very important in deciding where to move for migrants (Schwartz, 1973). Distance deters migration as it has both economic and social costs. A larger distance means high commuting costs, not only between origin and destination. This higher commuting cost limits the frequency and ease for visiting back home, thus putting a social cost on migrants as well. However, negative distance consideration, commuting and moving cost, fades out as an individual's job earnings increases or means of transportation gets improve. As per Ravensten (1885), the second law of migration is *"**The facilities of communication may frequently countervail the disadvantages of distance**"*. Yap (1977) indicated that people are more migratory towards areas where they have their friends and family, linguistic, cultural or ethnic majority (Huntington, 1974) and earlier migrants from the same location they belong (Alpay et al., 2008). Despite of the social attachment, contacts in the destination are a source of information regarding socio-economic opportunities (employment, housing, wages etc.) at the destination for the ready-to-migrate individuals at origin (Greenwood, 1972, 1971).

Migration increases city size both physically and economically. The physical definition of city size incorporates population as greater land area is needed to accommodate it while economic size incorporates economic contribution by city. Domestic and foreign investment in a particular area increases the city size by increasing job opportunities resulting in increased labour demand and higher wages that foster migration flows towards that city from rural areas as well as other cities (Lowry, 1966).

Developing countries lack funds to follow a balance growth strategy. Hence, they follow an imbalance growth strategy[4] (Hirschman, 1988) and invest in some specific regions rather than in all. Usually, policies of developing countries are biased towards industrialisation or urbanisation for rapid economic growth. Thus, create inequalities between rural and urban areas, which provoke rural-urban migration. While the pace of growth and urbanisation in different urban areas majorly effects inter-urban migration (Cole, Sanders, 1985; Etzo, 2008; Andrienko, Guriev, 2003). This frames the base for this research. The aim of this research is to seek answers to what induces labour migration from one urban area towards another, rather

[4] Unbalanced growth theory: This theory stresses on the need of investment in strategic sector of the economy instead of all the sectors simultaneously According to this theory the other sectors would automatically develop themselves through what is known as "linkages effect".

from rural to urban that is common in literature, in the light of relationships discussed above. The analysis is based on descriptive as well as empirical investigation using a micro-penal data set comprising of 14 major cities in Pakistan defined by the Labour Force Survey (LFS) for the period 2005-2006 to 2012-2013. The rest of the paper is organised to present a review of existing theoretical and empirical literature in the next section, followed by the framework of the study, empirical analysis involving both descriptive and regression outcomes, conclusion and policy recommendations.

2. Review of Literature

2.1. Theoretical Literature

The regional labour market clearing process is based either on the adjustment of labour demand that depends on regional capital endowments or on the adjustment in labour supply that depends on the mobility of labour. The neo-classical remedy for adjustment of labour demand is based on wage flexibility. In the absence of any external factor, the theory suggests that a decline in wages increase labour demand. In contrast, Keynes (effect) argue that consumption is largely a function of local wages and if it is tackled by a wage decline, its effect would be a negative income effect on aggregate demand. Further, because of the multiplier impact of this negative effect, involuntary unemployment will be generated. In neo-classical approach Pigou effect[5] dominate Keynesian effect while in Keynesian approach Keynes effect will dominate.

An alternative mechanism to bring the regional labour market to equilibrium is by allowing the regional supplies of labour to adjust that depend on migration behaviour, which this research aims to deal with. In literature, we have various theories and models discussing these supply considerations to bring equilibrium in the regional labour market via inter-regional migration behaviour. In general, these inter-regional migration models and theories are classified depending on whether the wage is a key determinant of migration. Theories and models taking wages as a key factor defining migration falls under the head of wage models while those that don't belong to non-wage models. The basic underpinning behind migration is either disparity across regions or the urge for better and secure living that provides an incentive to migrate for individuals from one place to another.

As per Lewis (1954) in McCatty (2004), it is because of the difference in wages between the traditional and the industrial or modern sector that provides an incentive for individuals to move from the former to the latter sector. Lewis (1954)'s traditional sector can be agricultural, rural or any sector that is relatively less developed technologically or infra-structurally from the modern, industrial or urban sector (Ray, 2009). The classical approach explains labour migration by emphasising on actual wage differential, but Harris-Todero (1970), in their rural-urban migration model, emphasised on the expected wage differential between the rural and urban sectors. In Todero's own words,

[5] Pigou Effect: The willingness of firm to increase employment in response to decline in wage rate.

> *"The theory assumes that members of the labour force, both actual and potential, compare their expected incomes for a given time period in the urban sector (the difference between returns and costs of migration) with prevailing average rural incomes and migrate if the former exceeds the latter."*
>
> *(Economic Development, 8th edition)*

According to Harris-Todero (1970), along with the relatively high urban wages, the probability of obtaining employment in the urban sector will motivate migration even in the presence of urban unemployment. Other wage models or theories in literature considers equalisation of amenity[6]-adjusted wages for bringing inter-regional labour market to equilibrium rather simple wages or expected wages. Amenity-adjusted wages are the wages adjusted for the bundle of amenity goods to be consumed at a certain location or region. These location amenities differ across the region and can be positive or negative. Positive amenities provide utility while the negative cause disutility. Thus, the former attracts while the latter repels in-migration to a region. Wages, other than being a reward for labour services in production, are also perceived to be partial compensation for the amenity differences between regions. For a given level of utility, migrants can trade-off between wages and the amenities offered in different regions. Individuals may be willing to accept low (high) wages in a high (low) amenity area to be at a certain utility level. Thus, the decision to migrate will rely on the inter-regional amenity-adjusted wage differentials though inter-regional wages may be in equilibrium. Moreover, Sjaastad (1962) introduced a human-capital framework for explaining migration that was further discussed widely by Becker (1962). The basic idea behind this theory is that the more an individual invest in attaining human capital (education, training etc.) or in staying in regions with high average years of schooling (an indicator for human capital in a region) would increase their productivity and efficiency through knowledge spillover effects. This yields higher wages for them as they become more competent. Hence, in order to enhance their productivity and efficiency, individuals are more likely to migrate towards areas enriched with such knowledge of spillover effects. Thus, asymmetries in location and individuals also effect migration decisions, Bunea (2012).

Non-wage models suggest that migration will take place even though wages or expected wages, or amenity-adjusted wages, are in equilibrium. The gravity model of migration suggests that the level of migration between two regions are directly associated with the population sizes of the area and inversely related to the distance between the two regions. The distance deterrence argument implies that the likelihood of migration between any two locations will be inversely related to the distance between them because as distance increases, the economic cost and risk associated with migration increases as well.

2.2. Empirical literature

It was Ravenstein (1885) who came up with the laws of migration at first. He analysed 1881 UK census data descriptively and stated that migration is inversely proportional to distance

[6] An **amenity** is a desirable or useful feature or facility of a building or place.

and hazardous conditions while directly proportional to prosperous economic and environmental conditions.

Zhang and Shunfeng (2003) performed an empirical analysis using China's data for the year 1998 of 28 provinces, concluded that the urban-rural income gap was a significant factor in defining intra- and interprovincial migration. Distance tends to deter inter-provincial migration. Further unilateral causality flowing from rapid economic growth to migration using a data set from 1978 to 1999 was also found. Implementing a generalised gravity model Li (2004) also analysed China's two data sets, 1985-1990 and 1990-1995, showed that in comparison with migration from urban areas population pressure, lack of cultivated land and distance was more a push factor for migration from rural areas. GDP per capita was contradicting and was found to be positively related to urban migration. The urban unemployment rate was insignificant. Average wages were significant statistically with correct signs in all cases.

In the Netherland, internal and international migration flows were compared descriptively using 1997 data for four megacities, the capital Amsterdam, Rotterdam, Hogue and Utrecht. The research revealed these cities were well-hosting immigrants from across the national border, while as far as internal migration is concerned, they had a negative net balance that is individuals were moving out of these megacities to got settle in the adjacent areas (Van Huis et al., 2004). Alpay et al. (2008) also conducted research, using Turkish provincial data from the 1990 and 2000 census implying an extended gravity model for analysing gross migration flows from origins to destinations. Real GDP, Population, Unemployment rate, Youth share in total population, Average year of schooling, No of migrants prior to the period of analysis and cost of travelling in the province of destination and origin were all significant at 1 per cent significance level in explaining migration along with having the expected signs. Further, Ozmucur and Silber (2002) also highlighted the significance of spatial inequalities on turkey's internal migration, while Peeters (2012) emphasised the importance of gravity and spatial structure in the context of inter-state migration in Mexico.

3. Methodological Design

The methodological design adopted in this research for the empirical analysis includes descriptive as well as regression analysis. The descriptive analysis involves an examination of relationships in terms of data presented in tabular form, while the regression analysis determines the inferential strength and magnitude of the factors explaining urban-urban migration along with the relationship of these factors with the dependent variable.

3.1. Descriptive Analysis

The main contribution of this research is analysing the attractiveness and the relative attractiveness of urban areas in stimulating migration from one urban area to another urban area. For this, a detailed descriptive analysis is performed. To understand the individual city dynamics, various characteristics of a city are considered, which includes inter- and intracity

migration flows, economic participation of cities, employment opportunities, positive and negative amenities that each city holds.

3.2. Regression Analysis

This research targets the difference in one urban area from another in order to define migration across urban areas. The purpose is served by taking differenced variables representing city characteristics and analyse their impact on city-wise net migration for the major 14 cities in Pakistan over a period of 7 years using the gravity model. Net migration is the difference between out-migration (emigrants) end in-migration (immigrants). All variables in this regression model are used in difference form (destination value – origin value) so as to represent the gap between destinations and origins for a given variable. This means the greater the gap, for example, in the unemployment rate between destination and origin, the lesser is the resultant net migration because immigration is then expected to decline while emigration is expected to increase. Similarly, if the gap increases for positive urban amenity indicator, there will be more immigration and less emigration expectedly.

3.2.1. The Model

The econometric model for estimation is as follows

$$NM_{ijt} = \propto +\beta_1 D\_EW_{ijt} + \beta_2 D\_UER_{ijt} + \beta_3 D\_IFS_{ijt} + \beta_1 D\_EMP_{ijt-1} + \rho_1 D\_DR_{iJt} + \varphi_1 D_{ijt} + \gamma_1 D\_CEC_{Ijt} + \gamma_2 D\_UI_{ijt}^{+} + \gamma_3 NM_{ijt-1} + \gamma_4 D\_HC_{ijt} + \gamma_5 D\_FDI_{ijt} + \gamma_6 D_{UI_{ijt}^{-}} + \mu_{ijt} \quad (1)$$

Where,

i, j and *t* represent origin, destination and time, respectively;
NM_{ijt} = Net migration from origin city (i) to destination city (j) at time (t);
D_EW_{ijt} = difference of expected wages between cities (ji) at t;
D_UER_{ijt} = Differenced unemployment rate prevailing between cities (ji) at t;
D_IFS_{ijt} = difference of informal sectors own by city j and city i at t;
D_EMP_{ijt-1} = Lagged differenced of employment between cities (ji) at t;
D_DR_{iJt} = Differenced dependency ratio between cities (ji);
D_{ijt} = distance between cities (ji);
D_CEC_{ijt} = difference between economic contributions made by cities (ji) measured in terms of their real gross domestic product;
$D\_UI_{ijt}^{+}$ = difference between positive urban amenities of cities (ji);
$D\_UI_{ijt}^{-}$ = difference between negative urban amenities of cities (ji);
D_HC_{ijt} = Differenced years of education, attainment between cities (ji);
D_FDI_{ijt} = Differenced foreign direct investment inflows between cities (ji);
NM_{ijt-1} = Lagged net migration between cities;
μ_{ijt} = residuals from the regression model.

3.2.2. Variables and Data Sources

The analysis in this research demands data for all the variables in the model at city level, which in itself is quite challenging to gather, especially for the cities in Pakistan. The data set is compiled using various data sources and their various issues. Some variables are constructed using the published data sources while the others are extracted from micro-panel database, i.e. Labour Force Survey (LFS), by aggregating the data at a city level.

Migration is taken as the number of migrants in the region, excluding the non-migrant children of the migrated families. Net migrants to one city from another are immigrants fewer emigrants in that city from a particular city. Expected wages are defined as real wages times the probability of attaining employment at a destination following Harris-Todaro's definition. City-wise consumer price indices, obtained from an inflation monitor published by the State Bank of Pakistan, are used to make city-wise wages real. The dependency ratio is equal to the ratio of dependent population (population minus employed population) to employed population. Employment, years of schooling, informal sector and the unemployment rate were extracted from LFS as well.

For foreign direct investment in the cities, a proxy is used to reflect investment by foreign sources in intermediaries and telecommunication, which constitutes a substantial portion of FDI inflows (Nazeer, Tabassum, Alam, 2017). The data for this variable is gathered from the Banking Statistic of Pakistan and Pakistan Telecommunication Authority. Cities economic contributions are calculated using a top-down technique from the sector-wise national gross domestic product, published in Pakistan Statistical Yearbook. Urban amenity indices are calculated using Education Statistics of Pakistan and Development Statistics of Sindh, Punjab, KPK and Baluchistan. The variables, used for the positive urban amenity index include the provision of education and health by the individual city as well as domestic financial institutions there. While for negative amenity index, congestion and reported crimes are used. Finally, the data for the distance between one city to the remaining cities is obtained from the internet.[7]

3.2.3. Econometric Techniques

As the dependent variable in the above regression model is net migration, it may take a value equal to or less than zero. Positive values of net migration reflect more immigrants than emigrants; its negative values mean fewer immigrants than emigrants and its zero value indicates that either no one migrates from or migrates in city **i** from a particular city **j**. Or there is an exact number of immigrants and emigrants which on differencing yields zero net migration. Having values ≤ 0 limits the log transformation and makes the estimation biased. To tackle these two techniques are applied.

First is the use of Tobit regression for such censored data. The Tobit model, also called a censored regression model, is attributable to Tobins (1958)'s work. It is applied when the

[7] http://distancecalculator.globefeed.com/pakistan_distance_calculator.asp.

data is censored by some criteria**.** It is estimated on the basis that endogenous variable is censored at some value.

Consider a latent relationship, between x and y, of the form

$$y_i' = x_i'\beta + u_i, \;\; u_i \sim N(0, \sigma^2) \tag{2}$$

Where y_i is the dependent variable, xi represents independent variables, β are slope coefficients, and u is the independently distributed error term following a normal distribution with mean 0 and constant variance (σ^2).

The observability rules for a censored variable are

Rule: 1 $\quad y = y_i'.1(y' > c) + c\ 1(y' \leq c)$

Rule: 2 $\quad y = y_i'.1(y' < d) + d\ 1(y' \geq d)$

Rule: 3 $\quad y = y_i'.1(c < y' < d) + c\ 1(y' \leq c) + d\ 1(y' \geq d)$

Rule 1 is the case when the dependent variable (y) is censored at and below a limit c, rule 2 is the one when it is censored at and above a threshold d while rule 3 depicts the possibility that the data is censored from both ends, at and below the limit c and at and above the limit d at the same time. Depending on the characteristics of the regresand considered in urban-urban regression, the observability criterion followed is:

$$y_i = y_i'.1(y_i' > 0) \tag{3}$$

The probability of observing censored and non-censored observation can be calculated as,

$$\Pr(y_i = 0|xi) = 1 - \Phi(x_i^*\beta/\sigma) \tag{4}$$

$$\Pr(y_i > 0|x_i) = \Phi(x_i^*\beta/\sigma) \tag{5}$$

From the Tobit specification with censoring from below at zero, we can derive the expected value of the observed dependent variable y_i as

$$E(y_i \mid x_i) = \Pr(y_i > 0/x_i).E(y_i \mid x_i > 0) \tag{6}$$

That is, the expected value of all observation, Ey, is equal to the product of the probability of being above the limit, $\Pr(y_i > 0/x_i)$ = F(z), and the expected value is conditional upon being above the limit.

Marginal effects for latent, censored and uncensored expected values can be obtained by taking the partial differential of equation 6 (Mcdonald, Moffitt, 1980). The marginal effect on the latent variable is given by

$$\frac{\partial E(y_i)}{\partial x_i} = \beta \tag{7}$$

Considering the effect of change in independent variable on the expected value of observed dependent variables for the whole sample, the marginal effect conditional on censoring is expressed as the product of the marginal effect of the latent variable multiplied by the probability of being above the limit. Symbolically,

$$\frac{\partial E(y_i \mid x_i)}{\partial x_i} = \beta \,.\, \Phi(x_i^* \, \beta / \, \sigma) \tag{8}$$

Finally, the marginal effect of change in some independent variables on non-censored dependent variables is

$$\frac{\partial E(y_i \mid x_i, y_i > 0)}{\partial x_i} = \beta \, (\, 1 - \, \frac{\partial E(y_i \mid x_i)}{\partial x_i}) \tag{9}$$

Apart from the Tobit analysis, a statistical concept is also applied to deal with the censored dependent variable. A constant greater than the minimum of the dependent variable series (C > min. NM) is added to the dependent series (NM+C) just to make it greater than zero (NM>0), and then GMM estimation is carried out following Arellano-Bover / Blundell-Bond (1998) linear dynamic panel-data approach. The approach is designed especially to account for a panel with time (t) less than cross-sectional units (n). Arellano-Bover / Blundell-Bond (1998)'s methodology is more feasible, than the one presented by Arellano-Bond in 1991, because of an additional assumption that the first differences of instrument variables are uncorrelated with the fixed effects that allow the introduction of more instruments and increase efficiency. The results from the two techniques are then compared. The consistency of the GMM estimator depends on the validity of the moment conditions and this can be tested using two specification tests: the Hansen test is a test of the overidentifying restrictions and the joint null hypothesis is that the instruments are valid, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation; and the Arellano-Bond test for no second-order serial correlation in the error term (Baltagi, 2005).

4. Descriptive Results

As per descriptive scrutiny of the fact, about 41% of the total migrants rushed towards major fourteen cities who only occupy 11% of the total region in Pakistan as per the labour force survey (LFS) on average. 20% of the regions attract 15% of the total migrants and 69% of the regions are successful in grabbing 44% of total migrants.

Table 2

In-migration by destination regions

In-Migration by Destination Region					
S. No.	Area	Average		2012-13	
		Migrants	In %	Migrants	In %
1	Major cities	5273353	40.90	4396405	36.41
2	Other Urban areas	1991578	15.45	2005063	16.60
3	Rural areas	5627671	43.65	5674621	46.99
	Total	12892603	100.00	12076089	100.00

Source: Author's Tabulation.

It would be interesting to know the characteristics of these 11 % regions, the fourteen major cities that caught a bigger chunk of the migrant pie. Urban migration is different from simple

migration as it takes into account the geography of the region's location and its location-specific features.

4.1. Migration and Economic City Size

The size of a city plays an important role in defining the in-migration of a city. The size of a city is usually measured in terms of real GDP produced by a city. Cities with relatively greater economic size tend to experience more in-migration.

Table 3

Migration, Real GDP and type of cities

Migration, Real GDP And Type Of City Averaged For 7 Years		
Cities	Migration	Real GDP
	Count	Rs In Million
Lahore	1057704	299734.4
Faisalabad	359138	120765.2
Rawalpindi	394077	76714.6
Multan	130691	59055.4
Gujranwala	194122	61772.4
Sargodha	31901	18963.6
Sialkot	40765	17304.1
Bahawalpur	77140	30877.3
Islamabad	276048	24256.7
Karachi	2234148	516157.4
Hyderabad	138566	63095.6
Sukkur	32936	19416.7
Peshawar	250670	55345.9
Quetta	27356	25731.2

Source: Author's Tabulation.

The above tabulation shows that Karachi has the largest share in income among cities and thus hosts the largest number of migrants among cities also, followed by Lahore and others. The relatively greater share of a city in gross domestic product reflects relatively greater production and employment opportunities in them. Thus, attracting more migration towards them.

4.2. Size of informal sector and In-Migration

Migration and the size of the informal sector are positively linked to one another. The existence of a large informal sector is a strong driver for attracting unskilled labour migration especially. Informal sector and migration flows in major cities are tabulated below, sorted in ascending order with respect to the size of the informal sector, held by the cities on average.

Cities with enlarged informal sector encounter more migration inflows. Karachi has the largest informal sector employment and hosts the highest number of migrants as well. In-

migration is highest in Lahore after Karachi and so does its informal sector. Islamabad has the smallest informal sector. Islamabad is the capital city of Pakistan. It is home to ministries and major government headquarters. Thus, the city is more documented (formal economy). Migrants reaching Islamabad are mostly the skilled ones and for them, the informal sector matters less.

Table 4

Size of informal sector and in-migration in major cities of Pakistan

Informal sector and In-migration		
Name	Average City-wise	
	In Migration	Informal Sector
Karachi	2234148	1541552
Lahore	1057704	1096897
Faisalabad	359138	471303
Gujranwala	194122	266756
Rawalpindi	394077	261200
Multan	130691	248558
Hyderabad	138566	207513
Peshawar	250670	188376
Bhawalpur	77140	90084
Sargodha	31901	74581
Quetta	27356	68937
Sialkot	40765	68054
Sukkur	32936	66733
Islamabad	276048	61692

Source: Author's Tabulation.

4.3. Urban amenities influencing migration

Urban amenities play an important role in grabbing migrants from various destinations. Positive amenities such as financial intermediaries, education, health and recreational opportunities tend to increase in-migration. While, the view from the other side of the mirror, negative area amenities like crime rate and congestion are repulsive in nature. It is more economical and viable for the public and private sector both to incur overheads for providing such social services to masses because of relatively lower unit costs rather than to those divergent over geographical limits of an area. Cities are areas with high population concentrations living in intimate proximity; hence these positive amenities are readily available and accessible there. Apart from the spillover effects of concentrations, ills generated from them were also enormous. Population concentrations give rise to conflicts and congestion as well. Hence, the area with higher concentrations may have higher positive as well as negative amenities.

Karachi ranked first for both the highest in-migration and for the highest positive amenities indicator among major cities. Lahore is second and so on. Cities with higher positive amenities indicator also suffer potentially from the negative by-products of higher concentrations as well. Also, initially, the prime objective of migrants in their working life is earning rather concerning about amenities, especially the negative ones. Hence, despite the

high negative amenities indicator, cities seems to have high in-migration as individuals got compensated economically for bearing them.

Table 5

Urban amenities influencing migration in major cities of Pakistan

Urban Amenities Influencing Migration (Average of 7 Years)				
S. No.	Cities	Migration	Positive Urban Amenities Indicator	Negative Urban Amenities Indicator
1	Karachi	2234148	722.91	223592.04
2	Lahore	1057704	554.79	387711.51
3	Rawalpindi	394077	359.85	68028.05
4	Faisalabad	359138	337.98	97595.56
5	Islamabad	276048	268.78	67961.81
6	Peshawar	250670	217.63	78086.71
7	Gujranwala	194122	249.86	61440.89
8	Hyderabad	138566	240.70	14176.05
9	Multan	130691	244.32	174533.10
10	Bhawalpur	77140	290.43	50132.38
11	Sialkot	40765	295.97	50574.85
12	Sukkur	32936	178.08	8106.43
13	Sargodha	31901	282.00	40306.32
14	Quetta	27356	218.15	32730.84

Source: Author's Tabulation.

4.4. Foreign Direct Investment in City and In-Migration

Cities with greater foreign direct investment generate greater and better employment opportunism than local investment, which in turn increases labour demand that has to be met either locally or migrated labour force. Thus cities with high FDI signals migrants to rush towards them.

Karachi and then Lahore holds the highest FDI index among all cities. These two cities facilitate other cities, host migrants and provide social, political and economic opportunities as well. The index for Faisalabad is almost half that of Lahore and so does its in-migration. Developments carried out in Peshawar and Multan might be contributing to increased employment, in-migration and better FDI indices over there. There also exists a possibility that cities with relatively low FDI indices might have some forces at work such as receiving domestic investment, unfavourable conditions for living in other areas, political or social pressures etc., which are creating employment or catching migrants.

Table 6

City-wise FDI indices, in-migration and employment for the year 2012-2013

City-wise FDI indices, in-migration and employment				
S. No.	Cities	In-Migration	FDI Indicator Index	Employment
1	Lahore	832993	73.67	1273932
2	Faisalabad	401666	30.17	746108
3	Rawalpindi	384726	22.00	361584
4	Multan	98107	36.17	302701
5	Gujranwala	180678	26.17	328416
6	Sargodha	27436	17.67	99190
7	Sialkot	28505	10.33	105699
8	Bhawalpur	68683	6.67	147636
9	Islamabad	305617	18.50	189238
10	Karachi	1658442	86.17	2823079
11	Hyderabad	108450	21.83	293450
12	Sukkur	25235	15.67	85081
13	Peshawar	254297	36.00	289041
14	Quetta	21570	17.17	120800

Source: Authors calculation using various data sources and official websites.

4.5. City-wise migration: within and across cities

The forthcoming table enlightens our understandings about migration with-in and between cities. Out of total in-migration in these cities, 29.19 % and 25.51 % migration is intra-city migration as per the average and 2012-13 figures. Karachi's share in intra-migration is very much higher for both average around the years and in 2012-13, 23.76 and 19.70 % in the exact sequence as stated. This is understandable as Karachi, the city of lights, is the only city that has five districts in it; otherwise, cities is usually situated with-in a district. This is the reason why statistics for Karachi usually stands out predominantly among other cities. It also has highest in as well as out migration.

Lahore earned the second position for both in and out migration. The rest of the cities follow afterwards. As for the net migration, Hyderabad, Sialkot, Peshawar, Quetta, Sukkur, Sargodha and Multan experience net out migration while Karachi, Lahore, Islamabad, Rawalpindi, Gujranwala and Bahawalpur are more prone to net in-migration for overall average and for the latest year statistics. Faisalabad had net out-migration on average while having net in-migration in 2012-13.

Table 7(a)

Migration with-in and in between major cities

Migration With-in & Between Cities										
Names	Average (7 Years)					2012-13				
	In-Mig[8]			Out-Mig	Net Mig	In-Mig			Out-Mig	Net Mig
	Intra	Inter	Total			Intra	Inter	Total		
	(a)	(b)	(c= a+b)	(d)	(e= c-d)	(a)	(b)	(c= a+b)	(d)	(e= c-d)
Lahore	2.13	10.24	12.37	13.24	10.27	1.14	9.23	10.37	10.83	9.01
Faisalabad	0.57	3.79	4.36	7.66	-3.55	1.39	5.09	6.48	6.91	5.24
Rawalpindi	0.44	4.73	5.17	6.57	1.84	0.73	6.71	7.44	7.95	5.97
Multan	0.45	2.28	2.73	5.18	-3.15	0.41	1.91	2.32	4.95	-5.35
Gujranwala	0.88	5.64	6.53	5.92	7.98	1.45	6.26	7.72	4.82	16.18
Sargodha	0.05	0.62	0.67	3.24	-5.51	0.11	0.52	0.64	3.89	-8.86
Sialkot	0.01	0.71	0.72	5.37	-10.45	0.00	0.28	0.28	3.32	-8.60
Bahawalpur	0.27	1.87	2.13	2.45	1.37	0.27	1.92	2.19	1.58	3.98
Islamabad	0.01	4.65	4.66	1.79	11.55	0.00	5.82	5.82	1.67	17.92
Karachi	23.76	33.02	56.79	33.02	113.80	19.70	34.58	54.28	38.26	101.05
Hyderabad	0.17	1.16	1.33	6.87	-11.97	0.09	1.13	1.22	6.44	-14.02
Sukkur	0.14	0.70	0.84	2.53	-3.20	0.17	0.47	0.64	2.41	-4.54
Peshawar	0.29	1.25	1.54	4.41	-5.34	0.02	0.56	0.58	5.69	-14.35
Quetta	0.02	0.15	0.17	1.76	-3.63	0.02	0.01	0.04	1.30	-3.65
Total	29.19	70.81	100.00	100.00	100.00	25.51	74.49	100.00	100.00	100.00

Source: Author's Tabulation.

5. Regression Analysis

The outcome of both estimation techniques is tabulated below for easy comparison. Post estimation tests of GMM estimation are reported in Tables A2 and A3 in Appendix. The informal sector is dropped from the model on the basis of its high correlation with a real gross domestic product, a proxy for the city's economic contribution (CEC). The results of the Tobit and GMM estimations of the model presented in equation 3.6 of chapter 3, are reported in Table 1.

All variables bear correct signs except for distance in both regressions. Distance is significant in Tobit results, while it is insignificant in GMM results. Distance is found to be positively linked with migration and which is justified partially because of the ease in mobility within the cities with no barriers, controls or policies limiting or directing migration flows. Thus, for individuals, employment opportunities matter more and they are willing to move across distances if they expect to grab either employment or a better employment opportunity at the destination. In-migration is partial, because of the argument that increased expected wages and improved means of transportation vanish distance's negative consideration, especially across Punjab, the province with the majority of the migration flows.

[8] Mig stands for migration.

Table 8

Urban-urban regression model results

Urban-Urban Regression Results						
Method	GMM Results			TOBIT Results		
Regressand	NM*C			NM		
Regressors	Coefficient	Z	P>|z|	Coefficient	Z	P>|z|
NM (-1)	0.132	11.31*	0.000	0.107	2.55*	0.011
D_CEC	0.012	2.46*	0.014	0.022	1.89*	0.058
D_CEC(-1)	0.013	1.46	0.145			
D_UI^{+}	2.544	2.89*	0.004	4.210	2.37*	0.017
D_UI^{-}	-0.007	-2.46*	0.014	-0.014	-2.02*	0.047
D_HC	735.019	2.33*	0.020	934.730	2.08*	0.038
D_DR	-69.732	-0.38	0.705	-787.727	-2.33*	0.020
D_EW	0.023	2.56*	0.010	0.048	2.74*	0.006
D_UER	-30.867	-2.51*	0.012	-57.781	-2.47*	0.014
D_FDI	30.574	0.89	0.374	-38.513	-0.78	0.433
D_EMP (-1)	0.002	2.01*	0.044	0.005	2.01*	0.048
D	7.268	1.11	0.269	2.651	1.73*	0.084
Constant	75118.880	16.89*	0.000	840.752	0.73	0.467
Number of obs		=	1092		=	1092
Number of groups		=	182		=	182
Wald chi2(11)		=	528.6		=	83.49
Prob > chi2		=	0		=	0
Number of instruments		=	49			
Log likelihood		=		-5585.7		
Rho		=		0.4882	0.393	0.584

* Mean significant at less than 5%
** Mean significant at less than 10%
Source: Author's estimation and tabulation using Stata 12.

The economic contribution of a city is reflective of the concentration of economic activities in it, such as investment, production, consumption, trade etc. Hence, cities contributing more towards the national GDP are more prone to net immigration relative to the origin city. If the real GDP of a city increases by one thousand relative to other cities, net immigration to that city increases by 12 migrants.

The three labour market variables that are expected wages, unemployment rate and lagged employment, are statistically significant in both models, endorsing the fact that relative difference in labour market variables even across cities is of immense importance in directing migration flows from one city to another. With a one per cent change in the unemployment rate gap (D_UER) between destination and origin city, net migration change by 31 and 58 migrants as per GMM and Tobit estimations respectively in the opposite direction at the destination city. Likewise, if the expected wage gap (D_EW) between the two cities increases, the city with higher expected wages tend to encounter relatively more in-migration and less out-migration or a net in-migration. The result indicates that if the expected wage gap between cities changes by 1000 rupees, net migration in the city with relatively higher wages changes by 23 (0.023*1000) migrants in the same direction. The greater the gap in lagged employment (D_EMP (-1)) between cities, the greater the net migration is inclined towards the city that relatively has more employment in the previous time period. More

employment in the previous year reflects more investment expenditure in it. Moreover, as investment follows the multiplier effect, more opportunities in the current period are to be generated, which attracts migrants in the current year.

Dependency ratio (D_DR) is insignificant in GMM estimation, while the Tobit estimation contradicts it. More dependency ratio at origin city relative to destination city results in increased net migration at destination through discouraging emigration from destination city and encouraging immigration into it.

A high year of educational attainment in a city is backed by the provision of a sound education system. Inhabitants of cities with better access to education facilities are relatively more productive, efficient and equipped to adopt new technologies easily. Cities with more human capital (HC) attract more investment because of their efficient labour force. Investment generates more employment vacancies, and thus, migrants are attracted toward the city. In both GMM and Tobit results, the statistical significance and positive sign of the coefficient of the variable reflecting human capital have provided evidence for it.

Migration is positively linked with positive amenity provision not only for a better livelihood but also for the betterment of their family. The index for positive urban amenity is significant in GMM and Tobit estimation. The more positive amenities destination city holds in comparison with origin city, more net in-migration is experienced by the destination city. For a unit increase in positive urban indicator gap (D_UI^{+}), net migration is increased by three (GMM results) and four (Tobit results) migrants approximately. Similarly, negative amenities (D_UI^{-}) like congestion and crime in a city discourage immigration and encourage emigration from it. Negative amenities slow down the pace of the city's economic growth.

6. Conclusion and Policy Suggestions

This research is designed to explore and explain the inter-city migration patterns in Pakistan. Migration is a major contributor towards the rapid urbanisation than the natural population increase. Migration is derived by various push and pull factors at various origins and destinations. The desire to be economically prosperous motivates individuals to move towards an area with a relatively better economic and social environment offering a better standard of living. Hence, they move from relatively less urbanised areas to highly urbanised and modernised areas.

This research is unique in explaining intercity migration in the context of Pakistan. The study provides both descriptive as well as regression analysis explaining the relative dominance of one city (urban area) over another, to attract migrants from other cities. The empirical analysis reveals that the relative size of the informal sector in a city and the magnitude of foreign direct investment in them fosters in-migration towards cities. Regression analysis that consist of two regression techniques, generalised method of moments (GMM) and Tobit regression techniques to examine migration across 14 major cities, is focused over a time period of 7 years (2005-2006 to 2012-2013). It is found that the labour market variables (expected wages, employment, and unemployment rate) and regional economic contribution have a strong significant influence on inter-city migration flows. Dependency ratio is

statistically insignificant to affect migration flows as per GMM estimation though it is significant in explaining migration across major cities as per Tobit estimation results. Distance, as suggested by the gravity model, and years of education, reflecting human capital, have a significant positive impact on migration flows across urban-urban (cities) regions. Further migration flows are significantly depending on the area or regional positive and negative amenities attached to it, supporting theories of location.

Government policies, in developing countries especially, are of immense importance in shaping and directing migration flows in order to accelerate the pace of sustainable development. In developing countries, a balanced growth strategy is difficult to adopt usually owing to lack of availability of funds. Thus, an unbalanced growth strategy is being implemented, usually biased towards a few urban regions. The policies implemented are unduly inclined towards rapid urbanisation via industrialisation. As a result, investment is confined to some specific regions leading to unequal income distribution and disparities across regions, provoking migration towards few urban centres. A number of valuable policy recommendations can be drawn from this research that would enable the government and the relevant authorities to control and direct migration towards the betterment of our nation and converge it towards the path of prosperous relative balance growth and development.

Government should revise its policies in favour of balanced growth of regions and cities. It should make effective policy arrangements for slowing down the pace of rapid urbanisation, concentrating in only a few regions or cities; rather, it should divert and boost the process of urbanisation to small towns and rural areas. This would help not only in growing the number of urban areas, but also stabilises the existing major urban centres like Karachi and Lahore, for which diseconomies of scale are becoming persistently more visible with the bulk of masses moving into them year after year, making their sustainable development debatable. Even across major cities, there exist inequalities in their growth resulting from biased policies in favour of a few cities. Government should accelerate development in comparatively smaller cities rather than over-investing in one or two. Migration is considered as an equilibrating response to existing disparities and disequilibrium among regions and across cities and the government should come forward to reduce this urban bias. The concentration of economic activities generates employment opportunities which are a strong driver of migration and development of the region. Hence, if the government wants to target the development of various regions following a balanced strategy, it should divert economic activities towards the targeted region and cities.

Provision of basic utilities and facilities such as health, education, recreational activities, stable law and order conditions etc., also plays a vital role in shaping migration and encouraging a region's growth. These factors can also be used by the government to formulate effective policies regarding migration and growth. Availability of better health, education and political stability across regions would diminish the need to move towards certain specific areas for such facilities and would eventually reduce the unnecessary burden from these specific host regions and cities. Moreover, the provision of health and education facilities across regions would increase labour productivity and efficiency. They would become more skilled, trained and productive, thus would contribute more towards national development and growth.

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APPENDIX

A-1. Correlation matrix of the variables in urban-urban regression

Correlation Matrix	D_DR	D_HC	D_EW	D_FDI	D_IFS	D_NUI	D_CEC	D_UER	D	D_EMP (-1)	D_PUI
D_DR	**1.000**										
D_HC	-0.098	**1.000**									
D_EW	-0.077	0.661	**1.000**								
D_FDI	-0.119	0.025	0.092	**1.000**							
D_IFS	-0.234	-0.007	-0.004	0.898	**1.000**						
D_NUI	-0.189	0.125	0.065	0.586	0.828	**1.000**					
D_CEC	-0.211	0.064	0.067	0.492	0.980	0.680	**1.000**				
D_UER	0.268	-0.071	-0.522	-0.126	-0.161	-0.089	-0.146	**1.000**			
D	0.036	-0.037	-0.027	0.013	-0.011	0.004	-0.004	0.059	**1.000**		
D_EMP (-1)	-0.209	0.053	0.056	0.591	0.981	0.819	0.699	-0.154	-0.006	**1.000**	
D_PUI	-0.171	0.224	0.131	0.699	0.701	0.696	0.741	-0.111	-0.002	0.753	**1.000**

A-2. Urban-urban regression model post-estimation Sargan test of over identifying restrictions

Urban-Urban Regression Model		
Sargan test of over identifying restrictions		
H0: over identifying restrictions are valid		
chi2(34)	=	18.69218
Prob > chi2	=	0.6503

A-3. Urban-urban regression model post-estimation Arellano-Bond test for autocorrelation

Urban-Urban Regression Model		
Arellano-Bond test for zero autocorrelation in first-differenced errors		
Order	**z**	**Prob > z**
1	-4.6705	0
2	-0.06827	0.9456
H0: no autocorrelation		