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Determinants of Intercity Migration in Pakistan: A Dynamic Panel Data Approach

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ABSTRACT

Intercity migration is one of the most important sources of rapid population growth in big cities, especially in the developing countries. Cities differ from each other in terms of the availability of economic and social opportunities which motivate people to move from less populous areas to more populous areas with a view to benefit from better socio-economic opportunities. The model of the study is based on the extended gravity model of migration. The dynamic panel data approach is being used to examine the determinants of intercity migration. The data is taken from the Labour Force Survey of Pakistan and Development Statistics of each of the four provinces of Pakistan from 2010-2011 to 2020-21 covering fourteen major cities of the country. The results of the study showed that the cities with a higher economic status offered more employment opportunities, higher average expected real incomes, greater influx of migration and increased average years of schooling. Moreover, it was found that with higher incidence of reported crime, a greater extent of congestion and an extended distance inhibited an individual's motivation to migrate.

INTRODUCTION

Internal migration is a widely acknowledged phenomenon as a significant contributor to urban population growth. The geographical disparities are considered as a root cause of the population drifting from less privileged to more privileged areas (Smith, 1776; Hicks, 1932; Lewis, 1954 ;Massey,2003; Kanbur ,2005; Ballas 2018; and Manduce,2019). Pakistan is one of the most urbanized countries in the world with 3.65% urban growth rate. The censuses (2023) statistics showed that 39% (93.7 million) of the total population (241.5 million) lived in urban areas. According to the Population Census 2023, Pakistan has 624 urban places in total out of which Punjab had 257, Sindh 197, KPK 62 and Baluchistan 61.

Urban population growth comes from three distinct sources, firstly, net natural increase, secondly, net migration in the urban centre either internally or externally and thirdly, spatial expansion of cities and towns to compile the surrounding areas of the city. In Pakistan, natural increase is the most significant factor that contributes 70% to raise the urban population growth, while internal migration constitutes 27%, reclassification of urban areas contributes 9.7% and the remaining 0.7% is due to the other factors[1].

However, the extent of the urbanization growth is not uniform all over the country. The cities differ in terms of social and economic opportunities. The city is characterized

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[1] United Nations Development Programme (UNDP), 2018

to possess better health, economic opportunities and social structure attract the larger pool of migrants. Thus, the more developed regions receive greater influx of migrants as compared to the others (Liao & Wang, 2019; Wajdi, Adioetomo, & Mulder, 2017 and Kim, 2015). Lahore receives more migrants than any other city in Punjab. As per the Labour Force Survey (2020-21), whereby 15% of Punjab's migrants move to Lahore. People migrate not only from small cities but also from the large cities. It was observed that Lahore received 8.4% of its migrants from Faisalabad and Gujranwala[2].

Table 1 shows the distribution of migrants from the big cities and the other cities. Karachi and Sialkot receive the largest influx of migrants from big cities (about 63% and 61% respectively), followed by Gujranwala (55%) and Islamabad (50%). However, Peshawar (7%), Sukkur (14%) and Hyderabad (17%) receive the least proportion of the migrants from the big cities.

Table 1

Average inter-city migration

Average Inter-City Migration (%)			
Cities	**Total**	**Big Cities**	**Other Cites**
Bahawalpur	100.00	28.30	71.70
Faisalabad	100.00	32.22	67.78
Gujranwala	100.00	55.47	44.53
Hyderabad	100.00	17.94	82.06
Islamabad	100.00	50.57	49.43
Karachi	100.00	63.40	36.60
Lahore	100.00	30.61	69.39
Multan	100.00	27.88	72.12
Peshawar	100.00	7.06	92.94
Quetta	100.00	13.73	86.27
Rawalpindi	100.00	38.58	61.42
Sargodha	100.00	34.94	65.06
Sialkot	100.00	61.41	38.59
Sukkur	100.00	14.20	85.80

Source: Authors' tabulation from Labour Force Survey (2020-21)

The existing literature on migration in Pakistan is mostly limited to the micro approach to migration (Kanwal, Naveed, & Khan, 2015; Ahmad, Akram, & Hussain, 2014; Imran, Nawaz, Asim, & Hashmi, 2013; Khan & Shehnaz, 2000; Perveen, 1993; Ahmed & Sirageldin, 1993 and Nabi, 1984). Studies related to rural-urban migration in Pakistan are based on a microeconomic foundations where the individual's decision to migrate depends on personal characteristics of the migrant. (Umair & Lubna, 2019; Ahmad, Akram, & Hussain, 2014; Imran, Nawaz, Asim, & Hashmi, 2013; Memon, 2005). However, little attention has been paid to the possibility of urban to urban migration in Pakistn.

The work of Mahmud, Musaddiq, Said, & Sabirm (2010) and Barkley (1991) have made a macro approach to migration but were unable to address the issue of endogeneity. The objective of this study is to examine the factors that determine the pattern of inter-city migration in Pakistan. The study contributes to the literature by considering not just rural-urban migration but also urban-urban migration through the use of dynamic panel data. The organization of this paper is such that, after the introduction, a brief review of the literature is presented in section two. Section three presents the empirical models and data sources, followed by the methodology in the section four. Results discussions are carried out in section five, followed up by the conclusion section at the end.

LITERATURE REVIEW

Several studies have examined the factors that contribute to migration decisions. Different positive and negative characteristics of sending and receiving regions serve as potential drivers of migration. These drivers can be categorized into economic, environmental, demographic, and socio-cultural factors among many more. The economic development of a region, measured by gross domestic product, is one of the major determinants of migration. Regions with higher per capita GDP provide more economic incentives and a better standard of living and therefore, receive a mass influx of migrants (Wang, Shen &Liu, 2023;Liao & Wang, 2019; Wajdi, Adioetomo, & Mulder, 2017; Kim, 2015; Foley & Angjellari-Dajci, 2015; Pose & Ketterer, 2012; Etzo, 2011; Nguyen-Hoang & Mcpeak, 2010; Ghatak, Mulhern, & Watson, 2008; Fan, 2005; Chen & Coulson, 2002 and Bouare, 2001-2002).

People are willing to move from low-income areas to high-income areas, thus, income differential is regarded as one of the major pulling factors in the process of migration (Mulhern & Watson, 2009; Zhang & Song, 2003; Vietti & Scribner, 2013; Simpson 2017and Langella 2021). High agricultural productivity, the share of irrigated lands, number of established firms, industrial electricity consumption and number of automobiles per capital serve as proxies of a better standard of living and are positively

[2] Javed & Khan (2018)

related to migrants' settlement decision as per Doğan & Kabadayı (2015) and Joseph & Wodon (2013).

The difference in the labour market conditions prevailing at the origin and the destination, affect the distribution of population across regions and receive great importance in theoretical as well as empirical literature. Regions with higher wages and greater employment opportunities are more attractive to migrants. It is widely held that people are more willing to move to areas with higher wages and better employment opportunities (Liu & Shen, 2014; Buch, Hamann, Niebuhr, & Rossen, 2013 and Pose & Ketterer, 2012). The relative sizes of the informal sectors across the origin and destination also induce people to migrate (Villarreal & Hamilton, 2012). Chen & Coulson (2002) argued that the share of self-employed businesses and private proprietorship at the destination also serves as a major temptation for the migrants. Similarly, regions with a greater inflow of foreign direct investment become a core attraction for the people, because they can generate more employment opportunities (Doğan & Kabadayı, 2015; Liu & Shen, 2014 and Villarreal & Hamilton, 2012).

High population servers as a pull as well as a push factor for the migrants. The high population at the destination receives a mass influx of migrants because densely populated areas are expected to have more economic opportunities, better educational and health facilities and have a wide range of urban amenities (Wajdi, Adioetomo, & Mulder, 2017; Doğan & Kabadayı, 2015; Kim, 2015; Liu & Shen, 2014; Villarreal & Hamilton, 2012; Etzo, 2011 and Fan, 2005). It is argued that more urbanized areas serve as a centre of migrants' attention (Joseph & Wodon, 2013; and Mahmud, Musaddiq, Said, & Sabir, 2010). It has also been argued that a high population at the origin also serves as another driving factor because of having more sending capacity and is positively related to migration outflux (Wajdi, Adioetomo, & Mulder, 2017; Nguyen-Hoang & Mcpeak, 2010 and Fan, 2005).

Besides, economic opportunities and differences in the labour market conditions, there are other factors too that attract people to migrate. Networks and kinship in destination, facilitate the process of migration by reducing the cost to migrate. People who have friends or family at the destination face fewer costs of job search, low or no residential cost and significantly reduced psychological cost. People are more willing to move to areas with migration stock (Wajdi, Adioetomo & Mulder, 2017; Pose & Ketterer, 2012 and Fan, 2005). Thus, having networks and kinship in destination reduces people attachment to their current location and make them more prone to migration (Etzo, 2011; Yang, 2000 and Bouare, 2001-2002). On the contrary, lack of social network at a destination or having a strong local association at the origin increase people's psychological cost of moving and thus negatively influences the migration (Adams, 2015 and Tsegai, 2007).

The sense of being safe and living in a better social climate is one of the top priorities nowadays and gaining great importance in the migration literature. Several studies have found that people get attracted to the areas with a better social climate whereas high crime-prone areas face large migration out flux. Regions with a better social climate serve as a centre of people attraction (Liao & Wang, 2019). On the other hand, a high crime rate serves as the major push factor in the process of migration (Buch, Hamann, Niebuhr, & Rossen, 2013 and Bouare, 2001-2002). Vietti & Scribner (2013) in their study have developed a state security model and found a strong negative influence of crimes like human trafficking and smuggling, sexual abuse, sexual and physical violence on the flow of migration.

Other than push and pull factors, some intervening obstacles keep people to their current location. One of those intervening obstacles is distance - a widely used gravity variable. Several macro studies have shown that people are more mobile to areas close to them. In other words, people are more willing to move to the short distance, as long distances are related to the high cost of moving and high psychological cost (Wajdi, Adioetomo, & Mulder, 2017; Liu, Wang, & Chen, 2016; Villarreal & Hamilton, 2012; Etzo, 2011; Nguyen-Hoang & Mcpeak, 2010; Mulhern & Watson, 2009; Ghatak, Mulhern, & Watson, 2008; Fan, 2005; Zhang & Song, 2003).

Poverty trap and financial constraints make it difficult for people to finance moving costs and make them less mobile. Lack of resources to move stick people to their current location even if they want to move as discussed by Adams (2015), Nguyen-Hoang & Mcpeak (2010) and Andrienko & Guriev, (2004). Thus, existing literature supports the fact that regional differences in the term of better socio-economic opportunities are the root cause of migration.

Model 1:

$$NM_{ijt} = \alpha + \delta NM_{ij(t-1)} + \gamma_1 D_{ij} + \gamma_2 D\_CREP_{ijt} + \gamma_3 D\_AYS_{ijt} + \gamma_4 RC_{ijt} + \gamma_5 D\_Congestion_{ijt} + \gamma_6 D\_AERI_{ijt} + \gamma_7 D_{SIS_{ijt}} + e_{ij} + u_{ijt} \quad (1)$$

Model 2:

$$NM_{ijt} = \alpha' + \delta' NM_{ij(t-1)} + \gamma'_1 D_{ij} + \gamma'_2 D\_CREP_{ijt} + \gamma'_3 D\_AYS_{ijt} + \gamma'_4 RC_{ijt} + \gamma'_5 D\_Congestion_{ijt} + \gamma'_6 D\_AERI_{ijt} + \gamma'_7 D_{SIS_{ijt}} + \gamma'_8 ER_{ijt} + e'_{ij} + u'_{ijt} \quad (2)$$

Where NM is Net Migration

D is the distance between the cities 'i' and 'j'.

D_CREP is the difference in city real economic product between cities 'i' 'j' at a time't'.

D_AYS is the difference in average years of schooling between cities 'i' and 'j' at a time't'.

D_RC is the difference in reported crimes between cities 'i' and 'j' at a time't'.

D_Congestion is the difference in congestion between cities 'i' and 'j' at a time't'.

D_AERI is the difference in average expected real income between cities 'i' and 'j' at a time't'.

D_SIS is the difference in the size of the informal sector between cities 'i' and 'j' at a time't'.

D_ER is the difference in the employment rate between cities 'i' and 'j' at a time't'

u_{ijt} and e_{ij} are the time-variant and invariant error terms respectively.

Average Real Expected Wages

As per Todaro, the decision of people to migrate depends on the expected income rather than actual income. In literature, the average income is found to be positively related to migration (Sjaastad, 1962). According to Hicks (1932) "The difference in the net economic advantage (wage differential) is the main cause of migration".

Employment Rate

There is ample evidence that localities with abundant employment opportunities attract a sizable number of migrants and therefore has a positive influence on migration (Liu & Shen, 2014; Buch, Hamann, Niebuhr, & Rossen, 2013 and Pose & Ketterer 2012).

City-wise Real Economic Product

The economic product of the city is used as a proxy of economic development and higher wages (Etzo, 2011). The areas with higher economic value are characterized by higher standards of living, better economic opportunities, more investments and higher income, therefore has a positive influence on the migration influx (Liao & Wang, 2019; Wajdi, Adioetomo, & Mulder, 2017; Kim, 2015; Foley & Angjellari-Dajci, 2015; Pose & Ketterer, 2012; Etzo, 2011 and Nguyen-Hoang & Mcpeak, 2010).

Migration Stock

Migration stock is defined as the number of previously migrated people from origin to destination. Peeters (2012), Fan (2005) and Greenwood (1969 & 1975) have held that migration stock eases the choice of migration by reducing its cost and uncertainty associated with it, utilizing access to greater information regarding the destination.

Years of Schooling

Availability of high human capital comes from the availability of a sound education system. Cities with higher educational attainment are associated with the availability of high skilled jobs required to adopt new technologies, thereby, generating higher income and attracting more migrants (Liao & Wang 2019; Wajdi, Adioetomo, & Mulder, 2017; Nguyen-Hoang & Mcpeak,2010; Joseph & Wodon, 2013; Pose & Ketterer, 2012 and Andrienko & Guriev, 2004).

Size of Informal Sector

The informal sector is seen as a forum to provide temporary assistance to the people searching for better opportunities in the formal sector (Todaro 1969; Cole & Sanders, 1985 and Fields, 1975), for which evidence was offered by Villarreal & Hamilton (2012).

Reported Crimes

Regions with a better social climate serve as a centre of people attraction (Liao & Wang, 2019). On the other hand, a high crime rate serves as the major push factor in the process of migration (Buch, Hamann, Niebuhr, & Rossen, 2013; Vietti & Scribner, 2013 and Bouare, 2001-2002).

Congestion

The high population density is regarded as a key factor to cause out-migration because of having more sending capacity (Wajdi, Adioetomo, & Mulder, 2017; Nguyen-Hoang & Mcpeak, 2010 and Fan, 2005). Congestion itself is the root cause of many challenges e.g. crowdedness, pollution, poor quality of public services and therefore is likely to exercise a negative influence on migration.

Distance

It can be narrated that, migration deters as physical distance increases. Thus there is a negative relationship between migration (Wajdi, Adioetomo, & Mulder, 2017; Liu, Wang, & Chen, 2016; Villarreal & Hamilton, 2012; Etzo, 2011; Nguyen-Hoang & Mcpeak, 2010 and Mulhern & Watson, 2009).

Data

The data is taken for five years from 2010-2011 to 2020-21 for the fourteen major cities of Pakistan that include Quetta, Hyderabad, Peshawar, Sukkur, Lahore, Multan, Rawalpindi, Sargodha, Gujranwala, Faisalabad, Sialkot, Bahawalpur, Karachi and Islamabad. Data for all the variables except congestion reported crimes and distance were taken from the Labour Force Survey. Whereas, the data of reported crimes and congestion were taken from Development Statistics of Punjab, Sindh, Baluchistan and KPK and the distance from ArcGIS. Appendices define the variables and summary statistics.

METHODOLOGY

Generalized Method of Moments

GMM technique was first introduced by Hansen (1982) and further enhanced by Baum, Schaffe, & Stillman (2003), Blundell & Bond (1998), Arellano & Bond (1991), Arellano & Bover (1995) and Holtz, Newey, & Rosen (1988). GMM is a consistent estimation technique for the dynamic panel set having two main characteristics.

The number of panels is greater than the periods.

$$N > T \qquad (3)$$

The dependent variable is dynamic such that it depends upon its own lagged value.

$$y_{ijt} = f\left(y_{ij(t-1)}, X_{ijt}\right) \qquad (4)$$

GMM is considered the most efficient estimation technique in the presence of such endogeneity. It uses the Instrumental Variable (IV) technique to solve the issue of endogeneity. In addition to the endogeneity, GMM also controls for the omitted variable bias, unobserved panel heterogeneity and measurement errors.

Consider the following dynamic panel data model.

$$y_{it} = \alpha + \delta y_{(t-1)i} + \beta X_{it} + u_i + e_{it} \qquad (5)$$

Where,

y_{it} is the net migration in city 'i' at time't'

$y_{(t-1)i}$ is the lagged net migration in the preceding time period (t-1)

X_{it} is the set of other independent variables of city 'i' at time't'

u_i is the time-invariant error term.

e_{it} is the time-variant error term.

The time-variant error term is likely to correlate with the regressors X_{it} causing the problem of endogeneity. The first difference GMM corrects the endogeneity by differencing the regressors, thus, removes the fixed effect (u_i). As can be seen from the original and transformed model shown by equations (5) and (6) respectively, that problem of endogeneity still prevails because of the correlation between $\Delta y_{(t-1)i}$ and Δe_{it}.

$$\Delta y_{it} = \delta \Delta y_{(t-1)i} + \beta \Delta X_{it} + \Delta e_{it} \qquad (6)$$

Following moment conditions are used in the difference GMM.

$$E(\Delta y_{(t-s)i}, \Delta e_{it}) = 0 \quad for\ all\ s > 2,3 \ldots \ldots T \qquad (7)$$

$$E(\Delta X_{it-s}, \Delta e_{it}) = 0 \quad for\ all\ s > 2,3 \ldots \ldots T \qquad (8)$$

The first difference GMM is weakened in its first difference lagged as an instrument. It also leads to data loss. System GMM corrects the endogeneity by introducing more instruments. It transforms the instruments to make them uncorrelated with the time-invariant error term. System GMM builds a set of two equations; original and transformed. Unlike difference GMM, system GMM uses the orthogonal deviation. Instead of subtracting it from the previous observation from contemporaneous, it subtract the means average of all the future available observations, thus, minimizing the data loss. If the model stated in equation (6) comprises a random walk model, efficient estimates could not get through the difference GMM. In system GMM, the first equation is expressed as level form with the first difference as an instrument.

$$y_{it} = \alpha + \delta y_{(t-1)i} + \beta X_{it} + u_i + e_{it} \qquad (5)$$

The second equation is expressed in the first difference form with level as instruments.

$$\Delta y_{it} = \delta \Delta y_{(t-1)i} + \beta \Delta X_{it} + \Delta e_{it} \qquad ($$

It makes the following addition in moment conditions.

$$E[(\Delta y_{(t-s)i}, (u_i + e_{it})] = 0 \quad for\ s = 1 \qquad (9)$$

$$E[(\Delta X_{(t-s)i}, (u_i + e_{it})] = 0 \quad for\ s = 1 \qquad (10)$$

System GMM uses more instruments than difference GMM which is considered appropriate in the presence of heteroscedasticity and serial correlation. 'Two-step difference and system GMM' is considered efficient rather than 'one step difference and system GMM' because the former is robust to heteroscedasticity and autocorrelation. GMM has wider coverage than the other estimation techniques, for example, Fixed Effect (FE) Random Effect (RE) models, Instrumental Variable (IV) Generalized Least Square (GLS) etc. However, the consistency is based on some specification tests. The validity of instrument and moments conditions check through the Sargan-Hensen test and difference in Sargan/Hensen test. The first and second-order autocorrelation is reported by autocorrelation test. The rejection of second-order correlation gives evidence in the favour of exogeneity of instruments.

The choice between the difference and system GMM can be done by running the pooled OLS and FE model. The OLS estimate of the coefficient of the lagged term serves as an upper bound estimate and the estimate from FE is treated as the lower bound estimate. If the estimated value of lagged term from the difference GMM is closer to or below the FE estimate, then it can be stated that the system GMM is preferable as difference GMM and therefore carries a downward bias. GMM is complicated and can easily lead to misleading results. Small choices could lead to manipulation of results dynamic panel model doesn't account for the cross-sectional dependence. It is not an advisable technique for the long panel.

RESULTS & DISCUSSIONS

The results of Model (1) and Model (2) captured the impact of the difference in the factors prevailing at the origin and the destination on the OD (origin-destination) flows. The variables in the both models were significant and all the variables offered expected signs. The respective F-statistics also confirmed the goodness of fit for the models.

The significant lagged dependent variable in both the models confirmed the validity of using a dynamic panel data analysis. The lagged net migration was used as a proxy of the social network or stock of migration as done by Wajdi, Adioetomo, & Mulder (2017). The lagged net migration in both models showed that the previously migrated people from the origin to the destination exercised a positive influence on the new migrants. The rationale behind this phenomenon is that migration could not be considered as free of cost process because it includes some implicit costs too. Availability of migrant stock at the destination eases the task of migration by reducing costs, such as the cost of information, psychological cost, settlement cost and mitigating the uncertainty associated with migration by providing information about the destination thereby confirming the earlier results of the studies (Wajdi, Adioetomo & Mulder, 2017; Pose & Ketterer, 2012; Etzo, 2011; Fan, 2005; Bouare, 2001-2002 and Yang, 2000).

The difference in the economic conditions prevailing at the origin and destination received great importance in theoretical as well as empirical literature. It was found that the more prosperous regions (in terms of the volume of economic activity there) did attract a more sizeable flux of migrants. More private and public investment are usually carried out in the large cities, offering better economic, educational and health facilities, consequently attracting more migrantswhich is consistent with a large body of earlier investigations (Liao & Wang, 2019; Wajdi, Adioetomo, & Mulder, 2017; Kim, 2015; Foley & Angjellari-Dajci, 2015; Pose & Ketterer, 2012; Etzo, 2011; Nguyen-Hoang & Mcpeak, 2010; Ghatak, Mulhern, & Watson, 2008; Fan, 2005; Chen & Coulson, 2002 and Bouare, 2001-2002).

Expected earning is considered a key determinant of migration. The potential migrants selected the localities where the net benefits from the migrations mainly in income or wage were greater as pointed out by Hicks (1932). People were found willing to settle in high-income areas. Income differentials were found as one of the major pulling factors in the process of migration by Mulhern & Watson (2009); Zhang & Song (2003) and Vietti & Scribner (2013). Similarly, regions with more employment opportunities were found more prone to migration, which was consistent with Liu &

Shen (2014), Buch, Hamann, Niebuhr, & Rossen (2013) and Pose & Ketterer (2012).

Table 2

Results of Two-Step System GMM

	Model (1)	Model (2)
Net Migration	**Coefficients**	**Coefficients**
Lagged Net Migration	0.16***	0.21***
Distance	-79.15***	-112.57***
D_City Product	0.01***	0.04**
D_Average Years of Schooling	6.99**	1.49**
D_Reported Crimes	-0.53**	-0.10**
D_Congestion	-0.44**	-0.06***
D_ Average Expected Real Income	0.01*	0.01**
D_Size of Informal Sector	0.22***	2.82***
D_Employment Rate	_	0.48***
Constant	-3743.86	-5318.69
AR1	-1.79 (0.07)	-1.16 (0.03)
AR2	-0.21 (0.83)	-1.27 (0.22)
Hasen Test	2.30 (0.51)	1.24 (0.53)
Sagran Test	6.76 (0.14)	6.36 (0.32)
Difference in Hasen Test: GMM Instruments	1.17 (0.55)	1.24 (0.53)
IV instrument	1.48 (0.47)	1.24 (0.54)
Number of Observations	728	728
Number of Groups	182	182
Number of Instruments	12	12

*Significant at 1%, ** Significant at 5%, *** Significant at 10%.

The informal sector absorbs a great deal of migration inflowsbecause all the migrants are not instantly successful in obtaining a job in the formal labour market. The informal sector therefore provides a temporary assistance to the people searching for better opportunities in the formal sector and hence holds a positive relationship with the scale of migration. This finding is consistent with Villarreal & Hamilton (2012), Todaro (1969), Cole & Sanders (1985) and Fields (1975).

The years of educational attainment in the city was found to have a substantial influence on migration and showed a positive impact on net migration in both the models. The cities with more educational facilities attracted people who were seeking higher education. Similarly, more years of schooling was also found to be linked with the occupation structure prevailing at the destination city. The cities with higher years of educational attainments, on average offered high-skilled jobs and higher wages to their residents, thereby attracting more migrants. Liao & Wang (2019), Wajdi, Adioetomo, & Mulder (2017), Nguyen-Hoang & Mcpeak (2010), Joseph & Wodon (2013), Pose & Ketterer (2012) and Andrienko & Guriev (2004) have all shared results that are confirmatory to the findings of the present study in this regard.

The results also show the importance of disamenities in migration decisions. The cities with pleasant environments attracted more migrants, however high crime-prone areas triggered migration outflux. These results were consistent with the findings of Liao & Wang (2019), Vietti & Scribner (2013), Buch, Hamann, Niebuhr, & Rossen (2013) and Bouare (2001-2002). Moreover, it was found that more congested areas were more prone to out-migration for two reasons. Firstly, a larger population possesses a greater sending capacity as explained by Wajdi, Adioetomo, & Mulder (2017), Nguyen-Hoang & Mcpeak (2010) and Fan (2005). Secondly, several issues like crowdedness, pollution, poor quality of public services icentivises people to migrate to a better destination.

Distance, one of the traditional gravity variables, is regarded as an explicit cost of migration. The longer distance between the origin and destination served as a disincentive for the decision to migrate as it increases the cost of migration. The negative influence of distance on the migration has been consistent over a large body of earlier research (Wajdi, Adioetomo, & Mulder, 2017; Liu, Wang, & Chen, 2016; Villarreal & Hamilton, 2012; Etzo, 2011; Nguyen-Hoang & Mcpeak, 2010; Mulhern & Watson, 2009; Ghatak, Mulhern, & Watson, 2008; Fan, 2005; Zhang & Song, 2003).

Both models were validated by the results of various diagnostics tests. The failure to reject the AR_2, Sargan / Hansen test and difference in the Hansen test established that the models were correctly specified and instruments were exogenous. Moreover, the number of the instruments were less than the number of groups, therefore there was no issue of excess of instruments.

CONCLUSION

Migration is a complex phenomenon that generally expresses an urban bias. The cities are different in terms of the availability of economic opportunities and urban amenities, thereby, receiving disproportionate shares of total migrants. Therefore, the focus of the study was to examine the effect of different economic and social factors that accelerated and restrained the process of migration for selected data. For this purpose, the extended gravity model was used as a means of theoretical guidance on this exceedingly complex issue of human choice.

The findings of the economic factors included many factors (City economic product, employment rate, unemployment rate, the average expected income and informal sector) that indicated that regional disparities were among the major pull factors supported by the initial work of Hicks (1932), Lewis (1954) and Smith (1776). The people were more willing to move to the more prosperous cities in terms of their output, employment opportunities and respective income differentials. The positive and the significant impact of social networks confirmed the validity of the work of Greenwood (1969 & 1975) on Pakistan. People take into account the different costs they have to incur and try to minimize the risk by moving to an area for which they have some prior information through social networks.

Similarly, the level of educational attainment also affects the flows of migration. People are more willing to move to areas with greater educational facilities and a skilled occupational structure. All such factors served as the pull factors and were considered as a key to migration.The push factors, on the other hand, restrained the migration. These factors included reported crimes and congestion. High crime-prone areas disincentivised the people to move there, as it was considered a threat to their lives and property. Similarly, the more congested areas, not only provided higher potential to send out more people but also coincided with many other social and environmental issues.

Lastly, the intervening factor, distance, was regarded as a very important factor in the list. The distance was found to have a negative influence on migration, longer distance increased the cost of migration. This finding was similar to the work of Greenwood (1997), which summarized the law of migration with the conclusion that migrants preferred to move to short distances and moved to long distances only for larger cities. Thus, the study can be proved beneficial to policymakers and local governments as it shed light on the availability and unavailability of different major socio-economic opportunities and amenities in different areas of Pakistan. The provision of basic economic and location-specific amenities reduces the rapid urbanization or concentration of population in few regions only. By extending the non-agricultural opportunities, providing access to the financial markets, undertaking more investments in the rural infrastructure and creating training opportunities reduces the rapid wave of urbanization or concentration of population in few regions only.

Manufacturing is usually considered as the key to elevating the industrial base of the economy. The expansion of labor-intensive and small-scale industries in rural and urban areas can absorb excess labour by generating employment opportunities in the manufacturing sector. Since the local conditions may vary across different areas in a country, decentralization of authority to the municipalities may lead to an improvement in the provision and quality of public services. It is considered extremely essential to ensure transparency and accountability for the management of urban sprawl and service provision.

Conflict of Interests

The authors has declared that no competing interests exist.

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APPENDICES

Table A.1

Definitions of Variables

Variables	Definition	Definition Source
Net Intercity Migration	Migration means the population's movement from one administrative district to another administrative district at any time of their lives and excludes the ones moved within the current district". Likewise, "Intercity migration is the movement of people within the country from one city to another	Labour Force Survey
Average Real Expected Wages	Expected wage by following the definition of Harris and Todaro (1970) is defined as real wage time probability of attaining employment in the destination. To make real wages, city-wise consumer price indices will be taken from inflation monitor published by the State Bank of Pakistan	Harris and Todaro (1970)
Employment Rate	Employment comprises all the person ten years of age and above who worked at least one hour either self-employed or paid-employed during the reference period.	Labour Force Survey
Size of Informal Sector	The informal sector includes all the household enterprises owned and operated by an own-account worker, enterprises owned by employers with less than 10 persons excluding all the enterprises engaged in agricultural activities or non-market production	Labour Force Survey
City-wise Real Economic Product	UN-HABITAT (2016) has purposed a framework to calculate the city-wise GDP as, "Ratio of city employees in a sector to national employment is to be calculated. This ratio is multiplied by the national GDP of that sector. This is repeated for each sector, and the resultant numbers summed up to arrive at the figure for City Product".	UN-HABITAT (2016)

Table A.2

Summary Statistics of GMM Models

		Mean	SD	Mini	Max	Observations	
Net -Migration	Overall	0.00	25.87	-200.00	200.00	N	910
	Between		22.06	-122.00	122.00	n	182
	Within		13.58	-165.00	165.00	T	5
D_Employment Rate	Overall	-0.05	3.65	-11.88	11.88	N	910
	Between		2.87	-7.61	7.61	n	182
	Within		2.26	-8.04	7.95	T	5
D_Average Year of Schooling	Overall	0.00	1.71	-4.88	4.88	N	910
	Between		1.61	-4.17	4.17	n	182
	Within		0.59	-2.20	2.21	T	5
D_Size of Informal Sector	Overall	3.56	664.77	-1933.00	1933.00	N	910
	Between		621.93	-1680.70	1657.50	n	182
	Within		238.37	-666.14	673.26	T	5
D_Real City Economic Product	Overall	540.12	208731.00	-645149.8	645149.8	N	910
	Between		196477.80	-537910	521512.9	n	182
	Within		71658.93	-178217	179297.3	T	5
D_Reported Crimes	Overall	84.88	29420.73	-85909.00	85909.00	N	910
	Between		29324.91	-76369.60	76369.60	n	182

	Within		3068.14	-12932.12	13101.88	T	5
D_Congestion	Overall	-0.98	2274.18	-5190.91	5190.91	N	910
	Between		2276.93	-4994.05	4994.05	n	182
	Within		101.47	-414.48	430.33	T	5
D_Average Real Expected Income	Overall	473.36	15962.45	-70778.53	70778.53	N	910
	Between		9602.43	-23013.55	23013.55	n	182
	Within		12767.11	-47537.76	52578.44	T	5
Lagged Net Migration	Overall	0.00	26.97	-200.00	200.00	N	910
	Between		22.90	-129.50	129.50	n	182
	Within		14.32	-172.50	172.50	T	5
Distance	Overall	47.26	27.37	1.00	94.00	N	910
	Between		27.43	1.00	94.00	n	182
	Within		0.00	47.26	47.26	T	5

Table A.3

Correlation Matrix of GMM Models

	Employment Rate	Average Year of Schooling	Size of Informal Sector	City Real Economic Product	Reported Crimes	Congestion	Average Real Expected Income	Lagged Net Migration	Distance
Employment Rate	1.00								
Average Year of Schooling	-0.34	1.00							
Size of Informal Sector	-0.23	0.24	1.00						
City Real Economic Product	-0.22	0.28	0.97	1.00					
Reported Crimes	-0.14	0.26	0.59	0.55	1.00				
Congestion	-0.09	0.48	0.76	0.73	0.78	1.00			
Average Real Expected Income	0.07	0.22	-0.18	-0.13	-0.12	-0.04	1.00		
Lagged Net Migration	-0.07	0.29	0.17	0.24	0.12	0.23	0.00	1.00	
Distance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00