REMITTANCES

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Measuring the Impact of Remittances on Housing Demand: Evidence from Large Cities in Pakistan

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ABSTRACT

The study investigates the impact of remittances on housing demand in large cities in Pakistan. Heckman's sample selection model is used to assess the effects of remittances on standardised housing units using the Household Integrated Economic Survey (HIES) 2015-16. Housing prices are calculated using the hedonic model that captures locational variations. The results show that remittances have a positive and significant impact on housing demand in large cities in Pakistan. Foreign remittances lead to a considerable increase in the need for new houses by increasing the purchasing power of households. With more resources, households are increasing their housing expenses. Besides, remittances have a positive and significant impact on rooms per person, which is indicative of accommodation capacity. The considerable contribution of remittances to increase the new demand for housing among migrant households remains consistent in all provinces. Two implications emerge from this analysis. On the one hand, remittances facilitate overcoming the housing deficit and, on the other hand, can lead to more congestions in large cities. The government should encourage overseas Pakistanis to invest in new housing schemes launched by the government to meet the housing demand for low and middle-income groups.

Keywords: Housing Demand, Cities, Remittances, Pakistan

1. INTRODUCTION

Remittances are the largest source of foreign exchange earnings in low-and middle-income countries (LMICs). The World Bank estimates show that remittance flow to LMICs grew by 9.6 percent in 2018, to touch a record of US$ 529 billion due to high growth in the United States and a rebound in remittances outflows from Gulf Cooperation Council (GCC) countries (WB, 2019). Foreign remittances are an essential source of much needed foreign exchange in Pakistan. Remittances have helped the country in reducing the current account deficit and external debt burden. Remittances have increased from US$ 1021 million (1.5 percent of GDP) in FY 2001 to US$ 21739 (6.7 percent of GDP) in FY2019, showing an exponential increase in the last two decades (SBP, 2019).

A bulk of the literature has shown a significant contribution of remittances to increase economic growth and reduce poverty (Abduvaliev and Bustillo, 2020; Sutradhar, 2020). In developing countries, remittances are considered an important source of stable income to smooth household consumption (Abduvaliev and Bustillo, 2020). Remittances are considered one of the critical factors to improve the economic wellbeing of the households and support the overall economic development in Pakistan (Amjad et al., 2017; Arif et al., 2020; Javid et al., 2012; Kousar et al., 2019; Kuo, 2019; Muhammad and Ahmed, 2009). Migrants send remittances to their families living in the home country to satisfy their daily consumption and health needs. They also focus on savings for their future needs such as higher education of their children, marriages and to construct new house and energy consumption (Abdin and Erdal, 2016; Ahmed et al., 2018a, 2018b; Amjad et al., 2015; Ariadi et al., 2019; Farooq and Iqbal, 2015).

A strand of the literature shows that remittances are a significant source of investment to buy and construct a new house (Amega, 2018). The studies discussing the influence of remittances on demand for housing are indicating positive impacts not only on housing demand but amenities relevant to housing quality also. Quashie (2019) argues that remittances are a vital tool to enhance housing qualities in Caribbean cities—construction of additional rooms, maintenance of housing, and the expansion of housing facilities. Similarly, Ali et al. (2019) are suggestive of beneficial effects of remittances on reducing poverty and household living standard in Sub-Saharan African countries. Subsequent literature also makes evident the significant impacts of remittances on household living standards and housing demand in developing countries (Amega, 2018; Rivera and González, 2017; Simpson and Sparber, 2020).

This discussion shows that remittances could be the vital determinants of housing demand and quality in developing countries like Pakistan. It seems a way out for households to meet their housing demand and expansion of houses in Pakistan. Nonetheless, due to overwhelming urbanisation in Pakistan, housing demand is rising. Mainly, big cities like Lahore, Karachi, Faisalabad, and Rawalpindi are absorbing millions of migrants from rural areas, which bring about significant problems relevant to the housing sector: widening gap between demand and supply of houses, congestion, housing-related facilities (Ahmad et al., 2018).

According to Government of Pakistan, in the urban area, 30 percent of households are living in a one-room house, 31.68 percent households are residing in two-room houses, 29.23 percent households are compelled to dwell in three to four-room houses, while 8.72 percent families are living in five or more-than-room houses in Pakistan. These figures highlight the meagre condition of household dwelling in urban areas. Moreover, housing crises does not confine to the national level, but it also prevails among intra-and-inter provinces. Estimates, based on the Pakistan Social and Living Standards Measurement Survey (PSLM) and Census 2017, show that existing housing stocks are around 23.8 million housing units, while housing needs are approximately 34.1 million housing units. This implies that Pakistan is currently facing a total housing backlog of 10.3 million housing units (Iqbal, 2020). The shortage of urban housing is estimated at around 3.4 million housing units (housing needs are 12.5 million units, while current stocks are only 9.2 million units). In comparison, the shortage of rural housing is over 7 million housing units (housing needs are 21.5 million units, while current stocks are only 14.6 million units).

Keeping in view the rising housing demand, this paper aims to investigate the impacts of remittances on housing demand and quality in large cities in Pakistan. Heckman's sample selection model is used to assess the effects of remittances on standardised housing units using the Household Integrated Economic Survey (HIES) 2015-16. Housing prices are calculated using the hedonic model that captures locational variations. The housing quality is observed by the number of room availability per person.

This paper contributes to the literature in many ways. First, according to our best of knowledge, this the pioneer study that investigates the impact on remittances on housing demand in large cities in Pakistan using HIES data. Second, this study measures the impact of remittances on housing demand at the provincial level. The provincial analysis helps to capture the regional disparities across Pakistan (Iqbal and Nawaz, 2017; Nawaz and Iqbal, 2020, 2016). Last but not least, it provides the foundation to tackle the housing crises in Pakistan.

The rest of the paper is organised as follows: Section 2 includes a literature review, whereas section 3 presents trend analysis of remittances; section 4 explains the data and methodology; section 5 offers results and discussion, and the last section concludes the debate.

2. LITERATURE REVIEW

The remittances sent by international migrants worldwide are an essential source of external finance for many developing countries (Mohapatra and Ratha, 2010). Remittances, which make up a considerable percentage of GDP in developing countries, contribute effectively to economic growth through enhancing investment, providing the balance of payment supports, and building foreign exchange reserves (Adams, 1991; Arif, 2009). Remittances are also crucial for the well-being of the household because their inflows reduce poverty and allow recipients to ensure smooth consumption. They reduce the risk and increase investment opportunities at the household level, especially in the areas where the credit, insurance, and capital markets are absent or imperfect (Taylor and Martin, 2001).

This section presents a brief overview of the literature with a focus on remittances and housing demand. Gilani et al. (1981) stated that Pakistani working abroad send their remittances to support the consumption needs of their family. The significant share of remittances is used in the expenditures of families' daily consumption needs (62 percent), whereas 22 percent of its share is invested into real estate and housing; the rest is used in financial investment in Pakistan. Additionally, the significant percentage of remittances from the foreign migrants is spent on buying housing units, along with other durable goods for their consumption needs in Pakistan. Another study shows that a significant share of the remittances received from the Middle East migrants is spent on recurring consumption, marriages, and consumption of durable goods, whereas 21.68 percent is spent on the real estate and housing expenses (Amjad, 1986).

Investment in the housing market is typical for the families that fail to enjoy the benefits of living in their own house for various reasons. Findlay & Samha (1986) argue that remittances are invested in the housing market in Amman and Jordan. Though these houses remain empty for most of the year and are used only when the migrants visit their home country. Lawless (1986) also found similar investment trends for Algerian immigrants. Facts are concluded that the migrants try to secure their future needs on repatriation to their homelands. Massey et al. (1990) highlighted similar results for the Mexican migrants in the United States, where the significant share of remittances is spent on housing investment, business, and purchasing land. Investment trends for the migrants of rural Egypt were investigated by Adams (1991) and found that more than half of the remittances received were spent on the construction and maintenance of their houses. It was also observed that the ratio of spending on housing investment was higher in migrants as compared to the residents.

Osili (2004) used data on Nigerian migrants living in the USA to investigate the relationship between migrants and their native communities. The study found a common trend of investment of remittances in real estate, the housing market, and business and to acquire financial assets in their country of origin. Serageldin et al. (2004) found a matching trend in Cuenca city, where 50 percent of remittance flows during construction, housing, and asset purchasing, as the investment is considered non-risky for the migrants in Latin America. Such an investment trend, nonetheless, is the cause of high prices in the real estate and housing market. Similarly, Kagochi & Kiambigi (2012) investigated the impact of remittances on the housing sector of Kenya. Results indicated a positive effect of remittances on the development of the housing sector while increasing the demand for housing construction.

Numerous studies have investigated the impact of remittances on various socioeconomic indicators in Pakistan using household data. This literature has established the interest of migrant workers and their families to improve their housing conditions by investing the remittances. The spending trend of remittances in Pakistan is investigated by Arif (2009) for the migrants living in Saudi Arabia. Other than the frequent use of remittances on daily consumption, education, housing, and land purchase are identified as a few other areas of spending. It was found that remittances in Pakistan are used to repay the loans, buy agricultural machinery, and to meet marriage expenditures. The Major share of remittances is used to purchase farm machinery and land, whereas the house ownership trend increased because of the migration of any of the family members. Therefore,

migration has a considerable influence on house ownership and the quality of housing. Arif (2009) concluded that housing facilities had been improved as compared to pre-migration facilities among migrant households. Arif (2009) stresses that a large proportion of remittances are spent on four sectors: real estate and agricultural machinery, food, marriages, and savings. Seventeen percent remittances were used in real estate and agriculture machinery, 13 percent were used in weddings, 20 percent remittances were used in savings, and the rest for obtaining other items (Table 1). Additionally, the analysis discloses that food, real estate, savings, and marriages remained the critical aspects of the use of remittances in both rural and urban areas. The pattern across the regions/provinces was also the same.

Table 1

Uses of Total Remittances Received by Regions (Percentage Distribution)

	(From August 2008-July 2009)					
Items	Total	Urban	Rural	Punjab	Sindh	Others
Food	9.13	7.46	12.16	7.26	6.02	15.48
Health	2.47	2.39	2.78	1.34	1.74	6.67
Education	2.95	3.13	2.98	1.55	2.95	5.49
Real Estate/agriculture machinery	16.68	19.54	13.43	12.90	20.07	12.91
Durable items	10.53	12.34	8.38	10.68	9.80	7.07
Marriage	12.86	14.03	10.68	9.37	20.13	7.10
Loan return	8.34	8.00	9.68	7.47	7.61	9.49
Savings	21.05	22.33	17.99	17.57	23.91	7.73
Donations	2.69	3.11	2.15	2.33	3.06	2.06
Others	13.32	7.68	19.77	29.54	4.71	26.00
All	100.0	100.0	100.0	100.0	100.0	100.0

Source: Arif (2009).

Arif (2009) further highlights that remittances have a positive relationship with the quality of housing. The ownership of a residential house has increased from 87 percent pre-migration to 91 percent post-migration. The ownership of a residential home has risen from 78 percent to 85 percent in urban areas and from 96 to 98 percent in rural areas. The significant change was in repairing the housing unit. Remittances money has enabled households to make their houses cemented (Pukka). In rural areas, the proportion of Pukka houses increased from 42 percent before migration to 62 percent after migration.

The change was also considered in urban areas. The other significant change was the addition of new rooms in the existing housing units. On average, there was an addition of one room in the dwelling unit in both urban and rural areas. The proportion of large houses having five or more rooms more than doubled in rural as well as urban areas, while access to electricity was universal before migration, whereas the availability of gas has modestly improved in both urban and rural areas. As compared to 17 percent of rural households having telephones before migration, 48 percent reported this facility at the time of the survey. Modest improvement was also observed in water supply and sewerage (Table 2). This analysis indicates that remittances played a significant role in enhancing the quality of housing and increasing overall housing demand.

Table 2

Migration and Change in Housing Conditions

	(From August 2008-July 2009)					
	Total Sample		Urban Areas		Rural Areas	
Housing Characteristics	Before Migration	After Migration	Before Migration	After Migration	Before Migration	After Migration
% owned house	87.2	91.2	78.0	84.5	95.8	97.5
% Pukka house	59.5	74.6	78.0	87.9	42.3	62.3
% had electricity	99.1	99.3	99.6	99.6	98.6	99.3
% gas connection	52.6	57.8	85.2	90.5	22.2	27.5
% had telephone	39.1	65.3	62.9	83.7	16.9	48.2
% had water supply	52.0	54.6	83.3	87.1	22.9	24.3
% had sewerage	59.3	68.6	84.8	91.3	35.6	47.5
Number of rooms (mean)	3.4	4.5	3.5	4.6	3.3	4.3
House with 5 and more rooms 9%)	15.3	37.2	16.7	41.3	14.1	33.5

Source: Arif (2009).

Ahmed et al. (2010) examined in their study the welfare of the housing sector in Pakistan. In their view of the general equilibrium of the economy, remittances played a vital role. The study concluded that a significant share of remittances was spent on health issues, educational expenditure, and durables, such as buying a new house. However, minor expenses were incurred on food, house maintenance, clothing, tobacco, and transport. The significant share of remittances was spent on durable goods.

Abdin & Erdal (2016) have investigated the impacts of remittances on electricity crises in Pakistan. The findings unleash the positive implications for covering electricity crises. Remittances enable households to use solar energy instruments, which may be helpful to cover energy crises in Pakistan. Furthermore, remittances makeable households to expand their houses: building houses, reconstruction, and adopting housing-related assets. Abbas et al. (2017) have identified the positive impacts of remittances on political and financial development. Financial development enhances economic activities. Another study conducted by Ahmed et al. (2018a) has investigated positive and significant effects on household expectations, which leave beneficial impacts on household asset accumulation in Pakistan. Remittances are an essential apparatus to buy livestock and durable household assets. Besides, remit receiving households improve their housing quality as well.

Similarly, Ahmed et al. (2018b) also investigated the positive effects of remittances on consumption patterns of households. Overseas migration brings about positive impacts on living standards of households through a positive income effect. Likewise, Kousar et al. (2019) estimated the role of remittances on poverty and inequality in Pakistan. Findings of their study are suggestive of positive effects on reducing poverty among those households

which are receiving remittances. It also enables households to raise their living standard—construction of houses in suitable localities, buying assets, and creating further livelihood for other household members. This shows that families of migrant workers are inclined to invest in housing marker either by constructing a new house and enhancing the quality of the existing house.

3. REMITTANCES: TREND ANALYSIS

The annual inflows of remittances to Pakistan through the formal banking channel are reported regularly in the Economic Survey of Pakistan and State Bank of Pakistan's bulletins. Remittances transferred through informal channels such as HUNDI are not published and not included in the official figures. The actual value of funds remitted, therefore, is likely to be higher than the numbers reported by the SBP. Huge fluctuations were noted in the inflows of remittances. Furthermore, SBP is suggestive that the remittances have increased from US$ 4152 million in FY2005 to US$ 21739 in FY2019, showing an exponential increase in the last two decades (SBP, 2019).

Table 3 comprises a share of remittances concerning countries. It indicates that the share of remittances has increased from 7.1 percent in 2008 to 13.8 percent in 2018 from the UK with some deviation. Similarly, share increased from 19.4 percent in 2008 to 29.5 percent in 2013 from Saudi Arabia; however, it reached 24.8 percent in 2018. After that, UAE is estimated as the primary contributor to remittances whose share has increased from 16.9 percent in 2008 to 22.1 percent in 2018 consistent from the UAE; nonetheless, it remains around 16.2 percent in 2018 from other GCC countries. The USA is also contributing relatively in total remittances of Pakistan. During 2008, the highest share is estimated (27 percent); however, after that trend of share seems to decline, and it reaches up to 13.8 percent in 20018.

Table 3

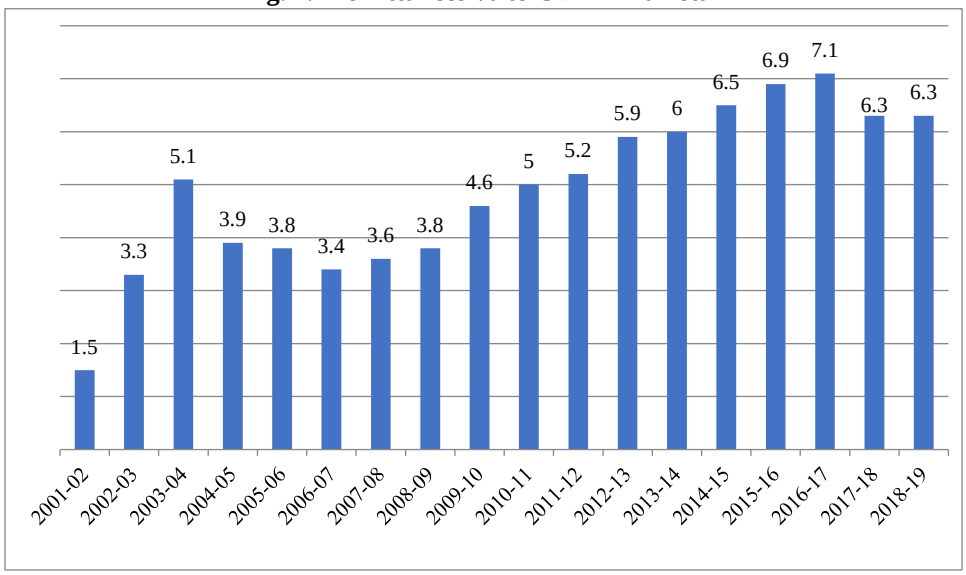
Trend in Share of Remittances (%): Country Wise

Country/Region	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total	100	100	100	100	100	100	100	100	100	100	100
USA	27.3	22.2	19.9	18.5	17.7	15.7	27.3	14.44	12.68	12.68	13.8
UK	7.1	7.8	9.8	10.7	11.5	14.0	7.1	12.69	12.95	12.10	14.1
Saudi Arabia	19.4	20.0	21.5	23.8	28.0	29.5	19.4	30.08	29.97	28.27	24.8
U.A.E.	16.9	21.6	22.9	23.2	21.6	19.8	16.9	22.61	21.92	22.37	22.1
GCC Country	15.2	15.4	13.9	11.7	11.3	11.5	15.2	12.88	14.45	14.70	16.2
EU Countries	2.7	3.2	2.8	3.2	2.8	2.6	2.70	2.70	2.90	3.28	2.72
Norway	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.15	0.18	0.21	0.20
Canada	1.6	1.0	1.3	1.6	1.3	1.3	1.6	0.42	0.47	0.49	0.70
Japan	0.1	0.1	0.1	0.1	0.1	0.1	0.10	0.04	0.07	0.07	0.1
Others Countries	8.2	7.8	6.5	5.8	4.3	4.1	8.2	7.06	8.73	10.83	12.8

Source: SBP (2017-18).

The contribution of remittances to (%) of GDP has increased over time. Figure 1 shows that during 2001-02, the share of remittances to GDP is estimated at 1.5 percent, however, and it reaches 5.1 percent during 2003-04. After that, again, it declines and remains in the band of 3 to 4 percent from 2004-2010. In subsequent periods, it indicates an increasing trend and is estimated 6.3 percent share to GDP during 2018-19.

Fig. 1. Remittances % to GDP in Pakistan



Source: (SBP, 2019).

3.1. Remittance-Sending Pakistani Workers

According to the Bureau of Emigration and Overseas Employment (BEOE), Pakistan has estimated 10 million Pakistan are working in different countries from 1971 to 2019. It further indicates that up to October 2019, 5394596 workers are working in Saudi Arabia, UAE (3841964), Oman (791390), Qatar (183505), Bahrain (171428), and while 183601 migrants are working Kuwait. Closely looking, these figures are suggesting that a large number of people are working in Middle East countries (Table 4). Subsequently, Malaysia (106652), South Korea (15487), Libya (81174), Iran (12879), Iraq (74624), Italy (28549), UK (13544), and Cyprus (7235) are countries where the number of Pakistani are working and sending remittances to the homeland. Some other countries are absorbing Pakistani workers. The other significantly hosting countries include Jordan, USA, Nigeria, South Africa, Turkmenistan, Spain, Yemen, Japan, Soudan, Tanzania, Algeria, China, and Brunei. These countries are hosing more than one thousand Pakistani workers. Table 4 shows that Gulf Countries are absorbing a significant portion of Pakistani labour. After that, European countries are also hosting a commendable number of Pakistani migrants who are sending remittances.

According to the Bureau of Emigration and Overseas Employment (BEOE), out of total labourer, 42.41 percent is unskilled labour, which does not have any significant skill when they are migrating out of Pakistan. Likewise, 42.51 percent of workers have some skills, but these skills belong to average occupations. Nonetheless, 9.2of 4 percent of people are having semi-skills that belong to elementary occupations. Moreover, only 3.83 percent population is containing high skills, and whereas approximately workers pertain to highly qualified skills such as doctors, IT specialists, and other professional skills (Figure 2).

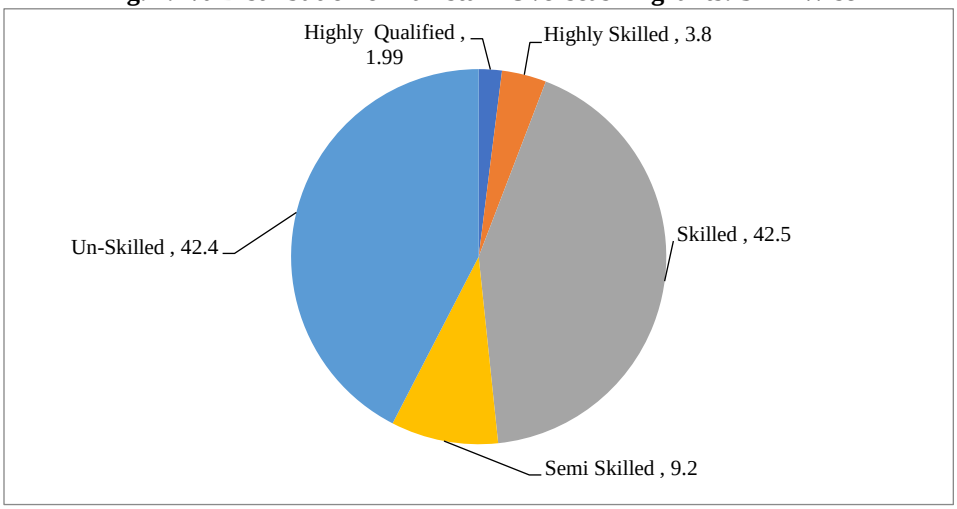
Table 4

Total Overseas Migrants from Pakistan (1971 to Oct, 2019); Country Wise

S.#	Countries	Total	S.#	Countries	Total
1	Saudi Arabia.	5394596	27	Jordan.	7693
2	U.A.E.	3841964	28	Kenya	165
3	Oman.	791390	29	Lebanon.	693
4	Qatar.	183505	30	Libya.	81174
5	Bahrain.	171428	31	Morocco..	55
6	Kuwait.	183601	32	Nigeria.	3685
7	South Korea.	15487	33	Sierra Leone	154
8	Malaysia.	106652	34	Singapore.	798
9	China.	5684	35	Somalia.	395
10	Algeria.	2189	36	South Africa.	2273
11	Angola.	714	37	Spain.	2414
12	Azerbaijan	257	38	Sudan.	6026
13	Brunei.	2026	39	Sweden.	573
14	Cameroon.	106	40	Switzerland	238
15	Croatia.	49	41	Syria	350
16	Cyprus.	7235	42	Tanzania.	1398
17	Gabon.	316	43	Tunisia.	51
18	Gen-Island.	199	44	Turkey.	684
19	Germany	733	45	Turkmenistan.	1224
20	Greece.	552	46	U.K.	13544
21	Guinea.	249	47	U.S.A.	5709
22	Hong Kong.	582	48	Uganda.	464
23	Iran.	12879	49	West Africa.	316
24	Iraq.	74624	50	Yemen.	5594
25	Italy.	28549	51	Zambia.	1082
26	Japan.	1515	52	Others	26390

Source: BEOE.

Fig. 2. % Distribution of Pakistani Overseas Migrants: Skill-Wise



Source: EOBE.

4. MODEL, DATA AND ESTIMATION METHODOLOGY

4.1. Theoretical Model

This study employs a basic utility maximisation approach to conceptualise the housing demand dynamics (Ahmad et al., 2018). Let individual $i's$ utility function in market j depends on two goods: (i) non-housing composite consumption denoted by C_{ij} and (ii) the number of housing units denoted by q_{ij}. It is also assumed that households have the same utility function. However, it differs by socio-demographic characteristics. These characteristics are signified by z_i. The vector z comprises information such as the age, gender, and education of household head, and social status. The utility function of the household can be written as follows:

$$U_{ij} = U(C_{ij} \quad q_{ij} \quad z_i) \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Let assume a static setting, an individual is to maximise the utility given the budget constraints. An individual chooses how to allocate his/her income to non-housing composite consumption (C_{ij}) and the housing services (q_{ij}). The budget constraint of an individual can be defined as follows:

$$C_{ij} + p_j q_{ij} = m_{ij} \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Where m is the household's income, p is the price of housing services and the price of non-housing consumption is normalised to one. Letting housing prices to be different across markets. Ahmed *et al.* (2018) have set the household's utility maximisation problem and by solving the budget constraint for C_{ij} and substituting into the utility function gives the indirect utility function. The budget constraint can be written as follows:

$$C_{ij} = m_{ij} - p_j q_{ij} \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

By applying mathematical operations, we obtain following indirect utility function

$$V_{ij} = \underset{q_{ij}}{\text{Max}}\, U(m_{ij} - p_j q_{ij}, \quad q_{ij,} \quad z_i) \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

By solving equation (4), we yield the (implicit) housing demand equation

$$p = \frac{\frac{\partial V}{\partial q_i}}{\frac{\partial V}{\partial m_i}} \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

Providing a specific form for the utility function (1) will give rise to an explicit housing demand equation.

4.2. Empirical Model

The housing demand depends on various factors such as housing prices, permanent income, transitory income, remittances, the gender of the head, family size, affordability, marital status, head education, employment status, and locational variables. This study aims at investigating the impacts of remittances on housing demand. Ahmed *et al.* (2018) have estimated the determinants of housing demand in Pakistan. The underlying paper weaves up remittances in the same model as Ahmed *et al.* (2018) has specified to trace out the determinants of housing demand.

The model is specified as follows.

$$q(z) = \beta_0 + \beta_1 A + \beta_2 y_p + \beta_3 y_t + \beta_4 R + \beta_5 P_h + \beta_6 E_d + \beta_7 F_s + \delta_1 G_h + \delta_2 M + \delta_3 C_l + \delta_4 C_M + \sum_{m=1}^{14} \delta_m Ct + e_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

In the above Equation (6), the dependent variable is standardise housing unit which is demanded by households; variable A stands for affordability, y_p=permanent income, y_t= transitory income, R= remittances, E_d= education of head, Fs=family size, G=gender of the head (male), C= represents if the city is low and middle income, whereas Ct= dummies of 14 big cities. The use of city-specific variable help to capture the regional disparities across Pakistan. Following the literature, the above model is estimated by using the Heckman Two-Step model (Ahmad et al., 2018; Nasir and Iqbal, 2009). Moreover, we assess impacts of remittances on tenure choice by using the Logit model and effects of remittances on housing quality by using a robust regression model to capture the impact of outliers in the model due to household income variables. Literature has shown that the Logit model produces robust results when the dependent variable is dummy (Arif et al. 2011; Iqbal and Awan, 2015; Nasir and Iqbal, 2009).

4.3. Data and Variable Construction

The study employs HIES household survey data for the year 2015-16, conducted by the Pakistan Bureau of Statistics (PBS)[1]. This round of survey comprises socioeconomic information of 24,238 households that contains the consumption module of households along with other socioeconomic information. Out of a total sample of HIES 2015-16, the urban area includes 16155 households while rural area encompasses 8083 households. The study focuses on the urban sample, particularly big cities such as Karachi, Lahore, Faisalabad, Rawalpindi, Quetta, Peshawar, Haider Abad, Multan, Sukhar, Gujranwala, and Islamabad. The main concern of the study is those households that are receiving remittances from abroad. This survey comprises 298 households that are receiving remittances. A dummy variable is constructed to capture migration status i.e., 1 is assigned to those households which are receiving remittances from abroad, 0 otherwise.

Prices of housing are estimated using the Hedonic Price Model to capture the locational effects of housing prices. Similarly, Permanent income and transitory income are also calculated by using household socioeconomic factors and sources of income. Thus, the permanent income measure represents the potential lifetime earnings, and regressing the real observed total income on the independent variables provides the permanent income as a fitted value of the regression and transitory income as residual. Congestion is measured by dividing the total number of rooms by family size, which determines capacious housing. For detail, tables of the definition of variables and their summary statistics are given in appendix-A1&A2, respectively.

5. RESULTS AND DISCUSSION

5.1. Impact of Remittances on Housing Demand: Standardised Housing Unit

The Heckman Two-Step model has been applied to estimate the effect of remittances on standardised housing units to gauge the relationship between remittances and housing

[1] The data is available at http://www.pbs.gov.pk/content/hies-hiics-2015-16-microdata

demand in Pakistan. The reason to use the Heckman model is to adjust the selectivity bias that emerges owing to tenure choice among the people, as observed by Ahmed et al. (2018). The estimated results also confirm the presence of selection bias in the model which is seen through the significance of Lamda (ʎ) or Inverse Mills Ratio (Table 5). This finding implies that the application of the Heckman model is justifiable; otherwise, estimated results would be biased. The selection models are presented in appendix-B1&B2, respectively.

Table 5 is further suggestive of the positive and significant impacts of remittances on housing demand. Here, remittance is in binary form, and results indicate that other things remain constant, remittances receiving households are demanding more housing as compared to those who do not have received remittances. The positive coefficient highlights that remit receiving households are demanding 21 percent more as compared to others.

Table 5

Impact of Remittances on Standardise Housing Unit in Cities of Pakistan

	(1)		(2)	
Variables	Coefficients	S.E	Coefficients	S.E
Permanent income	-0.05364	0.047	-0.050554	0.047
Transitory income	0.350496***	0.019	0.346648***	0.019
Housing price	0.15712***	0.041	0.157814***	0.041
Remittances	0.212905*	0.120	1.95e-06***	5.94e-07
Affordability	0.119357***	0.007	0.118433***	0.007
Age of household head	0.014035***	0.001	0.01396***	0.001
Gender head	-0.38409***	0.057	-0.38190***	0.058
Completed years education of head	0.050338***	0.003	0.049814***	0.003
Marital status (1=married, 0 otherwise)	0.131884***	0.047	0.136206***	0.047
Big city dummies	Yes		yes	
Constant	-0.88698	0.705	-.923048	0.705
Inverse Mills Ratio or Lamda (ʎ)	-0.7873925***	0.195	-0.824763***	0.196
Wald chi2(22)	1431.83***		1422.33***	
Total observations	16,155		16,155	
Censored obs.	4,405		4,405	
Uncensored obs	11,750		11,750	

Note: two models (1) & (2) stand for inclusion of remittance variable as binary and continuous variable respectively. Moreover, *, **, *** are indicating statistically significance at pr<0.10, pr<0.05, and pr<0.001 respectively, whereas standard errors are reduced to three decimal.

Moreover, the study also uses remittances as a continuous variable which is also indicating the positive and significant impacts on housing demand (model-1, table-5). These positive and significant impacts are indicative of the increase in housing demand owing to remittances. Intuitively, it seems plausible in the case of Pakistan. Remittances are the source of the big push for households that determine housing demand. As in previous sections, it is indicated the majority of the population is living in 1-2 room houses due to lack of affordability and higher prices of housing. Remittances work as an additional handsome amount, which enhances the buying power of households, and they invest more in house and quality of accommodation in big cities.

Moreover, enormous inflows of remittances from the Middle East and Europe put massive pressure on the housing market. New housing units are required to accommodate the population migrating to big cities. Our findings are more congruent with existing studies. The remittances sent by emigrants/immigrants increase the purchasing power of the households. With more resources, households increase spending on housing, as found by Gilani et al. (1981) & Arif (2009).

Permanent income and transitory income are also considered important determinants of housing demand as well. Ahmed et al. (2018) have found mixed impacts of both incomes on housing demand in Pakistan by using three waves of PSLM dataset. Likewise, this study explores the positive and significant effect of positive transitory income on housing demand; however, permanent income has insignificant impacts. These findings imply that a positive shock in income allows households to invest in housing requirements, which, as a result, determines an increase in housing demand in big cities.

Moreover, housing price also has significant impacts on housing demand. Household's affordability, which is estimated by the ratio of housing rent and household income, is even suggesting positive and significant effects on standardising housing units. The dummies of 14 big cities are used to control the heterogeneity among cities, and they are found statistically significant. Similarly, household head attributes are considered essential factors that cause impacts on housing demand. Completed years of schooling by the household head are indicating positive and significant determinants of housing units in Pakistan. In addition to this, marital status, age, and gender of the head are also appeared to be significant determinants of the housing unit.

5.2. Impact of Remittances on Congestion: Number of Rooms per Family Member

After discussing the impacts of remittances on housing demand, the study also explores the effects of remittances on congestion, which establishes the relationship between remittances and the number of rooms available per family member. To estimate the model, a robust regression technique is applied to neutralise the impacts of outliers in the model.

The estimated results are showing a positive and significant impact of remittances on solving the congestion problem in overall Pakistan. It implies that remittance-receiving households are more likely to have per capita room availability as compared to those who are not receiving remittances. The positive and significant impacts of remittances on per capita number of room availability are estimated for Punjab, KP, and Sindh provinces except for Balochistan province (Table 6). These findings seem quite intuitive because households use remittances in the expansion of rooms and other facilities. Again, permanent and transitory income and affordability also found having positive and significant impacts on congestion in housing. Likewise, locational dummies are also indicating substantial effects. At the same time, household head attributes such as education, gender, marital status, and age of head are also found, having significant impacts on the per capita number of room availability. Their effects vary across provinces (Table 6).

Table 6

Impact of Remittances on Congestion in Housing: Provincial Analysis

Congestion	Overall	KPK	Punjab	Sindh	Balochistan
Affordability	0.00400***	0.00303***	0.00285***	0.00846***	0.00530***
Remittances dummy	0.01608***	0.01635**	0.01777***	0.01968***	-0.00077
Permanent Income	0.01206***	0.00095	0.01304***	0.02454***	0.03017***
Transitory Income	0.00211***	0.00201	-0.00132	0.01264***	0.00322
House prices	0.18938***	0.19031***	0.20683***	0.16996***	0.18400***
Head age	0.00015***	0.00024**	0.00024***	0.00018***	-0.00038***
Gender head	-0.00114	-0.00234	0.00009	-0.00938***	-0.00083
Head education	-0.00033*	0.00027	-0.00052*	-0.00050	-0.00160***
Married	-0.00899***	-0.01056***	-0.00965***	-0.00449	-0.00046
Family size	-0.00815***	-0.00699***	-0.00966***	-0.00957***	-0.00628***
Low income city	0.07222***	0.04926***	0.08835***	0.05936***	0.10208***
Middle income city	0.05807***	0.04596***	0.06608***	0.04907***	0.07721***
Big cities dummies	Yes	Yes	Yes	Yes	Yes
_cons	-2.58344***	-2.47796***	-2.83111***	-2.43792***	-2.74919***

*Note:*** p<0.01, ** p<0.05, * p<0.1.

5.3. Remittances and Housing Tenure Choice

We further explore the relationship between remittances and tenure choice—whether remittances receiving households are expressing their choice to own housing or rent it out. Table 7 displays the statistically significant impacts of remittances on tenure choice. These impacts are negative, which indicates that remittance-taking families are less likely to own the house, and they prefer to live on rent. The findings are seemingly a bit surprising. The reason can be due to higher prices of housing in Pakistan. Households prefer to live on rent in quality-houses. It also indicates by findings of the positive impacts of remittances on reducing congestion (Table 6). Households are moving towards more substantial houses.

Affordability has a positive and significant impact on owning houses. Estimated results are showing that as the affordability of households increases, they are more likely to own houses. These impacts remain the same across the provinces as well (Table 7). Likewise, the permanent income also has positive and significant effects on tenure choice. Furthermore, the positive impacts remain the same across all provinces. The impact of permanent income is found congruent with the findings of Ahmed et al. (2018). Nonetheless, transitory income is found insignificant in all models except Punjab.

Housing prices are found statistically significant and having positive impacts on housing. Prices play an important role in determining the housing demand. Here, positive effects indicate that as prices increase, people are more likely to own houses, other things remaining the same. This relationship remains consistent when the sample is disaggregated into provinces. Table-7 is suggestive of positive and significant impacts of prices in all models.

Despite income and prices, other social variables such as gender of the head, education, and marital status of the head are also significant factors that determine the tenure choice. Estimated findings are showing that education of head is significantly affecting the tenure choice; however, gender and marital status are not many significant

factors that impact housing-tenure choice. Dummy variables of income group of the locality also have substantial effects. These influences are positive, which means other things remaining the same, people living in low and middle-income cities are more likely to own houses as compared to a high-income locality. Similarly, dummies of 14 big cities are also controlled, and they have significant impacts on housing-tenure-choice.

Table 7

Impact of Remittances on Tenure Choice in Big Cities

	Tenure Choice Pakistan	Tenure Choice KPK	Tenure Choice Punjab	Tenure Choice Sindh	Tenure Choice Balochistan
Affordability	0.0398***	0.0468	0.0288*	0.0725	0.0961**
Permanent income	0.2270***	0.1406	0.2661**	-0.0312	0.3928**
Transitory income	-0.0433	0.0422	-0.1055**	-0.0295	-0.0622
House prices	0.9958***	0.9851***	1.0438***	1.4785***	1.0403***
Remit (1=yes)	-1.2046***	-1.3750***	-1.0304***	-1.1678***	-1.2663***
Gender head (1=male)	-0.0707	-0.2251	0.1140	-0.3106	-2.6267**
Head education	-0.0144***	-0.0176	-0.0236***	0.0138	-0.0206*
Married (1= yes)	-0.1025	-0.2143**	-0.0437	-0.0010	0.0310
Low income (city)	0.7526***	0.3455	0.7279***	0.9100***	0.5475
Middle income (city)	0.6923***	0.8403***	0.5015***	0.6976***	1.5845***
Big city dummies	yes	yes	yes	Yes	yes
_cons	-15.743***	-14.4465***	-17.0408***	-18.635***	-16.25***
Number of obs.	16,155	3,322	7,181	3,912	1,740
Wald chi2	1039.49***	191.90	489.63	265.74***	141.78***
Pseudo R2	0.0592	0.0493	0.0637	0.0763	0.0759

*Note:*** p<0.01, ** p<0.05, * p<0.1.

6. CONCLUSION AND POLICY IMPLICATIONS

Housing is one of the most basic human needs. Millions of people all over the world are struggling to have quality housing. For the past several years, Pakistan has been faced with housing issues both in qualitative and quantitative terms. The problems concerning housing are more severe in urbanised Pakistan. Multiplication of the urban population through rural to the urban movement for varied opportunities and a better standard of living has been the primary source of the problem. This study aimed to investigate the impact of remittances on housing demand in Pakistan. For empirical analysis, HIES survey data is used. We determined house prices by employing the hedonic price model. The log-linear model was estimated using the OLS technique. To estimate empirical analysis, the Heckman Two-Step model is applied due to the presence of selection bias, which occurs owing to tenure choice. Moreover, the relationship between tenure choice and remittances is also estimated by using the Logit model.

We have found that remittances have a positive and significant impact on housing demand. The apparent reason emerges the crunch in the housing market because of the global financial crisis. These results indicate that rapidly rising migration has enormous implications for the housing sector. A considerable inflow of remittances from the Middle East and Europe put massive pressure on the housing market. New housing units are required to accommodate the population migrating to big cities.

Despite housing demand, the study estimates the impacts of remittances on per person's number of room availability. For the empirical purpose, a robust regression technique is applied to neutralise the effects of outliers, emerge through the presence of household income-related variables. The findings are indicative of positive and significant impacts on it. Those households which are receiving remittances are more likely to have a capacious house—an increase in the number of rooms per person in a family. The analysis is further extended to the province level. Nonetheless, positive and significant impacts remain consistent across the four provinces. Those households which are receiving remittances are less likely to own houses, and they are more bent towards renting the houses.

Two implications emerge from this analysis. On the one hand, remittances facilitate overcoming the housing deficit and, on the other hand, can lead to more congestions in large cities. The government should encourage overseas Pakistanis to invest in new housing schemes launched by the Pakistani government to meet the housing demand for low and middle-income groups. To overcome housing needs, there is a need to revisit the institutional framework and policy mix to attract investment, especially for overseas Pakistani. Literature has shown that institutional bottlenecks may hinder the investment (Iqbal and Daly, 2014; Nawaz and Khawaja, 2019). The government should design policies to facilitate migrant workers to invest in government housing schemes.

APPENDIX-A1

Definition of Variables

Variables	Description
Standardised housing unit	Owner-cum value divided by housing price per unit
Permanent Income	Predicted income from a robust regression model
Transitory Income	Residual of the permanent income model
Remittances amount	Total remittance was the sum of domestic and foreign remittance
Remittance binary	Takes value 1 for remittance, 0 otherwise
Market Value of House	Price of owner-occupied housing unit
Low-income Group	Low-income group (as identified under PSU)
Middle-income Group	Middle-income group (as identified under PSU)
High-income Group	High-income group (as identified under PSU)
Affordability	Affordability was defined as Rent to Income Ratio
Household Head's Age	Age of household head in the year
Household Head's Education	Education of household head in the year
Gender	= 1 if Male; = 0 if female
Marital Status	= 1 if married; = 0 otherwise
Occupation	Post currently working on
Employment Status	= 1 if employed; = 0 otherwise
Industry	Industry in which households head was working
Number of Earners	Number of earners in a household
Family Size	Number of members in a household
Owner Occupied House	= 1 if owner-occupied, = 1 otherwise
Imputed rent	imputed rent was used for the missing values of house rent
Type of roof	It refers to the material used in roof
Type of walls	It refers to the material used in making walls
Water Facility	water availability in house, piped, motor water or other
City	urban cities are chosen for analysis

APPENDIX-A2

Summary statistics

Variables	observation	Mean	S.D	Min	max
Head age	16,155	46.45262	12.90694	11	99
Head education (years)	16,155	6.898607	5.26475	0	18
Remit value (rupees)	16,155	3128.01	47026.58	0	3600000
Number of earners	16,155	1.6645	1.1755	0	13
Total rooms	16,155	2.575611	1.448475	1	34
Family size	16,155	15.59759	7.835575	3	157
congestion	16,155	0.196586	0.145825	0.009709	2
Yearly income	16,155	797026.5	992877.6	3000	5.56E+07
Permanent income	16,155	642306.1	278585.2	-323750	2867741
Transitory income	16,155	-0.19192	0.905423	-5.30018	4.040948
Housing price	16,155	14.60228	0.436116	12.98623	16.34462
Standardise housing	16,155	1.254942	1.298423	0.006726	63.1612
Imputed rent	16,155	93761.07	111639.9	1200	3600000
Affordability	16,155	0.489159	2.236688	0.00122	92.85051

APPENDIX-B1

Selection Model of Heckman Two-step Model (Standardise housing)

Selection Variable: Tenure Choice	Coef.	Std. Err.	z	P>z
affordability	0.048007	0.008844	5.43	0.000
Transitory income	0.052901	0.01683	3.14	0.002
Gender head	-0.10059	0.047737	-2.11	0.035
Head education years	0.007095	0.002094	3.39	0.001
d_married2	-0.04409	0.039006	-1.13	0.258
d_big_city1	-0.53142	0.041925	-12.68	0.000
d_big_city2	-0.80153	0.068634	-11.68	0.000
d_big_city3	-0.05721	0.122366	-0.47	0.640
d_big_city4	0.045268	0.059143	0.77	0.444
d_big_city5	0.282109	0.085808	3.29	0.001
d_big_city6	-0.00336	0.139128	-0.02	0.981
d_big_city7	-0.37641	0.038028	-9.9	0.000
d_big_city8	0.080128	0.078355	1.02	0.306
d_big_city9	0.266098	0.129576	2.05	0.040
d_big_city10	-0.21998	0.169072	-1.3	0.193
d_big_city11	0.268588	0.08992	2.99	0.003
d_big_city12	-0.4702	0.059548	-7.9	0.000
d_big_city13	-0.59577	0.09016	-6.61	0.000
d_big_city14	-0.47787	0.058747	-8.13	0.000
d_big_city15	-0.28495	0.05452	-5.23	0.000
d_big_city16	-0.38237	0.054777	-6.98	0.000
d_big_city17	-0.56764	0.051502	-11.02	0.000
d_big_city18	-0.94885	0.098789	-9.6	0.000
_cons	0.863904	0.047502	18.19	0.000

APPENDIX-B2

Selection Model of Heckman Two-step Model (Standardise housing)

Sample selection: tenure choice	Coef.	Std. Err.	z	P>z
affordability	0.049443	0.008893	5.56	0.000
tr_inc	0.05901	0.016873	3.5	0.000
gender_head	-0.0977	0.047764	-2.05	0.041
head_education_years	0.007785	0.002099	3.71	0.000
remit_value	-2.17E-06	3.38E-07	-6.41	0.000
d_married2	-0.05724	0.039202	-1.46	0.144
d_big_city1	-0.53198	0.041939	-12.68	0.000
d_big_city2	-0.8018	0.068801	-11.65	0.000
d_big_city3	-0.05501	0.122319	-0.45	0.653
d_big_city4	0.038245	0.05916	0.65	0.518
d_big_city5	0.276083	0.085828	3.22	0.001
d_big_city6	-0.00946	0.139261	-0.07	0.946
d_big_city7	-0.37148	0.038122	-9.74	0.000
d_big_city8	0.074101	0.078354	0.95	0.344
d_big_city9	0.268149	0.129667	2.07	0.039
d_big_city10	-0.22735	0.16906	-1.34	0.179
d_big_city11	0.259664	0.089944	2.89	0.004
d_big_city12	-0.47524	0.059576	-7.98	0.000
d_big_city13	-0.57602	0.090827	-6.34	0.000
d_big_city14	-0.4775	0.058794	-8.12	0.000
d_big_city15	-0.28592	0.05456	-5.24	0.000
d_big_city16	-0.39039	0.054809	-7.12	0.000
d_big_city17	-0.57002	0.051558	-11.06	0.000
d_big_city18	-0.91737	0.099461	-9.22	0.000
_cons	0.875926	0.047604	18.4	0.000

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