Effects of Demographic and Macroeconomic Variables on Housing Demand in Pakistan

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A thesis submitted in the partial fulfillment of

The requirements for the degree of

Master of Philosophy in Economics

Faculty of Management Sciences

NATIONAL UNIVERSITY OF MODERN LANGUAGES

ISLAMABAD

2021

NATIONAL UNIVERISTY OF MODERN LANGUAGE, ISLAMABAD

FACULTY OF MANAGEMENT SCIENCES

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Master of Philosophy
Degree Name

Economics
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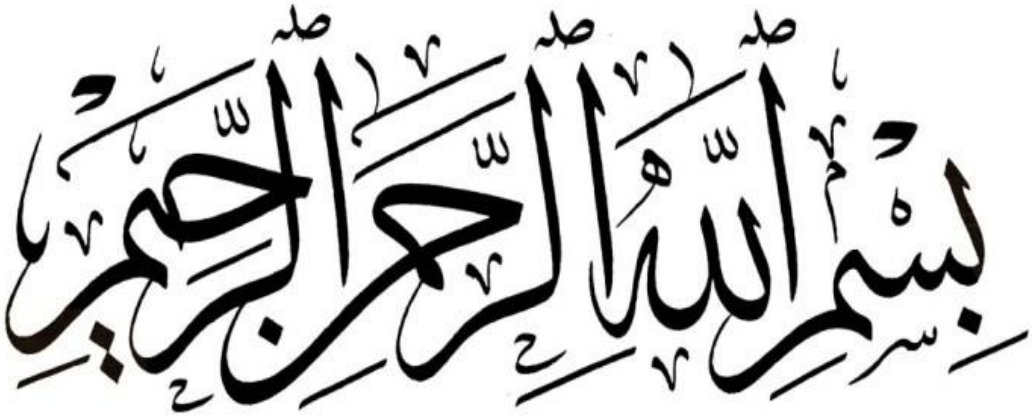

"In the Name of Allah, the most Beneficent, the most Merciful"

DEDICATION

I DEDICATE THIS HUMBLE EFFORT TO
MY PARENTS, NAEEM AKHTAR & FARZANA NAEEM,
WHO TAUGHT ME THAT IT'S NEVER TOO LATE TO TRY
FOR ACHIEVING YOUR GOALS.

ACKNOWLEDGEMENTS

Throughout the writing of this dissertation, I have received a great deal of support and assistance. For that, first of all, I would like to humbly thank **Allah the Merciful and Beneficent,** who bestowed His many blessings on mankind, certainly one of which is knowledge a new distinction for mankind. I express my gratitude to the **Holy Prophet Muhammad ﷺ,** who preached us to seek knowledge for enhancement of mankind specifically in addition to other creatures in basic.

Then, I would like to thank my supervisors, **Dr. Sabahat Subhan and Mr. Shafqut Ullah** (Department of Economics, National University of Modern Languages), whose expertise was invaluable in formulating the research questions and quantification of blue economy. Their timely and insightful feedback pushed me to sharpen my thinking and brought my work to a higher level. I want to thank you for your patient support, professional advice, continuous encouragement and successful criticism throughout the completion of this thesis.

In addition, I would like to thank my parents for their wise counsel and sympathetic ear. You guys provided me with the tool that I needed to choose the right direction and successfully completed my dissertation. Thank You for always being there for me. Finally, I could not have completed this dissertation without the support of my siblings and friends, who provided stimulating discussions as well as happy distractions to rest my mind outside of my research.

HAFSA

NAEEM

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Abstract

Housing is the most important and durable asset for any household. It is an essential need of humans. Housing demand is derived demand from leisure demand. The main objective of this study is to investigate the effect of demographic and macroeconomic variables on housing demand in case study of Pakistan. For this purpose, study uses time series data from 1980 to 2019. This study uses housing demand as a dependent variable and three age brackets for demographics variables (Agebracket1, Agebracket2 and Agebracket3), per capita real GDP, male unemployment rate and inflation rate are used as independent variables. As study uses time series data, so checking the stationarity for all variables through unit root tests is a prerequisite condition for robust findings and PP tests of unit root are applied and result shows a mixed order of integration of variables. On the basis of unit roots tests, study estimates the model through ARDL bound testing approach of cointegration. In the short run Agebracket1, Agebracket3, male unemployment rate and inflation rate have positive effects on housing demand. While real GDP per capita and Agebracket2 have negative impacts on housing demand. It is because in short run the positive effect of income is not properly channelized in the form of demand for durable goods. In the long run Agebracket1, Agebracket3, real GDP per capita, male unemployment rate and inflation rate shows significant impact on housing demand. The Agebracket2 and inflation rate shows negative impact on housing demand but the agebracket2 is not statically significant. Lastly, CUSUM and CUSUMSQ are also used to confirm the stability. The government should provide the facilities in form of inflation control, job opportunities, and cheap credit facilities to boost the housing demand. It is because at macro level housing demand matters for sustainable growth of economy.

Keywords: Housing Demand (HD), Demographics Factors, ARDL, ECM, ADF, PP.

CHAPTER 01

INTRODUCTION

1.1 Introduction

There is bidirectional causality between housing demand and economic growth. Generally, housing as a sector accounts for 10 to 20 percent share in total economic activity of any economy (Müller, 2005). The concept of residential investment or investment in housing is the money that households spends either on the purchase of newly built houses for living or do expenditure for the improvements of house (Huang, 2015). If we talk about the role of housing sector at macro level, then this sector plays a leading role in the business cycle fluctuations. For example, in Japan, during the recession periods, public housing activities are used to stimulate output and create employment. The United States, Thailand, and Singapore also use similar strategies in the past (Arku, 2006).

The value of housing for man remains an unquestionable fact. Housing is a second to food and even some suggest, if you give us house then we will take care of food (Sustainable Cities Program, Egypt, 2003). House for a person is an essential need just like food and cloth for human survival (Okafor, 2016). Availability of house at affordable price is a good measure of economic and living status of a society. According to Karamujic (2015), housing is a crucial factor for the economic and social progress. While access demand or less supply of housing is a world-wide issue. Housing requires attractive land areas and other related facilities to make it comfortable and esthetically good looking otherwise it affects the productivity of household (Festus & Amos, 2015).

The need for accommodation is not only one of the basic human features, but also a measure of the population's living standards. It is a topical issue today that housing needs to be convenient, economical and relatively safe, as well as architecturally expressive and environmentally friendly (Henilane, 2016). For statistical purposes, the Central Statistical Bureau (CSB) describes the concept of "housing (housing unit)" as a separate and independent place of residence, intended for one household or place of residence, not intended for living, but used as a permanent residence by the household during the census.

The rapid aging of both developing and developed economies is one of the dangerous economic disasters in coming decades. As Alvin Harvey Hansen[1] discuss the importance of age of population in his famous presidential address to the American Economic Association (AEA) in 1938. In this speech he describes demographic change as first headwind for slowing down economic growth in the developed World as an older population would decrease labor participation and productivity Hansen, (1939). On other hand, developing countries with high growth of population also suffer from these economic problems. Developing countries have also begin to consider the nexus between population and housing as an important economic issue. Like Malpezzi & Mayo (1987) empirically investigate this issue for Cairo, Shefer (1990) does for Indonesian economy by using household data, Arimah (1992) for Nigeria, Tiwari & Parikh (1998) analyze for India and Ballesteros (2002) discuss for Philippines. These empirical studies have attempted to assess income and price elasticity, which has a direct impact on the development of housing policies. The influence of the demographic system and population size makes sense because the demand for individual housing varies with age, both in terms of quality and quantity (Colas & Modenes, 2014).

The size and composition of the world's population has experienced a dramatic change over the past century. The world population increased from 1.6 billion to 2.5 billion people between 1900 and 1950. It has more than tripled over the next five decades, reaching 6 billion by the end of the twentieth century, and is projected to reach 9.3 billion by 2050 (UN, 2004). The aging process has taken place in a variety of developing countries as well as in developed countries.

1.2 Situational analysis of Pakistan

Pakistan is a developing country which accommodates world's sixth largest population. The housing conditions has remained under pressure because of industrialization, high population growth, high interest rate, low credit facility and for specific group and rising per capita income. Population growth, demographic factors and economic development have formed huge housing backlog, especially in urban sectors.

1.2.1 Historical Background

Pakistan is a federation that contain four provinces which are bordered by Afghanistan, China, India, and Iran, located in the region of South Asia. The coastline is situated along the Arab Sea

[1] Alvin Harvey Hansen is also called as "the American Keynes". He was a professor of economics at Harvard.

and the Oman Gulf. Sindh, Punjab, Khyber Pakhtunkhwa and Baluchistan are four provinces of the country. After British India's partition, Pakistan came into being in 1947. The state has an elected national assembly, the parliament's lower house, and a senate, the upper house. In addition, there is an elected provincial assembly in each province. The district-level local government was mostly subordinate to the provincial bureaucracy (Hasan & Arif, 2018).

Pakistan was the 14th most populated country in the world at the time of independence. In 1950s total population of Pakistan was about 36.94 million. But later, in the beginning of the 21st century, Pakistan is ranked as sixth most populated country in the world. We can observe outstanding population growth rate of Pakistan in previous seventy years. The main reasons of high population growth rate are, improving life expectancy rate, low rate of mortality rate, and high fertility rate or high per woman children. Life expectancy rate increased from the age of 43 years to 61 years from 1950 to 2000. Although, the total fertility rate not ever dropped below 5 children per woman. In 2007, both population growth rate and fertility rate were decrease. According to UN population projections, by 2050, Pakistan will be the world's fourth most populated country with a total population of 292.22 million (UN, 2007).

According to Pakistan's Population and Housing Census of 1998, approximately 15.6 million household have their own home or 80.8 percent of total population have housing units. Secondly, house was on lease at 1.7 million or 9.0 percent recorded. Another rent-free housing was calculated at 2.0 million or 10.2 percent in economy. In case of rural homeownership unit was less than in urban houses. Furthermore, rent free housing was less than in urban houses. For rural areas, the proportion of owned housing units was lower than in urban areas. Similarly, in rural areas, the proportion of rent-free houses was lower than in urban areas. The number of rented houses in urban sector, was showed significantly higher value 23.2 comparatively in rural areas 2.3% as recorded.

In urban sector household, 21% total spending paid on housing rent and 7 % spending recorded as on gas and electricity of houses. Similarly, the proportion of food consumption was showed 41 percent in Pakistan case. In urban sector, consumer spend their income by 62 percent on food consumption and housing. Besides this, less amount was spent on their health, education, clothes, leisure and other needs. Another side poorest family, the condition was much worse. According to Arif & Ibrahim, (1999) study examined that only one million population was lived in those cities i.e., in Faisalabad, Lahore and Karachi in 1981 period. But during the period 1998 these number

was raised into seven major cities of Pakistan such as Rawalpindi, Gujranwala, Lahore, Faisalabad, Multan, Hyderabad and Karachi. Between 1981 to 1998 period, these cities were showed a high population rate at 3.3 percent or 27 percent of the urban population in small and medium-sized cities.

During the growth in population increased, in 2005 natural disasters earth quake which resulted the main reason of housing shortage in Pakistan. Similarly, 600,000 houses were destroyed. At that time nine district of Azad Jummu and Kashmir 84 percent and 36 percent in Khyber Pakhtunkhwa was affected very badly or damaged. Additionally, in rural areas almost 90 percent houses were damaged. Another time of natural disasters such as flood which Pakistan faced consecutive several years by 2010 to 2013. According to 2010-time flood was too unprecedented because 1.6 million housing unit destroyed. During the period 2011 flood disaster has been 23 districts were affected in Baluchistan and Sindh areas accounted for 1.5 million completely damaged. In 2012, after huge flood almost five million population was affected in Punjab, Sindh and Balochistan housing destroyed. Moreover, in 2003 floods 1.4 million with number of 76,450 housing sectors was totally damaged. Subsequently the earthquake housing problem was raised in northern areas of country. Because most of the areas were severe damaged. According to record half a million houses were destroyed. Although in 2015 Pakistan needs almost 700,000 units of housing per year. Besides this, in urban areas 350,000 housing units was required. At same time period, 3,00,000 constructed housing units was estimated (Aamir et al., 2015).

According to Dowall & Ellis, (2009) examined in the largest cities of Punjab's population from 1981 to 2005. In 2005, these large cities were showed higher population i.e. 13 million estimated. In Lahore city which has increased population by accounted for 344,000 per year. Besides this, rapidly increase in population growth in Punjab sectors which indicates that urban residents unprecedented showed challenges for urban's land, infrastructure and housing market. Although economic development at that indicates improvement in the different sectors of housing demand, such as commercial, industrial areas. These efficiencies attract the foreign and also domestic direct investments which increase by the main factor to economic development.

In April 2011, the Census Department conducted a Housing Survey in partnership with the Federal Directorate of Education and Local Administration. By this showed the Islamabad city population was as high as two million, while the estimate in the 1998 Census report was low as around

800,000. This demographic boom immediately resulted in a dramatic increase in demand for housing. Migration from rural to urban sectors was ever-increasing urban demand is due not only to population growth, and in terms of socio-political aspects that affect housing development problems in Pakistan. One important aspect of these factors was the element of criminal activity in some major parts of the country, including suicide bombing, shot killing, etc. Behind the reason was that increase in the housing demand in capital of country; there were two types of settlers are located in to Islamabad: first, those fed up with unprecedented terror and security concerns in the KP, tribal areas and Baluchistan. Secondly, a huge workforce came from central Punjab to get a job.

In the city of Karachi, the case was the opposite. Because life security was showed worse day by day, well standard people moved, but other than the low-income group living in slums or informal conditions so, they had no further choice. Additionally, household size in such slums were too high as more than five children can be found in most households. There were number of reasons that independently work and interdependently located in urban land and housing markets which force poor people to live in inappropriate living conditions. The land supply was limited by: widespread land ownership, insufficient provision of trunk infrastructure to developable sites, ineffective and inefficient land use policies, weak registration process and tax distortions (Dowall & Ellis, 2009). So, all these factors make land much more expensive and complex because of the low-income group that makes the dream of good living as impossible to achieve.

1.2.2 Overview of Policies in Different Political Regimes

Rizvi, (2018) argued on Pakistan's government has been ignored the housing sector from several years. If all are implemented and gave attention according to their policies so, it can be seen improvement or growth in housing sectors. According to Zulfiqar Ali Bhutto was focused on Rotti, Kapraa and Maakan.Additionaly, in political period of Muhammad Khan Junejo also made interest on Shelters for Shelter less. After this, one million houses were announced. Furthermore, during the period of Yousaf Raza Gillani was also announced 5 million houses. Moreover, Nawaz Shareef politics period 5 lacks unit was announced. But housing issues were not moved or improved by all politician's policies in Pakistan. Unfortunately, in rural sectors two-third population lives those are living in mostly mud-houses or kutcha houses. According to 2018 period people lives in town and urban sector about 40 percent respectively. Because previous government's plan on housing

issues were not address appropriately in both pre-urban and rural areas. Another side, people who lives in urban large sector such as Faisalabad, Lahore, Karachi and Peshawar cities which are located on Kutchi Abadies or slum areas. Besides, low-income people are also lived-in indecent houses. According to 2018 survey, Pakistan faced 11 to 12 million housing backlogs and around 32 million families lived in without shelter and with too much poor housing conditions. In urban sectors 4 million housing shortage was estimated, whereas pre-urban and rural backlog housing 7 to 8 million was intended. According to population census such as 200 million, with increase in population growth round about 2.0 percent and house-hold size was 6.5 person per households estimated. According to PTI 's housing policy is considered on both rural and urban sector was need housing accounted for 10 lacs units per year and 50 lacs housing units in 5 years respectively. Besides this, quantity was divided into different sectors such as 4 lacs units in rural, 4 lacs in units in urban housing and also remaining part build on pre-urban areas has 2 lacs units per year intended.

Aamir et al., (2015) investigate regime of PPP government policies was focused on low-cost plots to poor people (1971). They offered improvement in slum areas not removed the kutcha Abadies. Although land acquired for low-income housing unit's scheme. Similarly, presented the projects named Awami Rehaishi Tanzim (ART) for civic residential organizations. During the period between 1978 to 1986 government was built almost 1.5 million housing units that was accomplished at the end of seventh five-year plan for development (1989 to 1993). In this research examined the deficiencies in housing policies and laws. In urbanization the housing level was estimated as 36.2 during the period 2011, although 21.7 million houses intended as compared to the population of 186 million respectively. In 2015, Pakistan has been faced accounted for 9 million shortage in residential area and it increased by 600,000 units annually. Productivity and construction housing activity has been increased by low level at 1 percent of GDP estimated as compared to developed and developing countries. The urban sector faced challenges with inappropriate housing conditions during the migration population since 1960s. Although, 186 million population of urban areas and it established accounted for 36.2 percent with increasing rate of 2.6 percent per year. The result of urbanization was rapidly grown in urban sector which cause of overcrowding in cities. According to National Housing policy, housing demand was 570,000 housing units whereas supply unit of housing accounted for 300,000 and also shortfall 270,000 housing units as recorded per year. At the same time period, in the urban area's population was 35

to 40 percent lived in informal resident conditions. In 1951 Pakistan population was 32,5 million, with the passage of time growth of population was increased by 184.5 million during the period of 2012 to 2013. According to 2014 census the population was 186 million with 1.49 percent was estimated as growth of population rate. Besides this increasing rate the population growth will be 121 million predictable in 2030 year and resulted in urbanization was 45.6% was show highest in the South East Asian countries. In the start of 2014, the population growth increased by 186,703 resulted.

Tariq, (2018) argued the period of 2001, Pakistan acquired almost 55 years in presenting the housing policy. After time period Pakistan had not put forward any new or studied policy in 16 years. Though housing is basic need for residents of population this was the common opinion of Pakistan. But the government was not efficiently work dealing the problems associated with housing sector. Housing shortfall magnitude was higher with the increase rate as compared to growth of population. The formation of country's housing standard was based on index of 'average number of persons per room. It explained that raised housing units with the percentage of stable flow in terms of average number of persons per-room on national and local scale. In 1998, there were 19.3 million housing units as per result calculated. All of these 32.3 percent houses were situated in the urban sectors. In the rural sector the amount as 67.7% house was estimated respectively. Similarly, Pakistan’s need 300,00 housing units as per year due to less production of housing. Housing backlog within 4.3 million units was resulted at censes respectively. Housing shortfall was increased by 270,000 as per year. According to 2017 period of census, 19,211,738 units was prevailed on housing stock. Housing back log was round about 9 million housing units calculated.

The present prime minister Imran Khan declared the Naya Pakistan Housing Program (NPHP) in 2018. According to this program main goal was to increase the accessibility of affordable housing which figures out by SBP. Furthermore, both NPHP and SBP policies were found as not only for low-income residents but those population which have not their own houses and want to live as independent housing unit in country. The application from NHPH was offered to borrower’s mortgage installment paid at 20,000 rupees per month. Thus, population has 60,000 rupees low - income per month those afford 33 percent value of mortgage in terms of sustainable level. Similarly, NHPH and SBP both offered the 8.50 percent interest per annum on housing mortgage.

According to time period at least 20 years in NHPH and SBP stands at 12.5 years of mortgage repayment for housing finance. Government of Pakistan intentions to enable the construction almost five million units with an average price 3 million rupees in the next coming five years. Additionally, government housing scheme is that round about 2,000,000 units will be built by NHPH. Another, remaining quantity of housing scheme will be built by open market which helped by the reorganization process that show the boost in economy activity of Pakistan.

In Pakistan, one-third total population was lived in urban sectors and it predictable to increase the number of housing accounted for 50 percent in 2050 year. These all three sectors have low, and lower- middle income segments lived population that areas. According to housing finance part which is very unsatisfactory because relatively associated with regional and globally, Pakistan's position stands at the bottom side at mortgage Debt to GDP ratio. Another side, Pakistan less than 1 percent in mortgage debt estimated as compared to other countries, because this ratio was declined by last decades. According to present PTI's policy plan is borrowers have facility to pay not more than 30 percent at time of down payment and borrowers pay for housing with in three instalments. Furthermore, the down payment should be limited accounted for 10 percent in deserving case for pay the value of housing property.

1.2.3 Global Situation of Housing

The household characteristics discussed in global scenario provide ample matter for the economic development for decision making related to housing. The factors affecting to housing demand discussed by a majority of the researchers are mainly income, price, taste and preferences. Owing to difference in social, economic and demographic features such as age, gender, consumption pattern, marital status and taste the demand for housing consumption differs. Furthermore, the difference in demand was also based on household source and level of income as well as their current and permanent income (wealth). Overall focus on savings for their future needs such as higher education of their children, marriages and constructing a house.

The housing demand across sections such as examined the global situation is very important. This section also analyses the demand for housing in the long run with the development of the market. In several previous studies housing demand was considered as a large part of consumption. Acoording to Mankiw & Weil, (1989) in US case, the main cause of real housing prices increased in 1970s because one percent increase in housing demand that the influenced to five percent

increase in the real price of housing. The large part of the demand for housing was made-up of those between the ages of 20 and 30 and after age 30 it showed flat result. Another during the period of 1990s aging was acting as a negative shock for housing demand and also observed single household formation was slower to demand for housing (Dipasquale & Wheaton, 1994).

Different aspects for housing demand in United States of America (USA) which found a negative impact of age and race on rented house, black people have less demand for housing then whites (Goodman, 1990). Additionally, demand for housing in Japan was rapidly drop after 65 age (Ohtake & Shintani, 1996). Similarly analyzed in Tiwari, (2000) housing demand in Tokyo presented the share of age of head for single family as home ownership was high than multi-family. Hence, Household increased in the form of home ownership was raised in Japan. Seko et al., (2001)in case of Japan home ownership was greater than Germany. In Canada case, 25-54 age groups showed the highest impact on the demand for housing from 1958 to 1997 reported by (Leclerc & Fortin, 2000).

Housing development in the market is a source of creating employment in the related input markets such as, real-estate, building material providers, sanitation services, labor market, water services and electricity. According to Helmenstein et al., (2001) unemployment rate was used as a cost shifter which showed statistically significant because during the unemployed people had more leisure time to more build houses in Austrian. Lindh & Malmberg, (2008) investigated on Sweden's young adult groups got large demand for housing middle age group 50 to 64 years age groups were observed peak income and net saver in society. But these age group showed negative effect because their investment portfolio was shift from real to financial asset. Moreover, in case of 70 above age group there was statistically insignificant because of ill health. Choi & Painter, (2015) highlighted the situation in the long run permanent increase in the unemployment rate was not affected on housing formation.

There are several macroeconomic variables which influence on housing demand. According to Adams & Füss, (2010) highlighted the macroeconomic determinants of international housing markets for 15 developed countries which highlighted the interest rate in the long term was made an attractive for residential investment in countries. For this, 1 percent increased in economic activity then the housing demand was raised. Similarly, the long run real income raised then the households invest on housing demand in UK which presented by (Chandler & Disney, 2014). In

According to OECD nations Monnet & Wolf, (2017) highlighted the sparking age group is 20-49 years that is sole factor to determine the housing investment. Moreover, inverse relation between age group of 50 plus in residential investment.

Fontenla & Gonzalez, (2009) highlighted the situation in developed countries that showed price elasticity of housing demand was lower as compared to developing countries. Arku, (2006) summarized on housing and economic development in economic in developing countries. Since the dispute began in the early 1950s, the partnership between housing and economic development began. Initially opposed to investment in housing, international institutions such as the World Bank changed their stance in the late 1960s and 1970s and became strong believed for housing as an economic development tool. While there is tremendous growth in many urban areas, housing is still being treated as a passive factor of economic development. This insufficient funding has worsened many cities unsafe and inadequate housing conditions and has severely compromised strategies for economic development.

Housing demand in developing countries was facing a huge gap between housing demand and supply. In developing countries, the housing demand main focused such as age, material status, gender, number of dependents and amount of permanent and temporary income. According to Ingram, (1984) presented the income elasticities in Colombian were higher than US while price elasticities of Colombian showed lower. Family size and age of head in Colombia was slightly similar to Korean country. In Hong Kong, during the 1961 to 1980 generation focused on quality of life and 1981 and 1995 generation was considered on homeownership Yusof et al., (2018) reported the increase in demand of home ownership by the citizen, thus cause the housing price higher in Malaysia. The comparison between China and USA investigated by Hongyu, (2002) which presented in the case of China, housing investment in GDP was much higher than the USA. It reflected the fact that the housing sector of China performed well. It showed that housing investment was an important indicator for short run economic growth.

Furthermore, demographic and dependency ratio is also main determinant for housing demand. According to Vajiranivesa, (2008) age bracket of 55-59 and above has negative effect on housing demand in Bangkok Metropolitan Region (Thailand). Similarly, in Turkey case during the age of 31 to 49 they had more motives for children occupancy than owner occupancy. But age of 51 and above showed more motives children's occupancy. Because in this stage they had more tendency

for children future demand for housing (Oktay et al., 2014). Another study on Turkey Solak & Kabadayi, (2016) highlighted the during the recovery period of country housing demand was increased more than income level. Jin, (2018) defined through income factor child dependency rate was negative effect on housing demand. On the other hand, through savings in old age dependency rate showed positive effect on housing demand in 38 regions of Chongqing. Similarly, case in 32 cities of China showed the population aging from 25 to 34 in urban areas had significant effect such as working age population on housing demand (Wei, 2018).

1.2.4Housing Market and Population Demand for Housing

Housing shortages and large increases in housing prices generate housing inadequacy. Many citizens in Pakistan suffer from housing inadequacy even after allocating much of their income to rent. Pakistan was faced a housing backlog of around 9 million units, with an annual increase of 270,000 units. In coming next 15 to 20 years Pakistan needs to deliver about 400,000 housing units per year. So, housing issue has to do with quantitative and qualitative in adequacies. According to studies carried out by the World Bank in 2009, housing unit was backlog 7.5 million and calculated as 0.35 million annually in Pakistan. On the supply side, different strategies have been implemented by the government to respond to this huge shortage. But all these attempts were hampered by high building costs, housing funding limitations, tight loan agreements and bank mortgages, etc. There is a disparity between the need for housing and housing demand or the right to choose preferred housing. Although there is a huge housing shortage, the fact that people can only get what they can pay for is important to recognize.

Pakistan housing condition has been remained under pressure. In both qualitative and quantitative terms because confronted housing issues. Pakistan faces a severe housing shortage, particularly in case of low- and middle-income groups. The rate of demographic changed was not the same in the second half of the last century. The rate of demographic change was not the same as second half of the last century. During the period in 1950 and 1990, Pakistan's overall population was raised at an increasing rate. Housing issues might be continuing to grow if they are not addressed on time properly. Based on rough estimates, there was a deficiency of six million housing settlements in Pakistan during the year 2004, and this figure has since grown (Azim & Ahmad , 2008). According to World Bank Data, up to 8 million housing units have become even bigger in 2009. Within the tiny 5-year period, the gap grew by adding 2 million houses to urban poor. But in large cities, the

major difference between requirement and distribution is making people migrate to shelter settlements of poor quality of cities far from urban centers.

Census data indicate a shift in Pakistan's population's age structure: the labor force's growth rate was higher than the total population growth rate. In 2005, total population growth as percentage and the working-age population (age 15–64) rose from 54 percent in 1998 to 57 percentage. Similarly, the ratio of dependency (under the age of 15 years and above the 64 years separated by the working-age population) decreased from 0.86 to 0.75. Over the next two decades, these patterns are expected to continue, besides the dependency ratio will be hit lowest level by 2030. The dropping ratio of dependency means that more workers take attention of less dependents. Therefore, when entities of working age have access to meaningful jobs, this represents a window of opportunity for increased economic development. The data suggested that Pakistan's so-called demographic dividend will last until 2050 when population growth rates and labor force will expected to merge (Azim & Ahmad , 2008).

Mahmood, (2010) examined the period 1980s, there were various number of challenges faced by population size for economic development such as education, productivity of employment which increase the labour force. Similarly, number of fertility decline, skilled labour migration and labour force absorption in markets in demographic factors. Especially labor force participation rate in female which provide strong contribution in education level, skills and also fertility rate. In Pakistan case, labour force transition has been slow which revealed from unemployment to employment level. Although, 15 percent people were unemployed as chronic term. Another side, education, work experience age and training factors exposed the large influence of retentive employment.

In case of housing affordability which explained as the" Housing units affordable by those people whose income is below the average household income". A house affordability is the most important factor to accomplish in the current situation of rapid urbanization in Pakistan. As low-income and affordable housing is the most promising way to address the housing shortage problem. The main aspect, in case of all public housing projects which more than fifty percent of the total housing units should be allocated to low-income people, and the remaining fifty percent would be consistently distributed between middle-income and high-income social groups. Nazli & Malik, (2003) investigated on housing durable asset for poor such as security base, opportunity and

empowerment. These three main dimensions which reduce the poverty in economy. It also enhances and need to be strategy for good standard and reduce the poverty. Because inadequate houses are made disempowerment and insecurity for the poor people. From the period 1998 to 1999, index of poverty was defined by Pakistan Integrated Household Survey PIHS that showed housing inadequate data. According to PIHS data identified that the frequency of poverty was higher than living standard or consumption income statistics.

Bongaarts *et al*., (2013) defined the Malthus predictions who examined the issues of standard of living by rapidly increase in population growth. Although, age structure of the population indicated the potential to increase the economic growth. Similarly, in Pakistan case, it has strong effect pattern showed which that predict the coming decades will be potential to economic macroeconomic performance by change in demographics. According to the (ILO 2010), defined the unemployment in youth population was greater than the average unemployment.(Sparreboom & Shahnaz, 2008) investigate during the period of 1999 to 2000, female youth those not get education and involved in any economic activity that was much higher at 72 percent. But in 2005 to 2006 this ratio was decrease by 63 percent. According to (Hou, 2010) argued that employment in youth population was made the striking thought which not show unemployment rate at high in educated youth. But the youth who availed high -educated their initial income was not different as compared to less- educated youth population. In globally rapid aging population increase, Pakistan scenario youth population demonstrate that dynamic part of productivity and also economic growth. During the 2005 period indicated that 60 percent (i.e., 90 million) of total population was than 25 years. Moreover, below 14 years people was accounted for at 40 percent. Although, labour force was estimated at 30 percent between the 15 to 24 age group. In 2003, labour force was increased by 3.5 percent in Pakistan. Furthermore, the unemployment was 6 percent between the 2010 and 2011 period. Pakistan demographic dividend changes with the passage of time which show the economic management improved and it has potential to raise the economic growth. Besides this, it can also help to reduce the poverty and much improve in living standard of people. Because in bulge youth which can lead in revolution and also improve the country destiny.

According to Azim & Ahmad, (2010) studied showed that 600,000 units was calculated in the annual aggregate demand. Furthermore, in terms of inadequate housing which was located near the city side to meet their need for housing facility and employment was only a way out for the

poorest. By lived in the form of slums, squatters, informal settlements and most of the people lived in inner cities, this gap is fulfilled by them. The high levels of the population increase the demand for adequate housing in urban sectors. It estimates the Pakistan's population which was over 60 percent to be below the age of 30. Another age brackets 15-49 age group such as labor force was calculated at 96 million in 2010. It is predicted to increase as 181 million by 2050, while over the same period the overall population is likely to increase from 110 million to 235 million. It means that he next four decades, 3.1 million men, 2.1 million of whom will be old, are expected to enter the labor force in every year. This demographic changed have explosive social and political consequences unless they are provided with quality of education, in health, and livelihoods. Estimates reported a shortage of nearly 7.5 million units of housing [SBP (2013)]. More than 0.35 million rises in the difference between supply and demand.

Different age groups have different economic activities in the consumption life cycle. Young population interested on spend their income on education, health, supply labor, savings but Old people after their retirement income again invest on health. Labour force is too good for better economy because it prevails the demographic dividend play a vital role in economic miracle. In 2006, working age population was almost 59 percent in country. In 2009, working age population was accounted for 121.01 million. Although, employment labour force size was 52.71 million estimated. Pakistan has bulge youth population, growth rate is the highest as compare to Bangladesh, China and India. It is also faced declining in dependency ratio. Because between the ages 0-14 would be enter in the working age phase in 2050. Through increase the working age population which effects the output per capita like producers surpasses to consumers and then second channel other sides savings increase that indicates that capital much available and cheaper relatively. In both perspectives, micro and macro level by raise savings and investments (ESP, 2010).

Kumar, (2011) investigate on rural areas poverty had been mostly shown in historically period. Recent trends, still, indicate that rural poverty had been deteriorated faster than urban poverty. According to the World Bank's records at $1.08 per day poverty line in 1993 by (purchasing power parity). In South Asia, between 1993 and 2002 the poverty headcount ratio as an entire declined by 4.28% calculated. Furthermore, the statistics for rural and urban sectors presence 3.28 and 0.87%, correspondingly. India, which presently accounts for practically three-fourths of region's

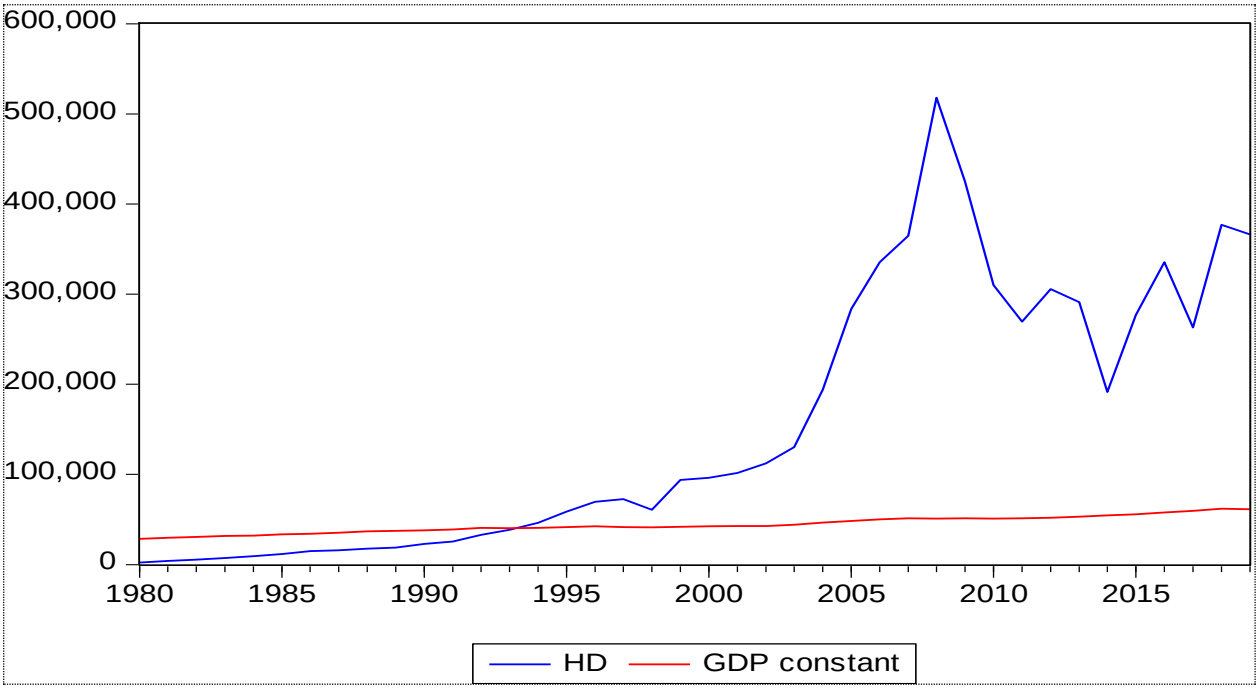
residents. Besides, this perceived a much steeper deterioration in to the urban poverty that showed at 5.0 percent as related to 1.09 percent in urban sectors. However, these proportions covered the challenge in total numbers. At the similar period in the rural poor sector was declined at 8.31 million was accompanied with an increased int the urban poor at 4.23 million. Inequality remains too much high in urban. In Pakistan was recoded as 0.43 percent I 2004.

According to Hasan & Arif, (2018) research estimation on housing demand showed different factors values such as 700,000 units total demand per year. Similarly, 350,000 units calculated in urban demand per year. Additionally, in case of Lower-income group which showed the value at 62 percent. Another side, 25 percent include in Lower middle-income group and other higher/upper middle-income group was 10 percent resulted. Moreover, in formal supply 250,000 units per year, urban supply 150,000 units per year and last rural supply 100,000 units was calculated per year.

Khalil & Nadeem, (2019) investigate on housing crises was estimated value 350,000 units per year, and in future predicts the incremental shortage as 400,000 units increase per annum. It described into three different factors of the housing crises such as social and demographic, cost of land and construction high and last week with incoherent finance and banking sectors. Pakistan estimated value of population is 207 million and 2.4 percent population growth rate per annum. Moreover, 700,000 units annual housing demand, that is only half are existence level by new production housing. The housing shortage has been felt on urban sectors because population in urban areas was actually grow faster than the total of population in country. Hence, its value 2.7 percent estimated as associated with 2.4 percent per year. During the period 1998 the average household size in urban areas was 7.0 to 6.2 to 2017 decrease respectively. According to the World Bank, urban population lived around 47 percent in informal conditions i.e., kutcha Abadi with limited facility of sanitary and public infrastructure. According 2017 mortgage housing finance to GDP ratio was accounted for 0.23 percent which too much lowest form in the South Asia. In 2018 period, housing loans value was 68,000 estimated. According to this, mortgage loans were 1,500 which prolonged in every year. Moreover, 2016 period average loan size was 6.1 million rupees, while average loan to value ratio was 48 percent recorded. Another side, imposed to borrowers had arrange their remaining 52 percent amount of house by own savings. In 2018, State bank of Pakistan introduced the policy for low-cost housing finance. It deals with both dimensions like at

mortgage subsidized financing for low-income groups and construction finance be subsidized in aspects of builders or developers to raise the supply side for low-income housing finance. Beside this SBP policy resolve the problem of housing which increased by number of borrower's mortgage since 68,000 in 2019, and it to be 200,000 by 2021 period. Moreover, balance of mortgage finance that time increased by 83 billion rupees to end of the period accounted for 250 billion in Pakistan.

According to figure 2.1 shows the line graph between housing demand and real GDP per capita. Blue line shows housing demand and red line represent real GDP per capita. Housing demand variable show increasing trend after 1994 to 2008. After this peak period the housing demand show decreasing trend gradually in the 2011. There are many factors behind the decreasing trend, like financial crisis, terrorism activities, energy short fall and economic slowdown. But after less demand for housing the graph moves gradually fluctuate ups and down manner. In following sub sections, study explains the different factors that cause the fluctuations in residential investment or housing demand in our case.



1.2.5 Role of Financial Institution in shaping the Housing Demand

There are two main finance sectors located in Pakistan i.e. (Housing Building Finance Company and commercial banks). According to record, in 2005 housing finance sector was raised from 55.29 to 70.34 billion in period of 2010. During the period 2000, the dependency ratio in Pakistan was calculated as 84.1 which represents that greater than the value of dependency ratio in developing countries. In working age population expressed the age between 15 and 64. Additionally, dependent population age considers as below 15 years old and above 65 years in Pakistan case. From 1950 to 2000 working age ratio was declined 1.31 to 1.19 percent in the fifty years.

According to Housing Finance Review , the investment portfolio for housing finance was recorder 69.26 billion rupees, which showed an increase value 5.42 percent(SBP, 2016).House Building Finance Corporation largest shareholder offered gross loan at 23 percent to housing demand consumer. Another side, HBFCL reported at 35.04 percent of new borrowers for housing finance and paid 11.09 percent to the new payments which was corresponding to 1.12 billion in rupees. Furthermore, in Islamic Bank that show a main player at 38 percent provided the gross loan outstanding for housing investment. All of these was indicated that an increase in disbursements was good effort which reflects the enabling situations for housing finance. Through 40 industries changes which associate with housing sector that represent the advantages for raise in economic growth. In Pakistan, housing finance trend was gradually raised with the passage of time.

Although, non-availability credit has another limitation for in housing finance. Borrowers take risk which are linked with lending and interested in to get information about terms and conditions for housing finance. Similarly, the lenders also showed concern about credit- worthiness. So, all knowledge is beneficial for growth in housing finance market. Additionally, in housing sector without main robust mortgage market the demand for housing is not increased. Housing finance for short term deposits and also long-term maturity generate liquidity risk to the funding organizations. In Pakistan case, 21 percent share was Islamic modes of housing finance. There were largest slum population in Pakistan. Furthermore, it is unrealistic scenario for slum residents which deliver from medium quality to high quality of house. While there are authorities who at least provide the low-cost houses in terms of healthy, secure and good environment. First State Bank of Pakistan which established the advisory group for gave suggestion to housing mortgage Refinance Company. Moreover, Pakistan offered the Mushakah Mutanaqisah to consumers

facilities for housing. In housing finance perspective Pakistan was at the top beneficiary which calculated at 71.7 percent. Furthermost housing finance modes were founded at lease and loan.

Pakistan has youthful population so in future perspective, they will provide as a potential power risk and more advantages for country. In case of demographic transition labor supply will rise smoothly. Firstly, population of working age will increase which shows overall increase in the labor supply market. Secondly, decrease in the number of fertility rate that cause increase the female labor force participation rate. Another main reason of labor market is lack of education and skills that shows the main issue for housing demand. Moreover, rural and urban areas an increase in housing rent that shows pressure for youthful population.

1.2.6Conclusion

This chapter exposed that there is a difference between demand and supply in housing sector of Pakistan. Because an increasing population growth not only matters but demographic (age brackets) also key factor to take decisions in individual economic life. Pakistan is going to the demographic transition which means new generation baby boom were entering into working age phase. Moreover, female participation rate has increased. This chapter has emphasized the important determinants of housing demand in Pakistan. Additionally, different macroeconomic variables were influenced and play a vital role in increase housing demand. There are different elements influenced which raise demand for housing in developed and developing countries such as tax laws, credit facilities, household head age, migration, tenure choice and income level etc. In housing market, the government of Pakistan unsuccessful to design and make suitable national housing policies which analyses the affordable challenges faced and also weak implementations were worsen the situations. Moreover, housing finance has remained very low because of stringent procedures and high interest rates.

1.3 Rationale of the Study

Developing economies are continuously suffering from shortage of houses that further cause overcrowding in settled areas and generate new slums areas nearby cities (Uwejeya, 2012). High and persistent population pressure is associated with high unemployment rate and also put pressure on housing demand. Fluctuations in macroeconomic indicators also play key role in housing market. Housing supply increases with the improvements in macro economy. In literature,

residential investment is considered as leading variable of economy. Moreover, the hidden momentum of population is also other potential source of housing demand. The hidden momentum of population should be empirically analyzed. Because various age groups of population determine the path of housing demand over time. If we want to observe dynamic path of housing demand, then demographic or aging groups help us to do this. So, in present study, we are going to explore this avenue of housing demand with help of different age groups population. Pakistan has the highest youth population in overall composition of population.

1.4 Significance of the Study

This study is going to empirically analyze the effect of demographic cycle and macroeconomic indicators on housing demand in Pakistan. Furthermore, this study focusses on those age brackets which help to facilitate in current housing scheme. In previous literature, macroeconomic variables are analyzed as determinants of housing demand. But in case of Pakistan, there is not a single study which empirically analyzed the effect of changing age structure on housing demand. Secondly, we estimate the model that was developed by Mankiw and Weil (1988) (see also; Azim & Ahmad, 2010).

1.5 Objectives of the Study

Following are the objectives of study.

- Analyze the effects of various age brackets of population on housing demand in Pakistan.
- Empirically analyze the effects of macroeconomic variables on housing demand in Pakistan.

1.6 Research Question of the study

- How various age brackets of population effect housing demand in Pakistan?
- How macroeconomic variables effect housing demand in Pakistan?

1.7 Limitation of the study

In this study, from Pakistani perspective no doubt remittances play a vital role in residential investment or housing demand but here we use some indigenous factors that play critical role in housing demand along with aging groups. In literature, housing sale and total facility of credit for mortgage purposes are used as proxy of housing demand. But such data is not available in

case of Pakistan. So, present study uses schedule banks advances for real estate purposes as a proxy variable for housing demand.

1.8 Organization of Study

In chapter two, we represent the previous literature and try to understand the issues about housing demand. Section 3 contains the micro foundation and macro base theoretical justification of our study and also chapter discuss the model and methodology is key part in which we try to develop an econometric model and proposed method to estimate it. Empirical findings are discussed in chapter four. The chapter 5 conclusion and policy recommendation are presented.

1.9 Statement of the problem

Fortunately, Pakistan is a youthful population in the World. Housing is a main concept in every field of life. Because people live with comfort and peace for enjoy their life. At time of leisure that makes them more potential to do work very efficiently. Pakistan facing both quantitative and qualitative issues from many past years. In the advantage of young population growth that cause more demand for housing in country. This is the main key factor (demographics) that determine the demand behavior which will be helpful for the future of economy as well as housing sector. As we discussed earlier the two problems of housing the first one is compromised quality of houses or substandard quality as compared to international standard. The second issue is quantity of houses that also very low. So, in this study, we just focus on the quantity of houses in form of residential investment.

CHAPTER 02

LITERATURE REVIEW

In this chapter, we are going to review the existing literature of house demand and its various determinants. There are many empirical and theoretical attempts which have examined the house demand across the World. We further proceed this chapter by dividing it into three separate parts. In the first part we discuss the literature of developed nations. While in the second section, literature of developing nations is going to discuss. The last segment of this chapter contains the literature of Pakistan.

2.1 Developed Countries

Urban housing demand was defined by (Kottis, 1971) during the migration in United States. In this research secondary data was used and Muth's model was adopted. There was direct positive link between demographic characteristics, income, migration in housing demand. On the other side, higher demand caused increase in rent and also house prices. The study concludes that after the changed in price elasticity of demand some individuals was less consumed, housing densities got increased and decrease expenditure terms on other goods or also decrease saving. The study comes up with result that positive relationship between rent and migration. Moreover, the increase in population by net migration increased the demand for housing.

Manchester, (1987) scrutinized on inflation and housing demand in US. In this research SMSA data pooled time series and cross section data was used. Kearl's and Poterba's model was applied. Linear OLS and 2SLS technique was used as methodology. The study focused on effect of demographic and income has primary impact on housing demand. Additionally, other effect on it such as changes in relative prices and tax laws. The study concludes that nominal mortgage rates and credit availability and public expenditures had strong significant positive effects on housing demand. Moreover, inflationary expectations showed negative response of house prices to the real user cost of housing. According to result showed that relationship between taxes and inflation and as well as cash-flow constraints had strong effects on the relative price of houses.

Harmon, (1988) investigate on the elasticity of income for single owner occupied of housing demand. In this study panel data was collected and descriptive analysis was used. The findings of the study showed children and age factors indicated that systematic effect on housing demand.

The study concludes that the tenure elasticity such as population ownership was much high on housing demand. Moreover, the elasticity of income was 0.70 estimated. While, price elasticity showed negative but statistically significant. The income elasticity was not sensitive as permanent income for housing demand.

Cheshire & Sheppard, (1998) measured the demand structure of cities in case of England. England is a developed country. In this study cross section data was used for the year of 1984. Box-Cox transformation methodology was used. Later on, OLS estimation technique was applied on above model. On the other hand, Almost Ideal Demand System (AIDS) was used for estimation of prices. Furthermore, the key objective of this study was that elasticity of price which determined the desired pattern of residential location for demand for land within an urban area. In case of Darlington income which showed lower while Darlington price elasticities was to be closer in Reading city. The findings of the study indicated that income elasticity of house demand was high in high-income groups as compare to the lower-income groups of England. According to the result showed that income elasticities slightly greater than North America cities was comparable estimated.

Mankiw & Weil, (1989) highlighted the demographic changes on housing market what impact proceed in the US. This study is basically analysis of housing market after the World War II. In this study, cross section and time series data was used from 1940 to 1970. Then intertemporal model of the housing market also discussed for micro-foundation. First, the major impact of demographic changes for housing demand observed that have significant impact on the price of housing market. According to this study, the main cause of real housing prices increased in 1970s, because one percent increased in housing demand that the influenced to five percent increase in the real price of housing. The study concludes that large part of the demand for housing was made-up of those between the ages of 20 and 30 and after age 30 it showed flat result. Moreover, disposable income also increased by 22 percent and after-tax interest rate variable was showed insignificant result. The study concludes that relationship between real price housing and housing demand showed strong highly significant.

Dipasquale & Wheaton, (1994) investigated the housing market dynamics and future housing prices in the US. The study applied two stages least square estimation. Structural model was developed. The study highlighted some key factors in demand of real state that were negated earlier

(i.e. actual per capita income, long run the negative shocks, including demographic shifts, and competition for immovable property). Moreover, income and price elasticities along with demographic factors were considered main determinants for single family houses in market. The finding of the study during the period of 1990s aging was acting as a negative shock for housing demand and also observed single household formation was slower to demand for housing. The study concludes that demand for home ownership was more flexible then housing prices. Furthermore, supply of housing in the long run was quit price elastic and it played an important role in mitigation that showed the effects of any negative shocks to the demand side.

Goodman, (1990) presented the impact of demographic on housing demand in Unites States of America (USA). In this study data took from USA housing survey .The study estimate the income and price elasticities through the Probit model. It observed that tenure choice and demand was jointly measured for the housing demand. Explanatory power was enhanced significantly in both the tenure choice and the demand regressions by use of demographic variables. Furthermore, income elasticities were not substantively changed in term of demographic factors, while elasticities away from the means was sensitive to their inclusion. Additionally, the study found a negative but resulted significant impact of age and race on rented house. On the other race side, black people have less demand for housing then whites and also number of household size might be matter, but not very much.

Ohtake & Shintani, (1996) investigate on the demographic effects on the housing market in Japan. The study took data from National Survey of Family Income and Expenditure In this study notion of co-integration and error correction model was used. In this study co-integration and error correction (ECM), Engle and Granger and vector autoregressive (VAR) technique was used. Mankiw & Weil model was applied. The finding of the study showed high price elasticity for long-term housing supplies contrary to U.S outcomes and conclude that the effect of demographics on Japan's housing prices appears through a short-term adjustment process. The study concludes that demand for housing in Japan was rapidly drop after 65 age.

Romanik (1996) measured the housing demand for middle and low-income population of Panama and David city. In this research secondary data used and hedonic regression technique was applied. Malpezzi's model was developed to define the relationship between income and housing demand. The finding of the study showed that David household size was insignificant. But in case of

Panama household size was significant the study concludes that tenure variable was statistically significant in all model except for David renter houses. Moreover, income variable showed effect was large and significant.

Green & Hendershott, (1996) aimed to analyzed on demand for housing by demographic and real house prices in the Unites States of America (USA). The study applied Rosen's (1974) well-known model which related to the housing demand characteristics to (among other things) demographic factors. In this study secondary data was used. The study linked real per capita house demand to age, other demographic features, education, and real income. The findings of the study discussed real house prices was led to willingness of household to pay in a constant-quality house. While in the changes of housing demand quantity then it causes effect on real prices which defined the housing supply has positively sloped in the long run. According to the total derivatives result, associated with Mankiw-Weil age demand results were similar but on the other partial derivatives showed that the demand for housing have a tendency to be fiat or increasing slightly with age. Moreover, due to changes on other factors indicated negatively affected to willingness to pay such as if increased real after-tax interest rates and it’s also main important factor willingness of households’ demand also depends on willingness of builders to supply house. Additionally, even if demographic changes do not reduce aggregate housing demand, these changes could significantly alter the composition of that demand. Significant changes in real prices of different types and configurations of houses in different locations could result. To infer from the cross-sectional negative' full age derivative' that housing demand of today's 50-year-olds was declined sharply as they age ignore the fact that, unlike the cross-section, the formal education of these people will not decline sharply as they age and thus the fall in their real income is also likely to be far less than that of the cross-section.

Leclerc & Fortin, (2000) presented the impact on real prices and demographic change in Canada. The study used 3SLS as methodology and time series data was estimate. Mankiw & Weil and also structural model of housing demand for examined the demographic shocks was developed. A logarithm of the housing stock has been used to estimate the demand for houses and is made up of various market factors. The finding of the study showed 25-54 age groups showed the highest impact on the demand for housing from 1958 to 1997. In 1990s the demographic was changed by 20 percent cause of price decline and economic slowdown. Hence, it was showed that demographic

was dominant factor in 1990s mainly the housing price fall. In 1981-82 years, case real income was decline cause of price fall, while increased the interest rate was played an important role.

Tiwari, (2000) aimed to analyzed the housing demand in Tokyo. The study used time series data and nested multinomial logit model was applied. The study focused on three main determinants such as dwelling size, tenure and structure type of house included. According to this study, homeownership income elasticity was showed positive while, rental income elasticity got negative indicated. Another, price elasticity of ownership was smaller magnitude measured. Furthermore, in case of rental price elasticity had larger magnitude. The study concludes that the share of age of head for single family as home ownership was high than multi-family. Hence, Household increased in the form of home ownership was raised in Japan.

Lee *et al*., (2001) highlighted the connection between Austrian demography and housing demand. In this research demographic factors and net migration was main variables which determined the housing demand. Time series data was used and Mankiw & Weil, (1989) housing demand model was applied. According to research, construction investment deflator relative to the gross national product deflator as the proxy used in the Austrian residential housing prices. The finding of the study showed that, in case of adult population, inflation and subsidy effect which showed statistically significant on housing demand. The study concludes that income showed positive relation with housing demand like one percent increased in money income resulted in one percent increased in the total quantity demand. While on the other side, interest rate showed statistically insignificant cause of insensitive housing demand for cost of housing finance. Although, unemployment rate was used as a cost shifter which showed statistically significant because during the unemployed people had more leisure time to more build houses.

Supan *et al.,* (2001) investigated on housing demand which examined the cross-sectional variation or comparison between Germany and Japan. Pooled data and hedonic price estimation and also goodness of fit technique was used. In this research mixed logit model was applied. The finding of the study showed that, in case of Japan home ownership was greater than Germany. Another consumption level was much larger in Germany than Japan. It means Japan had a greater number of household members. The study concludes that human capital had stronger effect in Germany. Although similarities were shown in both countries such as income effect reduced but showed

highly significant in long term analyzed. Furthermore, owner-occupancy increased by permanent income.

Hasan & Taghavi, (2002) scrutinize on macroeconomic activity, residential investment, and also financial deregulation in the United Kingdom (UK). The study used cointegration hybrid and vector autoregressive model (VAR) adopted. The finding of the study to explore the empirically relationship between UK macroeconomic variables and residential investment during the period 1968–1999. In short, result conducted the strongly confirm that the deregulatory and innovative measures of the 1980s changed the nature and strength of causal connections between macroeconomic variables and residential factor.

Davis, (2003)(Davis, 2003) presented the study on housing and the business cycle in the US. The study took secondary data. Study applied vector autoregressive (VAR) model and multi-sector growth model. Through industry level data was reported that residential investment as more than twice unpredictable in business investment. The findings of the study showed that in consumption, residential and non-residential investment were showed positive result. Furthermore, residential investment led to the business cycle, while non-residential investment is lagging behind. The study concludes that high volatility of residential investment can be due to the intensive development of residential property, and the very gradual depreciation of residential structures. Moreover, the main effects of increased in the volatility of labor supply, to increase the output and also increased in the housing price correlation with residential investment. Because after the tax shocks showed the demand for housing was shifted.

Lindh & Malmberg, (2008) presented the demographic and housing demand in Sweden. Time series data was used. In this study main determinants were residential construction, age structure and house demand. The study examined the share of gross domestic product as taken for residential investment from 1950 to 1996. Age structure was divided into six groups. The findings of the study showed that young adult groups got positive and large demand for housing. On the other side, middle age group 50 to 64 years age groups were observed peak income and net saver in society. The study concludes that these age group showed negative effect because their investment portfolio was shift from real to financial asset. But in case of 70 above age group there was statistically insignificant because of ill health.

Fontenla & Gonzalez, (2009) aimed to analyze on housing demand in 21 metropolitans of Mexico. Box-Cox transformation and time series data was applied. In this research micro-level data was used. The main determinants of this study were income, population, housing shortages, mortgage. The findings of the study showed that permanent income got significant result while, temporary income indicates low elasticity of housing demand. Moreover, in case of male demand for housing was low as compared to female demand. Although, married couples got more demand for housing then unmarried. Furthermore, number of dependents and household age showed less amount of housing demand. Additionally, male and married couple's income level was much higher than female and unmarried people income. The study concludes that in developed countries the price elasticity of housing demand was lower as compared to developing countries.

Lichfield, (2010) scrutinized on household size and dwelling size in future perspective of housing provision in Nottingham. In this research defined household size raised or reduced in different manner, when family structures matured or older and children start their jobs so housing consumption was not decrease at the same rate. Moreover, financial capacity, tenure and migration also main factor which determined household size. On the other hand, married couples increased housing demand than other types of household. This result showed that there was no direct relationship between household size and dwelling size.

Adams & Füss, (2010) highlighted the macroeconomic determinants of international housing markets for 15 developed countries. In this research time series data was used. Panel cointegration dynamic OLS technique was applied. The findings of the study showed that interest rate in the long term was made an attractive for residential investment in country. But long-term interest rate increased then it reduced the residential investment which turns lower the housing price. Besides, increase in construction cost which cause increase the prices of housing and also rent. The study concludes that there was 1 percent increased in economic activity then the housing demand was raised.

Bujang *et al.,* (2010) summarized the impact of demographic factors and housing affordability in Malaysia district Johor Bahru. Data collected through secondary data and questionnaires. Yamane Formula (1973) was applied. In this research Likert scaling, cross tabulation, Pearson Chi square test and bivariate correlation was applied as methodology. The main focused of this study determinant of demographic such as household size, marital status, income and education level

which had strong influenced on housing demand. The study concludes that due to increase in population size that cause to migration and got increase in housing demand. Income level had significantly increased housing demand. In the case of education level, higher the education level had direct relationship with increase of housing affordability. Moreover, high income earned had strong influenced on affordability. On the other factor of marital status had statistically negative relationship with housing affordability.

Chandler & Disney, (2014) highlighted the effect of house price volatility on households in UK. Time series data and ANOVA technique was used. The findings of the study showed demographic, household size, net migration and population size main determined for housing demand. The study concludes that in the long run real income raised then the households invest on housing demand. Moreover, in case of short run, credit availability which is determined by the interest rate that resulted showed statistically significant impact on housing demand.

Karantonis, (2014) summarized the case study in the city of Sydney for examined the relationship between housing affordability and population growth. The finding of the study showed that population growth was a major dominant factor in housing demand. The study also discussed the expected population growth of Sydney, which will lead to further growth in housing demand. An another without a new housing supply, it pushes up the lease and purchase rates for housing. Nonetheless, as shown, the solution was not to supported those in affordability pressure by implementing measures that will mitigate the current problem. The study concludes that demand and higher prices were included in the long run because households were spending much more on housing as a ratio of their income.

Holmans,(2014) highlighted the housing need and effective demand in England. Data was collected by department for communities and local government (DCLG). The study was examined the existing theories and indicators of housing needs and how they contribute to successful demand. The findings of the study showed that efficient demand generated by household increased in the private sector. In this study showed unlikely to be sufficient to provide enough housing to sustain the expected share of household growth in the private sector. The study concludes that high proportion of the increase comes from household growth.

Huang, (2015) highlighted the impact of residential investment and economic growth in Canada. In this study time series data was used. The study applied vector autoregressive (VAR) model and Granger Causality test and a cyclic sequence technique. It identified the connection between residential investment, non-residential investment, and Canada's economic growth using two approaches. Residential investment played a vital role in economic growth. The findings of the study showed that in the short run relationship among gross domestic product, housing investment (with or without consumer credit), firm investment, and consumption (non-durable goods and services) has strong influenced on housing demand. The result concluded that in the short run growth of unadjusted housing investment (with or without consumer credit) in Canada has not predict the growth in GDP. Besides this effect was more evident for firm investment.

Li, (2015) investigated on homeownership in generation for X and Y demand in Hong Kong. Time series data and descriptive statistics was analyzed. The study discussed the generation gap discussed X during the 1961 to 1980 generation born and Y showed between 1981 and 1995.Data was collected through interviews. In this study focus on main variables such as housing price, income accessibility and affordability of house. The finding of the study showed that Y group most important factor was affordability and X group indicated the price of house. On the other case of Y group showed interested in married factor and X showed on location of the city. The study concludes that generation X showed most significant result on quality of life and Y considered on homeownership.

Choi & Painter, (2015) scrutinized on housing formation and unemployment rates in US. In this research time series data and vector autoregressive model used as methodology. The study applied Augmented Dickey Fuller (ADF) as technique. The findings of the study showed that in the long run permanent increase in the unemployment rate was not affected on housing formation. The study concludes that number of households statistically significant relationship with the Housing price index (HPI). After this housing demand increased with the rise in household size and also with the permanent increase in the unemployment rate.

Shuyi *et al*., (2017) highlighted the factors of macroeconomic variables was affect the housing price in Japan. In this research time series data and autoregressive distributed lag (ARDL) model was applied. In the short run, there were three macroeconomic determinant such as population, GDP and inflation were examined. The findings of the result showed that GDP and population was

significantly result influenced on price of Japan. Besides inflation had negative impact on housing price of country. The study concludes that in long run case, GDP had strong impact on housing price which showed positive result. Moreover, inflation was negative impact on housing price. Additionally, population had no relationship towards housing price.

Keil, (2017) aimed to analyze the Real Estate fundamental determinants in regions of Germany. In this study panel data was collected and Pooled OLS and fixed effect technique was applied. The main focus of this study was market size, apartments rents, age structure, rent prices and local infrastructure. The finding of the study showed that demographic factor, there was negative result indicated on high share of population outside of working age which decreased the housing demand. But increased in household size and income showed positive effect on housing demand. The result concludes that increased in unemployment rates cause of housing prices. Another panel regression test result concluded that households, demographics, interest rates, local infrastructure such as hospitals and income had positive corelated with demands. Moreover, in case of unemployment that showed insignificant result.

Monnet & Wolf, (2017) scrutinize on demographic cycles, migration and housing investment. Housing investment is high volatile component of GDP or business cycle in macroeconomics literature. In this research discussed the residential investment as housing demand. In this study panel data was used for OECD nations. According to this study, the main determinates of housing investment are demographic cycles and migration to OECD nations from other countries. While rate of housing migration is directly linked with business cycle fluctuations. In boom periods, it is observed that high migration that cause more residential investment in OECD. According to results, the sparking age group is 20-49 years that is sole factor to determine the housing investment. on other hand, if migration starts from a country, then it causes lower residential investment Study used data from 1980 to 2014 for all countries. Six different econometric models are estimated. Age group in each model is statistically significant. It is also interesting as well astonished findings in case of developed countries. There was inverse relation between age group of 50 plus in residential investment. Study concluded that population growth is equally important as macroeconomic indicators. So, in the long run various ageing group and economic conditions matter for residential investments.

Liebersohn, (2017) investigated on housing demand in regional house price and consumption level of US. In this study panel data was used. Augmented Dickey Fuller, goodness of fit and ANOVA technique was estimated. The study applied benchmark models differentiate the demand shocks and supply elasticities in housing price. During the period of 2000-2012 industry exposure result concluded that demand shock was much correlated with housing price. The findings of the study showed that these regions showed high housing demand by employment rate. The elasticity of consumption as compare to housing price there was no control for housing demand. In exposure period raised the payrolls and rents but housing price was fall. The study concludes that through micro-level data result indicated that elasticity of consumption housing price was smaller than consumption of renters to owner household.

Leszczyński & Olszewski, (2017) highlighted the housing market in primary and secondary sectors which examined in 17 largest cities Poland. In this research secondary data and Unit root test and VAR technique was applied. In primary markets (new construction of houses) and secondary market showed existing stock were including. In this study the main determinants were wages, interest rate, unemployment rate and mortgage availability. The result concluded that prices was more strongly react then primary markets. Another the real interest rate was more twice high.in secondary market income changes, mortgage availability and interest rate showed more significant stronger effect on price than primary market.

Zainon *et al*., (2017) scrutinize on the demand for affordable housing which factors affecting among the middle-income groups in klang valley Malaysia. Data was collected by questionnaire survey. In this study descriptive, inferential statistical test and other Pearson correlation coefficient is a statistical technique was applied. The research was conducted to identify the significant variables that influence the house buyers demand for affordable housing. In rural areas housing demand, more than urban areas. Between housing developers and quality of house has positive and other design of the house and house location has significant relationship between them. It showed that direct link with increase housing demand. According to the result concluded that house prices were the main determinant for homeownership preferences, in terms of safety and public facility. Since, living cost influenced on home buyers to face a huge challenged in housing market, mostly due to urgency of supply-oriented plan in short and medium run in Malaysia.

GU, (2018) scrutinized real estate prices that showed which factors most important to influence the changes in London. Time series data and linear regression model was adopted. In this research Gross value added, population density, and average disposable income variables were taken to define housing demand. the findings of the study showed that these three variables were strong impact on housing demand. The study concludes that income level and population size positively effect on housing demand. According to result Gross value added (GVD) statistically significant on housing demand.

Aris *et al*., (2018) highlighted those factors which influenced the residential property prices in Malaysia. Time series data and vector error correction technique was used. The findings of the study showed that population growth, inflation had positively impact indicates on housing price. Housing demand for ownership was increased on the basis of high housing price. The study concludes that lending rate showed negative effect because high value of loan means housing price much high. The increase in demand of home ownership by the citizen, thus cause the housing price higher.

Tripathi, (2019) highlighted the macroeconomic determinants of housing prices in 43 countries of the World. In this research panel data was used. Random effect model and Hausman test used for sound panel analysis. The findings of the study showed that per-capita GDP, urbanization, inflation, population aged are statistically significant effect on real housing price. On the other hand, the percentage share of employment in services sector had a negative effect on the house prices. Price-to-income ratio had direct link with housing demand. The study concludes that higher economic growth increased the income of the residents that direct and positive link with housing demand. The other variable broad money supply increased which positive effect on housing demand. According to same study, higher rate of inflation indicated that increased housing demand. While, the real interest rate was statistically insignificant effect on the real house prices.

Irandoust, (2019) scrutinized on relationship between housing prices and unemployment in the long run. This study was empirically analyzed on eight European countries such as France, Germany, UK, Italy, Switzerland, Spain, Sweden and the Netherlands included. Data was collected from OECD and world bank. Time series data and Panel Granger causality technique was developed. According to this this study the main factors was interest rates, demographic and household income examined for long run causality between them. In case of Italy, Sweden,

Netherlands and Spain found that unidirectional causality observed from housing price to unemployment. Another bidirectional causality observed from housing prices to unemployment in Germany and Switzerland. Because low labor mobility and lack of geographical which cause the effect of unemployment and housing price was statistically insignificant. Besides, there was no empirically result showed in UK and France case.

2.2 Developing countries

Ingram, (1984) investigate on housing demand in the developing country Colombia metropolis. The study used hedonic price equation and household data was collected through interviews from Bogota and Cali, (Colombia). The study found that household attributes involved in demand models and have low elasticity of demand. Moreover, the demand showed significant result of income elasticity of housing demand. On other hand, in most cases price elasticity of housing demand showed biasedness. The other empirical findings of study like the house demand were positively linked with the age of the head of household, while family size elasticities showed positive for renters and negative for owner. The findings of the study showed that family size, age of head of household, other housing price index and distance from home to work place has significant result. While gender of the head has insignificant showed impact on housing demand. On the other side, elasticities of demand in Cali and Bogota and it was compared them with Korea and US through household surveys. Moreover, income elasticities in Colombian were higher than US while price elasticities of Colombian showed lower. In other variable family size and age of head in Colombia was slightly similar to Korean estimated value and gender of head was not significant. In this research the demand equations suggested that households headed by women consume more housing than households headed by men, but research found that is rarely statistically significant.

Malpezzi & Mayo, (1987) highlighted the similarities and differences of housing demand in Colombia, El Salvador, Korea, Egypt, Ghana, Philippines, Jamaica and India. Data for this analysis was collected through the household surveys from 16 cities of these 8 countries. In this study hedonic price regression was estimated through standardized and simple cross-country modeling approach. In this research the main focused variables were income and prices of housing. In case of renters and owners the consumption level different in terms of taste and possession in nature. The findings of the study showed that permanent income elasticities were the only variable that

reasonably greater than current income elasticities. The study concluded that income elasticity of a rented house was lower than the homeownership in case of developing countries. On the other hand, price elasticities of demand in cities significantly higher than estimated of produced to another place.

Tiwari & Parikh, (1998) investigated on housing demand in 18 states of India. Study discussed in detail the economic and demographic factors that effects the housing demand. In this study urban household survey data was used. Rosen (1974) methodology was adopted for demand, supply and competitive market equilibrium. Hedonic regression technique applied for owned and tenanted houses in terms of current and future family income. Study analyzed the income elasticities of each state-and found greater than unity and significant. On the other side, the main factor which was discussed that housing cost. According to results of this study, housing demand was more sensitive to income than price. The further analyzed on demographic factor observed that in household expenditures depend on age of the household head resulted positive effect. Because old people have stable income. Other side family size showed negative impact on it. As in both cases family size increased by one member than household expenditure decreased approximately 10 percent.

Choy *et al*., (2011) presented the region-specific determinants of residential investment in case study of China. This empirical attempt identified the source of different residential investment among provinces of China. The study used panel-data. In this panel thirty-one provinces of China were cross sectional units, and the time period was 2001 to2006. The reduced-form equilibrium model and Hausman test was estimated. The main focus of this study were income, population growth, and business behavior for residential investment that mostly differ with provinces. Empirical results also maintained the behavior of residential investment. By this study as a feature of real interest rates, such that increasing production costs reduce the profit margins of developers investing in residential construction, thereby restricting residential investment. Specifically, legal land-use constraints on developments used as proxy for gross floor area of residential. According to astonished result for construction costs, which was positive but statistically insignificant. It was not consistent with the notion that a higher cost of constructing residential properties. Moreover, it made residential investment less profitable, thus restricting residential investment by developers. The study concludes that per capita gross domestic product (GDP) showed positive and statistically

significant impact on housing demand. While rapidly increased in population and high income were push factors for housing prices.

Hongyu, (2002) measured the housing investment impact on economic growth of China. In this research time series data from 1981 to 2000 was used. Granger causality test, co-integration, error correction model and vector auto regression (VAR) techniques were used to estimate the model. The findings of the study showed that economic growth which heavily dependent on investment in housing. Any shock in housing demand might be affect the economy's stability and health. An analytical concept that investment in housing has a long-term which impact on economic growth. While economic growth had long-run effects on investment in both housing and non-housing sectors. The empirical results concluded that housing construction was an important driving force than non-housing investment in country. Additionally, study also did comparison between the United States and China in terms of housing investment to GDP ratio. In the case of China, housing investment in GDP was much higher than the USA. It reflected the fact that the housing sector of China performed well. It showed that housing investment was an important indicator for short run economic growth.

Vajiranivesa, (2008) studied on Bangkok Metropolitan Region (Thailand) which presented the house demand model. Simulating housing demand model and also system dynamic approach was developed. Secondary data from 1977 to 2006 was used. In this study, demographic, social and economic key factors was estimated. Although number of housing sold used as a proxy for housing demand. In this research discussed that the total population is not a good proxy for modelling housing demand. Same study suggests the young adult group has the most significant effect on creating housing demand. The groups which do not create housing demand are children. The findings of the study showed that age bracket of 55-59 and above has negative effect on housing demand. Demographic factor such as birth rate, death rate and migration showed positive and significant effected on housing demand. The formation of new households, marriage and divorce was taken in social factors. According to estimated result showed that the number of marriages decreased, rate (percentage of divorce) increased from 1993 to 1995. Moreover, in case of economic sector such as GDP growth index, housing loans both was directly linked with housing demand. While housing price index has indirect linked with housing demand.

Oktay *et al*., (2014) highlighted the factors affecting which motivate the housing demand in Province of Turkey. Data was collected from questionnaire and cross-sectional data from Erzurum city. Multicollinearity and goodness of fit test was used. Multinominal logit model was applied to estimate the motives for housing demand. The study used housing demand as dependent variable. In this research eight factors were taken for determined the housing demand. The findings of the study showed that during the age of 31 to 49 they had more motives for children occupancy than owner occupancy. But age of 51 and above showed more motives children's occupancy. Because in this stage they had more tendency for children future demand for housing. The most significant variable discussed in study was occupancy which affected to the rental income. On the other hand, middle age and 51 above people had rental income motives rather than occupancy. According to this result concluded that retired people, self-employed had more investment motives.

Li, (2014) measured the demographics factors which effects on the real estate market in the United States and China. In this study, quantitative base data analyzed for Chinese housing market and for US housing market. T-test Parsimonious model and Analysis of Variance (ANOVA) technique was applied. This research focused on the demographic and economic factors effects changed in housing market prices. Furthermore, this study investigated on the situation of the Chinese housing market before the US financial crisis (2008) and its comparisons to the US housing market. It collected data from the United States of Federal Reserve Economic Database (FRED) and found the determinant of the National Composite Home Price Index for US, for housing price fluctuation. The GDP had a slight impact on the prices of homes which calculated as 1% change in GDP and 0.93% increase in the housing prices. Real estate prices had an enormous change depend on economic and demographic factors. In case of other variable unemployment increased by 1% that effect on housing price decrease by 0.684%. The mortgage debt outstanding increased by 1% and house prices was raised by 1.30% this would signify a higher demand for housing. Hence, the working age population in economic factor was major factor to demand for housing and it has effect on housing prices. According to results showed that the "15-64" working-age demographic was statistically significant in rising housing prices. An increase of 1 percent of people between the ages of "15-64" triggers a spike in housing prices of 2.707 percent. While demographics slightly effect on housing prices and other economic factors was much easier to regulate in country.

Guo *et al*., (2015) presented the housing prices and inflation in bank credit perspective in China. In this research time series data was collected. The study used ADF test and VAR model as methodology. In this study CPI indicator was used as inflation variable. The findings of the study showed that both inflation and bank credit had a successive positive and negative impact on housing prices. Moreover, in short run inflation had positively influenced on bank credit. According to result showed that there was negative link between higher loans and real estate values. Additionally, declining in economic growth had also impact on decrease the real estate transactions. On the other side, interest rate key factor such as lower the interest rate resulted in higher the real estate transactions and vise-versa. Furthermore, type of location was another important factor to defined housing demand. While real estate prices were not influenced on good locations. The study showed income effect was positive.

Solak & Kabadayi, (2016) examined the housing demand in Turkey. The study took Panel data and auto regressive distributed lag model (ARDL) was used. Unit root, cointegration, and bound test was applied. In this research total square meters of houses were sold taken as a proxy for housing demand. Furthermore, the main focus of this study on real income, real price and urbanization. The findings of the study showed that income level has positive relationship between housing demand and housing price. The result concluded that income was most sensitive variable in Turkey. Because during the recovery period of country housing demand was increased more than income level.

Chen *et al.*, (2016) highlighted the Real Estate prices which influence factors based on econometric model. In this research error correction model was applied for Wuhan city of China. The main determinants of this study were population, GDP and disposable income. In microeconomic perspective the population increased then the greater the housing demand. According to the findings of the study the population growth has positive correlated with an average price of commercial housing. GDP was stronger variable for purchasing the residents ability. The result concludes that GDP has positive relationship with housing demand which showed the main reason was that increased the housing consumption rapidly. Moreover, in other case of disposable income variable higher the average income then it was led to stronger ability to purchase the house.

Jin, (2018) summarized the demographic structure on housing demand in 38 regions of Chongqing. In this study panel data was used. Dynamic panel model and GMM was applied. The main focus of this study was demographic structure which determined the housing demand. The findings of the study showed that in case of children and elderly age had negative effect on housing demand. during the migration and increased population size had statistically significant on housing demand. The result concluded that through income factor child dependency rate was negative effect on housing demand. On the other hand, through savings in old age dependency rate showed positive effect on housing demand.

Wei, (2018) highlighted the urban population migration housing prices in 32 major cities of China. In this study time series and Panel analysis done separately. Cointegration test, endogeneity test, and Hausman test were applied for efficient results. According to study migration was key factor in housing demand in selected cities of China. The findings of the study showed that housing demand had direct link with increase or decrease in urban migration. The demographic scale increased in resulting the housing demand raised in urban areas. The study concludes that population aging from 25 to 34 in urban areas had significant effect such as working age population on housing demand. Moreover, due to large migrant population which effect in the short run population moved by increased housing demand. Additionally, real-estate investment and income level were significant showed in urban housing prices.

Korkmaz, (2019) studied on the inflation rate and housing price in 26 regions of Turkey. Data was taken from Central Bank Republic of Turkey (CBRT). In this study log linear and hedonic regression model was applied and Konya Causality (2006) technique was developed. In eight regions of Turkey the causality relationship was examined because this dynamic of housing price was measured by internal and external migration. Another reasons, these regions were too close in the agriculture and industrial areas that showed advantage for social and economic activity.

Obaid, (2020) scrutinized on housing demand case of Saudi Arabia. In this research time series data was used. In study unit root, OLS and Granger causality techniques were applied. The explanatory variables used were Real Income Level Per Capita (I), Housing Prices (HP), Consumer Price Index (CPI), Loans Demand (free interest rate loans) Paid for Financing Houses (LD) and Population Growth Rates (PopG) in logarithms of the variables were taken. According to result concluded that income, price, population growth rate showed inelastic with respect to housing

demand. Moreover, in other case of loans demand, consumer price index and population growth rate were most statistically significant variables on housing demand

2.3 Pakistan

Zaki, (1981) aimed to analyze the housing condition of Pakistan. In this research data for analysis was taken from housing economic and demographic (HED) along with the micro-nutrient surveys from 1960-1980. Study examined the housing conditions in quantitative and qualitative perspectives and found both conditions poor in case of Pakistan. Study found different factors of housing such as migration, increase rapidly in price of construction material. The most important feature shortage of housing was over-crowding and lack of housing facility in various conditions. Thus, over-crowding was statistically significant higher in rural areas of country. The residence intimacy level was calculated which more than three persons per room. It showed that statistically significantly higher than the adequately over-crowding level. The study concludes that migration factor causes due to increase in residence intimacy level, income inequalities and shortage of government financing in the housing industry. While rate of housing construction exceeded over the time that basically affected the lower-income groups. Because a large number of housing shortages in country. It concluded that low housing growth rate coupled with high population growth rate that produced residence intimacy level which falls over the time.

Ghaus & Pasha, (1988) analyzed the housing demand case in Pakistan. In this study, time series data analyzed to find the gap between desired demand and actual accessibility of housing. The findings of this study indicated that the rate of adjustment of the housing stock to change in level of desired demand is relatively low in country. It verified be a sign of the lack of credit availability, land and infrastructure to build a new construction of houses. They estimated the value of housing stocks, long-term income and price elasticity. The result concludes that housing shortage has declined by more than 24 percent between 1960 and 1980. Moreover, in this study permanent income was measured by real private consumption expenditure per capita.

Ghaus & Pasha, (1990) repeated the study on magnitude of housing shortage in Pakistan. The study used descriptive analysis for quantifying housing shortages. This research incorporated the fact that not only the number of housing units but also their size could change in response to population and income growth. While in urban areas, the over-crowding intensity has been declined. The number of housing shortage was measured as room has been increased and other

factor magnitude of shortage which calculated as standard additional rooms has significantly declined over the time. It claimed on Zaki's studied that in 1960 there was no shortage of housing, but other study revealed that housing stock has been tended to decline over time. According to his assumption the housing shortage has been rapidly grown. In same study result concluded that there has been a relatively slow growth in the absolute size of shortage of housing in country. Furthermore, during the period between 1960 to 1980 per capita housing shortage was declined by 24% in country.

Lodhi & Pasha, (1991) scrutinize on housing demand in developing countries in the case of Karachi. A Socio-economic and Demographic Survey sample household data was used. Box-Cox technique was adopted for hedonic rent equation. In this study main focused on attribute of formal and informal housing demand markets of city. In the case of formal housing division an analytical potential of traditional housing demand measurement was very limited in the informal division. It causes of effect by outward remittances, flaw in housing credit market, the provision of public goods at low level and difference opinion on housing. The result concludes that current income elasticity was less than the permanent income elasticity. So, income elasticity measured for those families which were living in rented house is lesser for owners.

Pasha & Butt, (1996) scrutinized on housing demand in Pakistan by using survey data. OLS technique was used to estimate the demand equations. In this study Rosen (1974) model was applied to determine the housing attributed analyzed, on plot size, living space, number of rooms and bathrooms. In this study weighted factor score for the measured of housing quality and defined incorporation of the effect of changes in non-housing prices on demand for housing attributes. According to this attribute demand showed negative signs for its own price relative to all significant at the 1 percent level. It found that price and income have strong effect on housing price and also show income elasticities of demand for housing attributes are relatively low in Pakistan. Furthermore, there have been large own-price effected and negative impact of non-housing prices were increased which faced a slow growth in real incomes and double-digit inflation in country.

Ahmad *et al*., (2002) examined on housing demand in province in Sindh (Pakistan). In this study, data was collected by survey of Sindh household and linear demand equation was applied. The study analyzed housing spending patterns and projected housing demand elasticity across various urban sizes in Sindh province. This study focused on patterns of expenditure in housing and

elasticities of demand for housing across in different urban sizes was estimated. Moreover, total household expenditure was used as a proxy for permanent income. According to the study concluded that permanent income elasticity was lowest form in the largest urban. While household size variable showed insignificant which used for large cities. On the other hand, in case of owners of house in terms of percentage of income which spent on housing has statistically significantly greater than renters. In the same study, most households (60-70%) are spending about 10-20% of their income on housing. Very few households spend more than 40 percent of their income on housing across all urban sizes (less than 10 percent). Renter households spend comparatively less on housing than owners of their property. The main determination of investment was renters and owner's relationship which showed owners were not financially strong and the economic constraints in city. Sindh was more effective than in other developing countries.

Ahmad & Azim, (2008) studied on implications of changing demographic trend for socio-economic in Pakistan. The study used qualitative data with phase diagram. In this research examined on rapid change in age structure and its influence on different ratio of demographic in the period of 1950 to 2050. The findings of the study showed that total population increased at an increasing rate, the share of children increased in the total population. Although, the total population increased at a decreasing rate, the share of children in total population was declined. In other case working age and aged population was increased from 1950 to 1990. On the other hand, from 1950 to 2000 period percentage of young dependents has been raised and that of old dependents has been falling. According to this study also found age structure in the next half century such that a majority of the population will be of primary working age, Furthermore, level of dependency will decrease leading to an increase in the ratio of working age to population dependent. It improves the total saving and expenditure efficiency of the country as the dependent population saved less than the working-age population.

Azim & Ahmad, (2010) measured the relationship between changing demographic trends and housing market in country. In this research showed relationship between change in demographic and housing demand through phase diagram. Mankiw and Weil (1998) model were applied. Pakistan has going through the demographic transition phase as baby boom generations reached the period of their working lives. According to result concluded that prices of house was directly linked with population growth rate and indirectly linked with number of houses per adult. They

found that youthful demographic pattern raised demand for housing in the country as young. While married people were usually more likely to live separately and independently. Additionally, increase in household size showed positive effect on housing demand.

Ahmed, (2015) empirically analyzed the housing demand in urban areas of Pakistan. In this research 14 large urban areas were selected by using the data from Pakistan Social and Living Standard Measurement (PSLM). Probit and hedonic rent model were estimated. Findings revealed that rent of housing was greater than of the middle-income household group. According to this study, the main determinates of housing demand are macroeconomic and demographic factors. They found that price of housing increased, then it effected on housing demand which decrease over the time. While permanent income increased then housing demand grown in urban areas. Moreover, research concluded that number of rooms showed positively and significantly effects on house price. In case of middle-income group as an individual household head, which was positively and statistically significant. On the other hand, tenure choice, all the attributes that was affected the ownership decision was showed highly significant.

Fariha *et al*., (2018) scrutinized the housing affordability in developing countries perspective and recommendation for Pakistan. In this research qualitative data was applied. Most people suffered from housing inadequacy even after allocating a large portion of their income to housing. This study defined the main cause of housing shortage are housing price and low income that creates unaffordability of housing. The study focused to identify the factors in different developing countries that cause low affordability of housing. Various factors have been identified, including location, design capacity, building materials, utilities, facilities, community layout and financial support. This research illustrated how to make all these criteria successful to achieve the goal of making housing affordable and the result increase housing demand. In case of distance between house and workplace location, there was many people who paid large part of their income to meet their housing cost. Infrastructure cost also effected to housing demand. Financial assistance in the Pakistan has a great impact on housing demand because it's provided subsidized rental housing facility, for home ownership and public house opportunities for low-income group was established by different organizations.

Siddique *et al.,* (2018) summarized the housing demand in urban areas of Pakistan. Survey data was collected from Pakistan Social and Living Standard measurement (PSLM). In this research

2-step Heckman was used. For control the selectivity bias between the tenure choice and the quantity of housing services demanded. Furthermore, rent to income ratio used as proxy for affordability which showed statistically positive relation with housing demand. The findings of the study showed that permanent income elasticity showed negative impact on housing demand. The study concludes that elasticity of transitory income was showed positive result with housing demand. Moreover, household head age as increased also showed positive effect on demand for housing.

2.4 Research Gap

In literature, various attempts are made to estimate housing demand by incorporating different aspects of durable demand. Demographic factors have positive as well as negative impacts on demand. On the same token, demographic factors have serious considerations for the housing demand in Pakistan. In case of Pakistan limited studies are found related to housing demand but we do not find a single study in which demographic (age brackets) factors are discussed.

Table 2.1 Summary of literature review (Developed countries)

Author	Topic	Year	Data, Methodology &Technique	Conclusion
Kottis	Impact of migration on housing in urban areas in (US)	1971	Secondary data and Muth's model were developed.	The increase in population by net migration increased the demand for housing.
Manchester	Inflation and housing demand in (US)	1987	pooled time series, Kearl's and Poterba's model, OLS and 2SLS.	The nominal mortgage rates and credit availability and public expenditures had a strong significant positive effect on housing demand.
Mankiw & Weil	impact of demographic changes on housing market in the (US)	1989	intertemporal model	large part of the demand for housing was made-up of those between the ages of 20 and 30 and after age 30 it showed flat result
Dipasquale & Wheaton	housing market dynamics and future housing prices in the (US)	1994	Structural model, 2SLS	There was negative age shock for housing demand. In single household formation was slower to demand for housing.
Goodman,	impact of demographic on housing demand	1990	House survey data, Probit model	It found a negative and significant impact of age and race on rented house.
Fortin & Leclerc	demographic changes and its impact on real estate prices of Canada	2000	Structural model	in real income of age group of 25-54 plays a leading role in the demand for housing
Helmenstein et al	connection between (Austrian) demography and housing demand.	2001	Time series data, Mankiw & Weil model.	In case of adult population, inflation and subsidy effect which showed statistically significant on housing demand
Jumadi et al.,	Relationship between demographic factors and housing affordability (Malaysia)	2010	secondary data and questionnaires, Yamane Formula (1973), Pearson Chi square test and bivariate correlation	marital status had statistically negative relationship with housing affordability

Choi & Painter	housing formation and unemployment rates in (US).	2015	time series data and vector autoregressive model	housing demand increased with the rise in household size and also with the permanent increase in the unemployment rate.
Mei et al.,	macroeconomic effect of housing price in Japan.	2017	time series data and autoregressive distributed lag (ARDL) model	GDP and population were significantly result showed on price of Japan. Besides inflation showed had negative impact
Monnet & Wolf,	demographic cycles, migration and housing investment (OECD)	2017	Panel data	There was inverse relation between age group of 50 plus in residential investment.
Zainon et al.,	factors affecting the demand of affordable housing among the middle-income groups in klang valley (Malaysia)	2017	Through questionnaire, descriptive, inferential statistical test and other Pearson correlation coefficient is a statistical technique	Between housing developers and quality of house has positive relationship.
Yiyang GU	most important factor that influence the changes real estate prices in (London)	2018	Time series data and linear regression model	income level and population size positively effect on housing demand.
Yusof et al.,	empirical analysis of factors influencing residential property prices in Malaysia.	2018	Time series data and vector error correction technique	Housing demand for ownership was increased on the basis of high housing price
Irandoust	Unemployment and housing prices in the long run	2019	Time series data and Panel Granger causality technique was developed.	low labor mobility and lack of geographical which cause the effect of unemployment and housing price was statistically insignificant

Tripathi,	macroeconomic determinants of housing prices in 43 countries of the World.	2019	panel data, Random effect model and Hausman test	Price-to-income ratio had direct link with housing demand.

Table 2.2 Summary of literature review (Developing countries)

Author	Topic	Year	Data, Methodology &Technique	Conclusion
Ingram	housing demand in the developing country	1984	Interviews, Hedonic price.	households headed by women consume more housing than households headed by men
Malpezzi & Mayo	analyzed the similarities and differences of housing demand in Colombia, El Salvador, Korea, Egypt, Ghana, Philippines, Jamaica and India	1987	Household surveys data,	income elasticity of a rented house was lower than the own house in case of developing countries
Tiwari & Parikh	housing demand in 18 states of India	1998	Urban household survey, Rosen (1974) and hedonic regression.	housing demand was more sensitive to income than price.
Choy et al.	region specific determinants of residential investment in case study of China.	2011	Panel data, the reduced-form equilibrium model and Hausman test was estimated	GDP per capita showed statistically positive effect in housing demand.
Hongyu,	impact of housing investment on economic growth of China	2002	Time series data, Granger causality test, co-integration, error correction model and vector auto regression (VAR) techniques	In the case of China, housing investment in GDP was much higher than the USA.

Vajiranivesa	housing demand model in case study of the Bangkok Metropolitan Region (Thailand)	2008	Secondary data, simulating housing demand model and also system dynamic approach was developed	It concluded that age bracket of 55-59 and above has negative effect on housing demand.
Li,	effects of demographics on the real estate market in the United States and China	2014	Quantitative data, T-test Parsimonious model and Analysis of Variance (ANOVA)	unemployment increased by 1% that effect on housing price decrease by 0.684%.
Ma et al.,	relationship between housing prices and inflation in perspective of bank credit in China	2015	Time series data, ADF test and VAR model was applied.	in short run inflation had positively influenced on bank credit
Wei	impact of population migration on urban housing prices in 32 major cities of China.	2018	Panel data, Cointegration test, endogeneity test, and Hausman test	population aging from 25 to 34 in urban areas had significant effect such as working age population on housing demand**.**

Table 2.3 Summary of literature review (Pakistan)

Author Name	**Topic**	**Year**	**Data, Methodology &Technique**	**Conclusion**
Zaki	housing condition of Pakistan	1981	Data from housing economic and demographic (HED), OLS, 2SLS	low housing growth rate coupled with high population growth rate that produced residence intimacy level which falls over the time
Ghaus & Pasha	housing demand in Pakistan	1988	Secondary data, OLS,	The housing shortage has declined by more than 24 percent between 1960 and 1980.
Ghaus & Pasha,	magnitude of housing shortage in Pakistan	1990	Descriptive analysis	during the period between 1960 to 1980 per capita housing shortage was declined by 24% in country.
Lodhi & Pasha,	housing demand in developing countries in the case of Karachi.	1991	Socio-economic and Demographic Survey	findings concluded that current income elasticity was less than the permanent income elasticity.

			sample household data. Box-Cox technique	
Pasha & Butt	demand for housing attributes in Pakistan	1996	Time series data. Rosen (1974) model	It found income elasticities of demand for housing attributes are relatively low in Pakistan.
Ahmad et al	demand for housing in province in Sindh (Pakistan).	2002	survey of Sindh household data,	in case of owners of house in terms of percentage of income which spent on housing has statistically significantly greater than renters.
Ahmad & Azim	socio-economic implications of changing demographic trend in Pakistan.	2008	Qualitative data, phase diagram was used.	from 1950 to 2000 period percentage of young dependents has been raised and that of old dependents has been falling.
Azim & Ahmad,	relationship between changing demographic trends and housing market in country	2010	Time series data, Mankiw and Weil (1998) model	They found that youthful demographic pattern raised demand for housing in the country as young.
Ahmed,	empirically analyzed the housing demand in urban areas of Pakistan	2015	Time series data Probit and hedonic rent model were estimated	permanent income increased then housing demand grown in urban areas
Fariha et al	housing affordability in developing countries perspective and recommendation for Pakistan.	2018	Qualitative data was used.	Pakistan has a great impact on housing demand because it's provided subsidized rental housing facility.
Siddique et al	Demand for housing in Pakistan (Urban Areas)	2018	2-step Heckman was used.	Household head age as increased also showed positive effect on demand for housing.

CHAPTER 03

THEORETICAL FRAMEWORK, MODEL, AND METHODOLOGY

We can draw a conclusion on the basis of literature review that housing demand is determined by various economic and demographic factors. The demographic factors have also significant role in developing nations along with economic. So, the task of this chapter is to develop a theoretical foundation of housing demand in terms of demographic factors. Moreover, we also try to link these factors in case of Pakistan (Azim & Ahmad, 2010).

In perspective of microeconomic theory, an economic agent makes rational decisions to maintain or gain the optimal value of goods and services that provides him/her maximum level of utility or satisfaction. In static analysis, a consumer is supposed to choose optimal level of commodity among the available alternatives in such a manner that maximum satisfaction gained from that particular commodity. While in case of dynamic analysis of consumer behavior, we have to analyze the intertemporal behavior. It is because over the time preferences regarding consumption and leisure are not remain same. The most essential aspect of this segment is that how a consumer substitutes leisure and consumption over the passage of time. In empirical analysis the functional form is really matters. If a function is in additive form, then the nature of interdependence between consumption and leisure entirely changed. On other hand, when form is multiplicative then there is strong cross dependence between consumption and leisure. Such form also reveals the Cobb-Douglas preferences (Sophocles & Alexandros, 2017). In consumer theory of demand structure arises because the consumer's choice sets are assumed to be defined by certain prices and the consumer's income or wealth.

Consumption is an important in human life as well as leisure has a large part to play in their lives where they take up rest, comfort, pleasure and enjoyment with families. Human wants to make use of these facilities so that leisure demand is generated, and it depends on demand for housing. Age distribution is a significant demographic factor that needs to be considered when assessing a country's housing demand. To analyze of leisure, however, provides an opportunity to critique main-stream economic analysis as well as contributes towards our understanding of an important facet of modern economics. Downward (2004) the economic developments which made a general

sharing of leisure possible, together with higher material levels of living, were a marked increase in productivity and an increase in the size of the labor force relative to the population. Gains in leisure were made under the market system by deliberate choice of workers for more free time even at the sacrifice of possible greater gains in real income (Surdam, 2005).

On other hand, at macro level housing demand and supply are affected by business cycle fluctuations. Economic activities at aggregate level determine the real estate and house market. There is plethora of empirical literature that discusses the bidirectional relationship between macroeconomic indicators and housing demand (Burns & Grebler, 1976);(Renaud, 1980); (Ferchiou, 1982); (Linneman, 1990).Security, location, and mobility convenience, are also other determinants of housing demand (Jimenez, 1982);(Zorn, 1986);(Jimenez, 1991); (Lim et al., 1980);(Tipple & Willis, 1992); Strassmann, 1982); Strassmann, 1991); Weinberg et al., 1981). There are also other financial indicators that play vital role in housing supply and demand and cities are built the way they are financed and how related institutions interact with market forces (Bertaud & Renaud, 1995; Struyk & Turner, 1986).

3.1 Model

In this section we are going to explain the specification of microeconomic theory such as consumer theory into a functional form. We use Mankiw & Weil, (1989) model. Then convert this functional form into an econometric model for further analysis. Here is the utility function of representative household and it depends upon consumption and leisure. C_i indicates the vector of all goods of household and l_i captures the leisure. Which is demand of house of representative household indirectly. If our representative household want to maximize his/her utility, then the objective function in household is as follows.

$$U_i = u\,(C_i, L_i) \tag{3.1}$$

$$Li = l\,(H_i) \tag{3.2}$$

The subjective function or subject to constraint

$$CP_c + HP_H = M \tag{3.3}$$

Where *C* is vector of all goods and P_c is general price level or inflation. "*H"* is house, and P_H is price of house, or we can write above equation as follows. M is total monetary resources of household.

By holding price level constant, if monetary resources or real income are increasing then household will increase its demand of house and consumption items or in other terms household enjoy more leisure and consumption and maximize her utility.

$$\text{Max } U = \text{U}\ (C_i, L_i) + \lambda\ (\text{M-}P_c C\ \text{-}P_H \text{H}) \tag{3.4}$$

Then taking first partial derivatives with respect to C, H, we get

$$U_C - \lambda\, P_C = 0 \tag{3.5}$$

$$U_l - \lambda\, P_H\, (\frac{dl}{dh}) = 0 \tag{3.6}$$

$$\text{M-}P_C\ C - P_H\ H = 0 \tag{3.7}$$

Through solving the equations (3.6) to (3.8), we obtain optimal quantity of variables C and H are given as follows

$$\text{C*= C*}\ (P_C, P_H, M)$$

$$\text{H*=H*}(P_H, P_C, M) \tag{3.8}$$

Now substituting optimal quantities such as C* and H* into the objective function in (5.1) to get indirect utility function.

$$\text{U*}(P_C P_H\ M) = UC * (P_C P_H\ \ M), H * (P_C P_H\ \ M) \tag{3.9}$$

Above equation (3.10), the indirect utility function, which are showing maximum value of the utility that a household from optimal consumption of shelter house and all other goods of basket. Since we know that marginal utility of leisure is again the function of house, therefore according to the equation (3.10).

$$U *_L\ (L) = U_L(C * (H), L \tag{3.10}$$

In view the relationship between consumption items, housing demand and leisure two assumptions are formulated. Firstly, we assume that leisure reduces the marginal utility of consumption and thus increases his or her total utility. Secondly, for leisure, consumption and housing demand will be increase. Here, we know that with the increase in leisure, then the marginal utility of consumption and housing demand decreases, therefore, $U_{LC} < 0$ and hence for equation to hold $\frac{\partial UC*}{\partial L} < 0$.

In following equation, we use additional variables in form of different age brackets (demographic factors) that have significant impact on housing demand at macro level and at micro level (Shah & Khan, 2020; Yuanliang & Zongyi, 2005).

$$Li = l\ (H_i) \qquad (3.2)$$

$$Hi = h\ (income, age\ of\ household\ members, inflation\ , unemployment) \qquad (A)$$

The theocratically micro-foundation discuss in above lines. Housing demand matters for utility maximizer household. There are some limitations when we convert this micro base model into time series analysis. Like over time data of housing price, locality, quality and area or size of house all matters for utility function.

Where HD is dependent variable, and it is housing demand. In case of Pakistan the direct information regarding housing demand or production or consumption over the time is not available for the time being. So, we have to use some proxy variable to envisage it. We use schedule banks advances for real estate purposes as a proxy variable. Further real estate is classified into land and buildings and buildings are subcategorized into residential and non-residential groups (SBP, 2018).

$$HD_t = \beta_0 + \beta_i lnAge1_t + \beta_j lnAge2_t + \beta_k lnAge3_t + \beta_l RGDPPC_t + \beta_m UnM_t + \beta_n lnInf_{t+} + u_t \qquad (1)$$

Where,

lnAg1 = 20-34, lnAge2= 35-54, lnAge3= 55 and above

lnRGDPPC= real GDP per capita lnUnM= male unemployment rate

lnInf= inflation rate

There is very first step to check the stationarity of variables in time series analysis is to move forecasting or dynamic analysis (Shahbaz et al., 2015).In modern economics if we are not check the stationarity of variables then results will be show spurious regression. In time series analysis there are some statistical properties to check the stationarity of variables. For statistical properties are like; constant, mean, variance and infinite covariance included.

In econometrics stationarity process of variables are easiest way to analyses (Palachy, 2019). There are different reasons to check the stationarity. If series shows non-stationary, then it is lead to under consideration for the time period. Sometime in such case, due to non-mean reversion property time series behavior cannot be generalized on other time series. In other words, stationarity is a vital concept for actual and reliable econometrics model. If we are ignoring this concept in modern economics, then the result will be show spurious regression and poor to understand. Meanwhile such model will be giving ambiguous results then the conclusion of the study will theoretically and empirically wrong. Apart of this importance of stationarity is the greatest reason to define in time series (Jalil & Rao, 2019).

3.2 Methodology

The main aim of contemporary study is to check the effects of demographic and macroeconomic variables on housing demand in Pakistan case. For this, we have to use the dynamic modeling approach to estimate the model. In this modeling approach, testing hypothesis, investigating economic relationships, and validating economic theories are the main concerned elements. In time series analysis stationarity test is the primary phase to appropriate estimate. There are different tests are measured in stationarity series. According to present study, we are going to check the stationarity of variables by two methods. Firstly, Augmented Dickey Fuller (ADF) test is estimate. Secondly, Phillips- Perron (PP) test is use for stationarity of variables. In small data by use of these two tests which shows higher autocorrelation order efficiently. There are three parts of ARDL analysis; a) Bound testing, b) Long run parameters of model, and c) Short run parameters along with dynamic stability of the model. In the last section, CUSUM and CUSUM SUM of SQUARE are also reported to check the stability of the model.

3.2.1 Augmented Dickey Fuller (ADF) Test

The foremost approach estimate in unit root test is Augmented Dickey Fuller (ADF) test in econometrics. The use of this main approach for stationarity of all variables to avoid poor forecasting and ambiguous results. The most advantage of ADF test use it can easily estimate a larger and complex model. Apart of this, in hypothesis test there is unit root for null hypothesis. Although in the alternative hypothesis is dependent on different types of equation which is used, but it mostly stationary and trend stationary.

In modern econometrics, autoregressive AR (1) model is as good considered. It may be suffering from unit root. For AR model one or more lagged values of the exogenous variable is contain along endogenous variable so it is called as an autoregressive model (Ng & Perron, 2001).

$$Y_t = \propto_0 + \rho Y_{t-1} + \mu_t \qquad (3.11)$$

According to above equation (3.11)is AR (1) process,

where,

Y_t is previous value

$\propto_0$ is an intercept constant

ρ is the coefficient presenting process unit root.

μ_t is residual term

In (Engle & Granger, 2015) examined for stationary series, if the value of ρ shows less than one and Y_t shocks will be temporary effect and will die out with the passage of time. Additionally, if the value of shows equal to one then Y_t shocks will be permanent in nature. In this scenario, the series suffer from unit root. If it shows greater than one then the series will explode (Ratha, 2003).Moreover , the main problem with this equation is that assumption is presence of stationary, that's the reason is that equation has been estimated at level. Hence, we can rewrite the model at first difference, and it will be as follows:

$$y_t - y_{t-1} = \propto_0 + \rho Y_{t-1} - y_{t-1} + \mu_t \quad (3.12)$$

$$\Delta Y_t = \propto_0 + (\rho - 1) Y_{t-1} + \mu_t = \alpha_0 + \delta Y_{t-1} + e_t \quad (3.13)$$

Where;

δ is the coefficient of gross output

As above equation (3.13) we assume that the series is nonstationary process, accordingly model is estimated at differences form. Here, the same method was applied by Dickey and Fuller (Mushtaq, 2011). These two tests are only deal with AR (1) it shows limitation of method.

Here, we assume that series is non-stationary, so, the model is estimated in differences form. If value shows less than zero, Y_t shock will be temporary and will die out with the passage of time(Pesaran et al., 2001).In this scenario the series will be integrated or stationary in process. Secondly, if value shows equal to zero, Y_t shocks will be permanent in nature and do not die out with the passage of time (Pesaran et al., 2001). In this case the series showed as unit root. So, this is called unit root hypothesis.

$$\Delta Y_t = \propto_0 + (\rho - 1) Y_{t-1} + \mu_t = \alpha_0 + \delta Y_{t-1} + e_t \quad (3.14)$$

$$\Delta Y_t = \propto_0 + a_{1t} + (\rho - 1) Y_{t-1} + e_t \quad (3.15)$$

Where

a_{1t} is time trend

Hence, Dickey Fuller test only deal with AR (1) method. But mostly in time series are suffering from AR (ρ) method. To integrate the high order of autocorrelation is utmost suitable method is Augmented Dickey Fuller (ADF) test. Here, the equation of ADF is written as

$$\Delta Y_t = \propto_0 + a_{1t} + \delta Y_{t-1} + \Sigma_{j=2}^{\rho} \alpha_i Y_{t-j} + e_t \quad (3.16)$$

Above equation (3.16) shows Augmented Dickey Fuller (ADF) (Engle & Granger,2015).Additionally, one has been argued that if intercept and trend as above equation are ignored then estimation results are not strong/robust condition (Rummel, 2015).It is true and

logical reason of criticism and have to be careful analyzed. Thus, we are adding intercept and trend and the model as written in equation (3.15) and (3.16).

Augmented Dickey Fuller (ADF) test is preferred. Because it parametrically modifies the higher order correlation by taking higher number of lags on the right-hand side of the equation. Besides, addition of a greater number of lags on the right-hand side is normally considered a practical approach in above equation. In applied econometricians mostly advice that researcher should include sufficient number of lags in model to remove autocorrelation in the residuals (Jalil & Rao, 2019). But sometimes it is not convenient because with inclusion of lags, loss of degree of freedom happens. The other limitation of ADF is that it does not incorporate any structural changes in the data series under consideration.

3.2.2 Phillips-Perron Test of Unit Root

In a general time -series there is an alternative method used for testing the presence of unit root. This test applied for autocorrelation problem and it proposed by (Phillips & Perron, 1988).In case of small data with high order of autocorrelation then the regressors too much effect on degree of freedom. PP test is most preferred as compared to ADF. PP test is popular in the time series analysis .it differ from ADF because mostly it deals with the serial correlation and heteroskedasticity in the errors term. In the test regression PP test also avoid any serial correlation. Advantage of PP test is robust to general forms of heteroskedasticity in the error term (Levendis, 2018).

3.2.3 Co-integration Regression

In time series analysis, the use of stationarity refers the concept of co-integration. Cointegration test shows that variables are integrated as same order and linear combination for non-stationary. It also shows long run relationship among variables. By use of this concept observed that the nonstationary variables are co-integrated or not co integrated with each other. This test clearly used for avoiding spurious regression in the model. After the unit root test there are different procedure to use cointegration tests. For example, if variable shows stationary, then the data set shows I (0) which means variable integrated at level. Additionally, if the variable shows nonstationary at level, then we are going to next step on first difference for make variable to stationary. After this procedure if the data set shows stationary at first difference I(I) then we can it integrated at first level. The data set might be stationary at second difference then I (2) it is called

integrated at second level. If all the series shows like I (0) then we use simple OLS or a linear regression for estimation. But, in the particular case short run and long run coefficients are check in method. If the data series shows some are integrated at I(0) at level and some are I (I) first difference . On this scenario we can go to Autoregressive Distributed Lag (ARDL) model for estimation.

3.2.4 Autoregressive Distributed Lag

Autoregressive Distributed Lag (ARDL) approach was proposed by (Pesaran & Shin, 1995)**.** This method applied for check the long run relationship, cointegration or bound test. While the variables are stationary at I(0) , I(I) and could be combination of both integrated. The use of ARDL application to co-integration that give realistic and efficient estimates in the series. This approach also helps to find the co-integrating vectors. In case of small sample (Pesaran & Shin, 1995) argued that the ARDL approach to co integration gives the robust results and super consistent estimates for the long run coefficients. This ARDL approach has gained wide acceptance due to use of various econometrics advantages of other cointegration methods(Mahmood et al., 2010).

In case of one co-integrating vector is identified then the ARDL approach to the co-integrating vector is reparametrized into the ECM. On other side, given the dependent variable this test helps to identify the underlying variables whether co-integrated or not in the model. General model Johansen & Juselius (1990) is discussed below.

$$\omega(L,p)y_t = \sum \beta i\,(L,q_i)x_{it} + \gamma v_t + u_t \qquad (3.17)$$

where;

$$\omega(L,p) = 1 - \omega_i L - \omega_2 L^2 \ldots . \omega_P L^p \qquad (3.18)$$

$$\alpha(L,q) = 1 - \alpha_1 L - \alpha_2 L^2 - \ldots . - \alpha_q L^q, for\ i = 1,2,3, \ldots . k, u_t \sim iid(0;\gamma^2) \qquad (3.19)$$

As above equation L shows lag operator such that $L^0\ y_t = x_t$, ,$L^1\, y_t = y_{t-1}$,and is a x1 vector is intercept term used, exogenous variables or seasonal dummies with the fixed lags P=0,1,2…, m, q=0,1,2…., m, i=1,2…., k: namely a total of different ARDL models. Sample period, t = m+1,

m+2…., n. Besides, the selection of optimal lags length, in Akaike Info Criterion (AIC) and Schwarz Criterion are selected for avoid an autocorrelation between error terms.

3.2.5 CUSUM and CUSUMSQ Test

Brown & Evans, (1975) proposes the Cumulative Sum of residuals (CUSUM) and second Cumulative Sum of recursive residuals of squares (CUSUMSQ) tests. These two tests are applying for parameters reliability to the linked in a linear regression. In another words, these are used for stability of parameters. According to CUSUM and CUSUMSQ tests result must be show in a straight line of 5% at significant level.

In this section, we discuss the conceptual framework between housing demand, Demographic variables with different age brackets and another macroeconomic variable such as real GDP per capita, male unemployment rate and inflation rate. Cobb-Douglas function used. In this study data is collected from Economic Survey of Pakistan (ESP), State Bank of Pakistan (SBP) and World development Indicator (WDI). In this chapter we firstly discussed Unit root test. For check the series stationarity Augmented Dickey Fuller (ADF) test and Phillips- Perron (PP) test is applied. Next step is applying the ARDL approach for short run, long run parameters and bound test. Last checking the CUSUM and CUSUMSQ for stability of parameters in model.

3.3 Data and Variable Description

As discussed above, the study uses secondary data from 1980 to 2020 in Pakistan. In case of Pakistan the direct information regarding housing demand over the time is not available for the time being. So, we have to use some proxy variable to envisage it. We use schedule banks advances for real estate purposes as a proxy variable. Further real estate is classified into land and buildings and buildings are subcategorized into residential and non-residential groups (SBP, 2018).The data of housing demand, dependent variable will be taken from State Bank of Pakistan SBP .The data of demographic variable is taken from Economy Survey of Pakistan (various editions). Secondly macroeconomic independent variable such as real GDP per capita, male unemployment rate and inflation rate is collected from Economy Survey of Pakistan (various editions) or World Development Indicators (WDI).

Table 3.1 List of Variables and Data Source

Dependent Variable		
Housing Demand	Schedule banks advances Annual Million Rupees for real estate as proxy	State Bank of Pakistan
Explanatory (independent) variables		
Age group 1 (20-34 year)	Millions	Economy Survey of Pakistan
Age group 2 (35-54)	Millions	Do
Age group 3 (55 and above)	Millions	Do
Real GDP per capita	In Local Currency Unit	WDI
Male unemployment rate	In percentage	Do
Inflation	In percentage	Do

As study uses annual inflation rate that measures through CPI. If we use interest rate, then there may be issue of multicollinearity between inflation and interest rate through the channels of Fisher equation. At last, study uses unemployment rate as a control variable and same unemployment rate is real variable to capture the economic fluctuations of economy overtime.

CHAPTER 04

RESULTS AND DISCUSSION

4.1 Introduction

This chapter is backbone of this study because it is focusing on analysis and interpretation of results. Results are based on model and methodology that we discussed in the previous chapter. The organization of this chapter is as follows, in section 4.2, we report unit root tests (stationarity level) of all variables of our model by employing Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests. Then in section 4.3, on the basis of ADF and PP tests, the study applies ARDL approach to estimate the model. There are three parts of ARDL analysis; a) Bound testing, b) Long run parameters of model, and c) Short run parameters along with dynamic stability of the model. In the last section, CUSUM and CUSUM SUM of SQUARE are also reported to check the stability of the model.

Study provides descriptive statistics of our data before estimating the regression and discuss some inferential aspects of sample. In following Table 4.1, basic descriptive statistics of central tendency such as mean, measure of dispersion like standard deviation are reported. Moreover, study also checks the normality through Jarque- Bera. The mean value which shows the average value of the series. In demographic factors the mean values of lnAge1, lnAge2, and lnAge3 are 5.38, 5.4 and 5.19, respectively. The measure of dispersion such as standard deviation which shows how data deviate from its mean. Skewness statistics asymmetric of the distribution of the series around its mean. In kurtosis statistics measures the peakness or flatness of the distribution series. In column 5 which set the values less than 3 in demographic factors, lnRGDPPC and lninf shows platykurtic (flatted- curve) distribution. But in case of male unemployment rate the values of Kurtosis is greater than 3 which is 3.65 value that represent the Leptokurtic (peaked curve) distribution. To check the normality, we see the probability value of Jarque Bera test. In last column, the probability values of all variables are greater than 5 percent represent that series are normally distributed. On the other variable lnUnM which are less than 5 percent that represent the series are not normally distributed.

Table 4.1 Descriptive Statistics

Variables	Mean	Std. Dev	Skewness	Kurtosis	Jrq-Bera	Probability
lnAge 1	5.382138	0.046029	0.227351	1.45604	4.317613	0.115463
lnAge 2	5.454674	0.057338	0.221344	1.700211	3.142375	0.207798
lnAge 3	5.192441	0.038086	0.151288	1.793878	2.577135	0.275665
lnRGDPPC	10.67509	0.20742	0.14744	2.180681	1.263723	0.531601
lnUnM	1.001868	0.755384	-1.33743	3.651341	12.63181	0.001807
lnInf	1.96599	0.502361	3.009937	-0.25572	2.250759	0.503703

4.2 Unit Root Tests

In time series data analysis, checking the stationarity of each series is an essential feature in modern-day data science just to avoid from spurious regression. However, there are many tests available to check the stationarity according to nature of data. But here in this study, we opt only two tests namely, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP). ADF test provides asymptotically efficient and consistent outcomes. While Phillips Perron test is relative efficient test for checking the stationarity of small data. These tests are widely used for housing demand like; (Adams & Füss, 2010; Choi & Painter, 2015; Ma et al., 2015; Korkmaz, 2019; Malpezzi, Mayo, & Gross, 1987; Mcfadden, 1994). In below Table 4.2 estimated values of ADF unit root test are presented of each variable at level and first difference separately. All variables are unit root free at different levels. Housing demand (lnHD) is dependent variable of our model and it is stationary at level or in other words it is integrated at level. The other key variable is demographic group that we divide into the three different age brackets. The first age bracket (lnAge1) is from 20-34 years which is stationary at first difference of ADF. Second age bracket (lnAge2) is from 35-54 and it is also integrated at first difference. The last and third age bracket(lnAge3) is age of 55 years and above and it is also suffering from unit root at level, but its first difference is stationary. There are three supporting macroeconomic variables in our model, and all are stationary

at first difference. These are real GDP per capita at first difference, male unemployment rate (lnUnM) in percentage also stationary at first difference. The last macroeconomic variable is natural log of inflation rate (lninfl) and it is also stationary at level.

Table 4.2 ADF Test

Variables	Augmented Dickey-Fuller Test Statistics					
	Level with Intercept			1st Difference with Intercept		
	t-statistics	t-critical	P value	t-statistics	t-critical	P value
lnHD	-3.20	-2.93	0.02*	-5.68	-2.94	0.00*
lnAge 1	-0.76	-2.93	0.81	-7.57	-2.94	0.00*
lnAge 2	-0.28	-2.94	0.91	-3.90	-2.94	0.00*
lnAge 3	-1.63	-2.93	0.45	-6.07	-2.94	0.00*
lnRGDPPC	-0.98	-2.94	0.74	-4.04	-2.94	0.00*
lnUnM	-1.84	-2.93	0.35	-5.67	-2.94	0.00*
lnInf	-4.63	-2.95	0.00*	-6.60	-2.94	0.00*

Note: * indicates variables are stationary at 1 %.

After checking the unit root through ADF test, now we proceed PP test which is well known test in economics time series analysis. There are many studies those used this test like; (Yang et al., 1984; Ni, Huang, & Wen, 2011; Yusof et al., 2018).To check the stationarity of variable in first column of Table 4.3 presents the variable name and first variable is housing demand (lnHD) that is also dependent variable which is again stationary at level. The three brackets of demographic variables are also stationary at first difference. On other side, three macroeconomic variable such as real GDP per capita, male unemployment rate and inflation rate are stationary at first difference.

Table 4.3 PP Test

Variables	Phillips-Perron Test Statistics					
	Level with Intercept			1st Difference with Intercept		
	t-statistics	t-critical	P value	t-statistics	t-critical	P value
lnHD	-3.18	-2.93	0.02*	-5.68	-2.94	0.00*
lnAge 1	-0.65	-2.93	0.84	-7.79	-2.94	0.00*
lnAge 2	-0.15	-2.93	0.93	-9.15	-2.94	0.00*
lnAge 3	-1.78	-2.93	0.38	-6.07	-2.94	0.00*
lnRGDPPC	-1.34	-2.93	0.59	-4.04	-2.94	0.00*
lnUnM	-2.06	-2.93	0.26	-5.67	-2.94	0.00*
lnInf	-2.75	-2.93	0.07	-6.06	-2.94	0.00*

Note: * indicates variables are stationary at 1 %.

ARDL approach was proposed by (Pesaran & Shin, 1995). It is applied in the modern era of economics for finding cointegration among variables. When we have some variable(s) integrated at level and some are integrated at first difference then ARDL is best option to estimate model. Basically, ARDL is an addition in Ordinary Least Square (OLS) family. As we know the basic purpose of OLS is to minimize the residual sum of square of model. But ARDL takes appropriate numbers of lags to estimate the model by opting general-to specific modeling framework. In Table 4.4, presents the ARDL bounds testing calculated values along with critical values of lower bound and upper bound. The calculated value in form of F-statistic is 19.21 and it is higher than the critical value of upper bound. So, we can reject the null hypothesis or fail to accept null hypothesis at one percent level of significance. In simple words, the null hypothesis states that there is no long run relationship exists among variables of the model.

Table 4.4 ARDL Bound Test for Cointegration

	Value	K
F-statistics	19.218	6
Critical Values for bound test	I (0)	I (1)
10%	2.12	3.23
5%	2.45	3.61
1%	3.15	4.43

After checking the stationarity of each variable, we find the strong evidence of cointegration through bound testing, now we are going to estimate the long run and short forms of ARDL. Many empirical studies use this approach for such estimation (Adams & Füss, 2010; Chen et al., 2016; Irandoust, 2019; Keil, 2017; Lindh & Malmberg, 2008; Mei et al., 2017; Ohtake & Shintani, 1996). In following Table 4.5, we present the long run form of ARDL. Where, first age bracket (lnAge1) is statistically significant because the t-value is 4.660 which is greater than 2. In this study result young age group has more housing demand in Pakistan. The second age bracket (lnAge 2) has negative impact on housing demand, but it is statistically significant at 12 percent level of significance reason is that economic factors. There are many other studies in which same negative relationship exist between a specific age group and housing demand. Dipasquale & Wheaton, (1994) expalined that during the period of 1990s aging was acting as a negative shock for housing demand which observed in single household formation was slower to demand for housing. According to Goodman, (1990) studied age factor of black people have less demand for housing then whites means (race difference) and also household size may matter, but not very much. By Jumadi et al., (2010) resesrch result indicates that factor of marital status had statistically negative relationship with housing affordability. Monnet & Wolf, (2017) also explained the negative relationship in age group of 50 plus for residential investment. Vajiranivesa, (2008) result concluded that age bracket of 55-59 and above has negative effect on housing demand. Last and

third age bracket (lnAge 3) shows positive and significant impact on housing demand. Its t-statistical value is 3.291 and probability value is 0. 081. Furthermore, check the ARDL long run results between the housing demand and macroeconomic variables. According to the results, there is significant relationship between real GDP per capita (lnRGDPPC) and housing demand at 10% significant level in the long run. The coefficient of real GDP per-capita is significant and probability value is 0.102. It means 1 percent increase in real GDP per-capita then the housing demand will increase by 13.42 percent. So, we can say that there exist positive and increasing relationship between income of individuals and overall housing demand. The other macroeconomic variable is male unemployment rate (lnUnM), surprisingly it has negative and significant impact on housing demand. Its probability value is 0.039 which is less than the 5% level of significance. As we take commercial banks loan for residential investment purposes as a dependent variable, so, as rate of male unemployed increased by one percent then there are chances that commercial bank do not in position to offer loans to unemployed for residential purposes. Third macroeconomic variable is used in below table 6.4 is inflation rate (lnInf), it indicates the negative relationship between housing demand. The coefficient of inflation rate is significant, and its probability value is 0. 061.This P-value is less than the significant level at 10 %. So, 1 percent increase in inflation rate then the housing demand will decrease by 1.129 percent in the long run. Housing demand is durable goods which means it depends on long run and it takes negative relation with inflation instead of short run. Many studies like (Manchester, 1987; Helmenstein et al., 2001; Tripathi, 2019; Follain, 1981; Feldstein, 1992; Ma et al., 2015; Korkmaz, 2019) argued that the negative link between inflation and HD. On the other side, R-squared value is 0.999 and adjusted R-squared value is 0.998 both values tell us the goodness of fit of our model. It is power of the independent variables to explain the variation in dependent variable of model. Akaike and Schwarz info criterion show negative values (-4.262) and -2.767, respectively. In Durbin-Watson test, if it's value less than 2 so we have positive autocorrelation. If its value greater than 2 then we can say there is negative autocorrelation and another meaning if value is equal to 2 then we call, there is no auto correlation. According to Durbin- Watson test result 2.420 value indicated that there is negative autocorrelation in the model. Prob F-statistics shows combine effect of all independent variables on dependent variable. The value of Prob F- statistics 0.001 which is less than 5 % this indicates that the combine effect is significant. Breusch-Godfrey Serial Correlation LM test is used to detect the autocorrelation problem or not in model. The advantage of this test

is used to detect the high order of autocorrelation problem and lagged dependent variable in the model.

Table 4.5 ARDL Long Run Results

Values	Coefficient	T-Statistics	Probability
Constant	-183.397	-18.035	0.003
lnAge1	45.316	4.660	0.043
lnAge 2	-86.356	2.646	0.118
lnAge 3	53.925	3.291	0.081
lnRGDPPC	13.420	2.880	0.102
lnUnM	-0.932	-4.880	0.039
lnInf	-1.129	-3.833	0.061
R-squared =0.999		Durbin-Watson= 2.420	
Serial Correlation LM = 0.377 (P value)		Adjusted R-Squared=0.998	
Schwarz Criterion= -2.76		F-statistics= 702.368	
Akaike info criterion= -4.26			

In Table 4.6, the short run form (Error Correction Mechanism, ECM) is presented. In short run demographic groups matter for housing demand. If first age bracket (lnAge1) is increase by 1 percent, then housing demand will be increase by 3.015 percent. For second age bracket if (lnAge 2) increase by 1 percent then housing demand will be decrease by -37.66 percent. Last age bracket if (lnAge 3) increase by 1 percent then housing demand will be increase by 20.125 percent in Pakistan. Furthermore, in study used the macroeconomic variables are also estimate in the short run of ARDL such as real GDP per capita, male unemployment rate and inflation rate. If real GDP per capita (lnRGDPPC) increase by 1 percent, then housing demand will be decrease by around eight percent in short run. Because income no matter in short run. But on the other side if male

unemployment rate (lnUnM) increases by 1 percent then housing demand will be increase by 0.66 percent. In the short run result if inflation rate (lnInf)is increase by 1 percent then housing demand will be increase by 0.55 percent in Pakistan. The sign of coefficient of lagged ECM term is negative and significant.

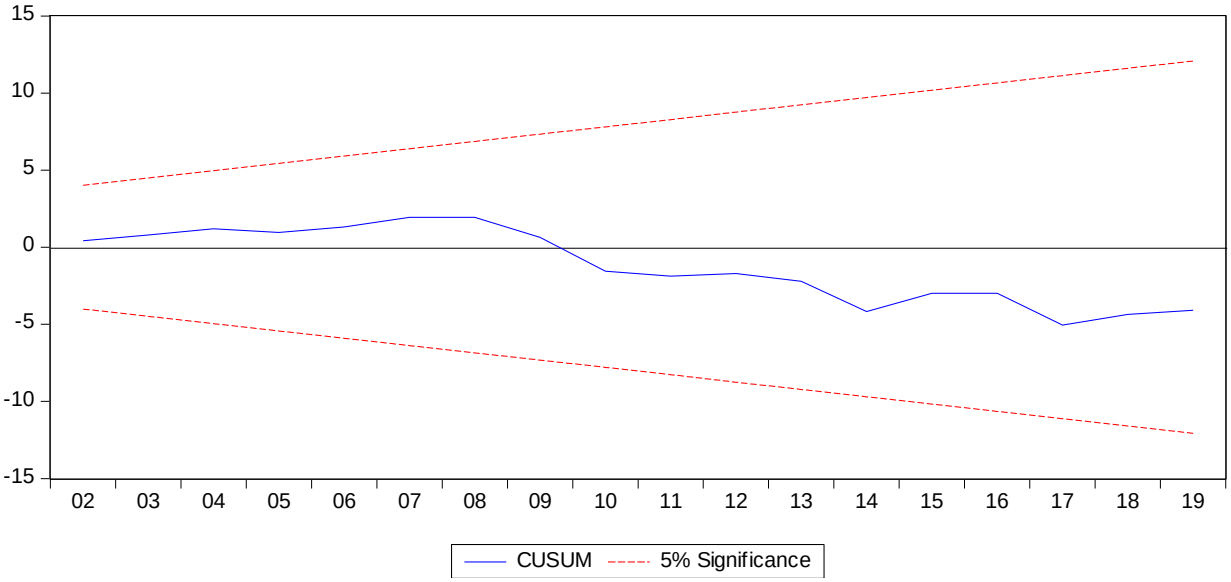
Table 4.6 ECM Results

Values	Coefficient	T-Statistics	Probability
Constant	-243.944	-4.104	0.054
D (lnAge1)	3.015	1.173	0.361
D (lnAge 2)	-37.66	-4.151	0.053
D (lnAge 3)	20.125	5.075	0.036
D (lnRGDPPC)	-8.236	-1.666	0.237
D (lnUnM)	0.699	3.136	0.039
D (lnInf)	0.551	4.596	0.038
Ecm_{t-1}	-0.712	-3.362	0.037

4.3 Cumulative Sum Test

In modern economics, Cumulative sum (CUSUM) test was proposed or introduced by (Brown, Durbin & Evans, 1975) researchers. (CUSUM) test is used to examine the stability of long and short run parameters. In Figure A shows the result between the critical boundaries at 5 % level of significance. CUSUM dot is fall between the range of red straight line at 5% significant level It reveals that the parameters are stable overtime.

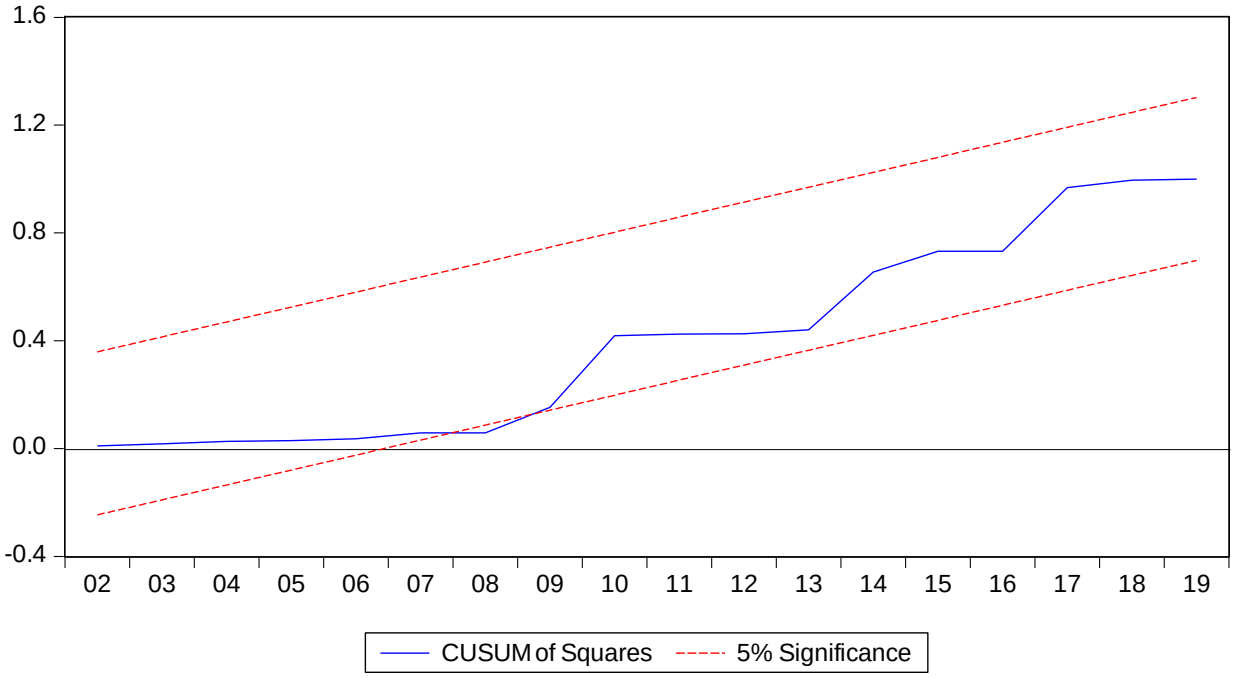
Figure 4.1 Cumulative Sum



4.4 Cumulative Sum of Squares Test

In below figure B shows Cumulative Sum of Squares (CUSUMSQ) test result. CUSUM Sum Square test dot is actually fall among red straight line.

Figure 4.2 Cumulative Sum of Squares



In the same way unemployment result shows positive or direct link with HD. These results of the study are supported as like previous research (Choi & Painter, 2015; Helmenstein et al., 2001).

CHAPTER 05

Conclusion and Policy Recommendations

In this chapter we are going to conclude the study and suggest some policy recommendations based on our findings.

At micro level housing demand is derived demand for leisure. As we know, in microeconomics, individual maximize his or her utility by choosing optimal level of working and leisure hours, while housing is basic ingredients for leisure. If we talk about macro aspects of housing demand, then residential investment is considered as a leading indicator of business cycle. Generally, applied economists believes that present behavior housing demand in any economy can predict the future of output. The situation of housing demand is very different between developing and developed nations. In chapter one, we have discussed the housing demand in developed and developing nations. The core objective of this study is to estimate the impact of different aging groups (demographic factors) along with selected macroeconomic variables on housing demand in case of Pakistan. Schedule bank advances for real estate is taken as a proxy of housing demand in Pakistan. The exact information about housing demand or housing production is not available in case of Pakistan. So, the contemporaneous study takes the proxy of housing demand.. Demographic indicator is divided into three age brackets. First age bracket is total population from 20 year to 34 years, second bracket from 35years to 54 years and third age bracket is 55 and above. Study do so because these brackets have different impact on housing demand due to potential and momentum of each group. Three macroeconomic variables are also taken as independent variable that play incredible role in shaping the demand function of house. These are real GDP per-capita, male unemployment rate and inflation rate. In this research, time series data are used from 1980 to 2019 and data is collected from various authentic sources of Pakistan.

In segment of data analysis, we apply two separate unit root tests to check the stationarity of variables for robust results. ADF and PP test confirms the mix order of cointegration like I(0) and I(1). After checking the stationarity by unit root tests, bound testing approach is applied to check the cointegration. In present study the bound test indicates the presence of cointegration among housing demand, demographic indicators and macroeconomic variables. Then ARDL approach is applied to check the effects of demographic and macroeconomic variables on housing demand. In long run, first age bracket from 20 to 34 years and third age bracket from 55 years to onward show

significant and positive impact on housing demand. But on other hand side, the second age bracket from 35 to 54 years shows insignificant but negative impact on housing demand of Pakistan. In addition, real GDP per-capita and male unemployment rate shows statistically significant and positive impact on housing demand. In present study, other macroeconomic variable such as inflation rate shows significant but negative relationship with housing demand.

Furthermore, in short run analysis the demographic first and third age brackets show positive and significant result. While second age bracket (35-54) shows negative result, similar in long run analysis. In macroeconomic variables, real GDP per-capita showed statistically significant but negative relationship with housing demand. Other macroeconomic determinant male unemployment rate and inflation rate showed positive and significant results. Our model qualifies the yest of dynamic stability.

5.1 Policy Recommendation

In advanced countries, research experience has identified the relationship between housing demand and demographic (age structures). Pakistan is a developing country, and it has 66 percent youth population that lies between the age of 0 to 30 years. In this scenario, it phases the demographic transitions when youth generation entering into the phase of working field. Secondly, young population getting married mostly aims to lives separately and independently. Mostly joint family system is followed by independent living. Then these two predictions indicates that housing demand will increase in the next few years. So, government should incorporate these age brackets that will become an attraction for help to increase the housing demand.

In Pakistan, middle class is badly experiencing the lack of efficient houses. Mostly low or middle-income groups face the problems of gaining land and construction of their houses. Hence an increasing household size of specific age group having no choice to buy new home because of inflation. Government should provide simple loans to the low- or middle-income age brackets. It would help them to purchase land and construct house building. It needs to be a very careful planning for long term analysis because during this, high proportion of young population will be entering the new working phase. Government should incorporate the role of different age groups in housing demand and take actions through the “NAYA PAKISTAN HOUSING PROJECT”. This present study throws light on ways for increasing the housing demand in future.

In formal financial institutions such as House Building Finance Corporation (HBFC) (1952), commercial banks (2003). They are serving very small contribution with stringent regulations to the housing finance in Pakistan. Government should intervene in the financial sector and make useful and good strategies for consumer housing demand. Moreover, government should take an action for fraud activities and give feasible finance procedure to concerned public so that to improve their standard of living.

Unemployment rate is increasing with the passage of time. Pakistan is a young, populated country in the world. Education and skill are most important for human survival. It makes a good opportunity to increase or improve the GDP and economic growth of nation. So, investment in human capital will give more potential and increase the efficiency of labor which will increase the housing demand in the future. Another important attention needs to be given to the female labor force participation rate which is very low in Pakistan. Hence, government should take an action for providing protected environment and opportunities for females in work field. As such steps can be very helpful and economically beneficial to boost the economic growth of Pakistan.

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