Research Article

Exploring housing market and urban densification during COVID-19 in Turkey

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A B S T R A C T

The paper explores the housing market, urban densification, and government policy interventions due to COVID-19 in Turkey. From 1980 to 2019, the share of urban population in Turkey increased from 43.78% to 75.14% (UN DESA, 2018) and simultaneously the housing production has been increased more than 30% at the same period and it has planned to build or reconstruct about 13 million housing units including 1 million housing units per year from 2020 (Housing Development Administration of Turkey, 2020). However, COVID-19 has radically changed Turkey's real estate market, more specifically, housing market. Based on secondary data and information, the study has found that there has been a sharp decrease occurred during the month of April and May in 2020 due to curfew and other related COVID-19 controlled measures. After government interventions such as lowering interest rates in public banks, online land registry applications, government stimulus packages etc. a sharp increase happened from June and the third quarter of 2020; even after out looking 10 lowest densely populated provinces, 10 highest densely populated provinces in Turkey and districts in Istanbul. Focusing impact on the housing market in three different quarters (Q1, Q2 and Q3) of 2020 in the studied areas, it has found that there is no significant relationship between housing sales with respect to population density but government policy intervention during COVID-19 plays a very significant role in increasing housing demand.

1. Introduction

In the late 2007 and in 2008, the housing bubble deflated in the USA, the sub-prime mortgage crises were hit, and the recession was observed in the US economy. Then it has impacted the whole world economy resulting in worldwide recession called Global recession or Global Financial Crisis of 2007–2008 (Yıldırım, 2020). The global crisis hit in September 2008 was mainly a real sector crisis amidst a direct collapse in economic productivity and employment in Turkey. However, Turkish government's role regarding structural reform before the crisis and interventions the crisis makes Turkey's economy least affected (Tanrıvermiş, 2020). Though the impact of mortgage crisis is over but the world is experiencing a new crisis due to COVID-19 pandemic. However, the economists have revealed that the on-going COVID-19 crisis have also some similarities comparing to Global Financial Crisis such as uncertainty, collapse and reactions in terms of limiting shocks, monetary and fiscal policies (Strauss-Kahn, 2020).

The COVID-19 outbreak in 2020 poses a serious negative impact on human health, as a natural consequence of this pandemic, alongside other impacts the socio-economic conditions were also negatively affected due to curfews, social distancing, unemployment, travel restrictions and so on. The effect of COVID-19 seems to anticipate short, medium, and long-term effects and it will take a long time

to alleviate the effects (Adel et al., 2020). Firstly, in the short term scenario it seemed that tourism, retail and entertainment sectors are the most affected sector. In the medium-term it is thought to be the most likely to be affected by air-to-sea transport, automotive, tour-event operators, bank and insurance companies, energy companies, and these effects will be evident in office markets (Nicola et al., 2020). Now its exact trajectory seems unknown and may pose long term effects in the world economy. Therefore, unlike many countries, Turkish government has taken a number of strategic decisions and measures to overcome the socio-economic, built-environment and other related problems in different sectors (Ahsan, 2020; Tanrıvermiş, 2020). Among the leading sectors in Turkey, the housing sector is not only considered as a need but also as an investment tool. For instance, from 2000 to 2018 the building production has increased more than 30% and it has planned to build or reconstruct some 13 million housing units including 1 million housing units per year from 2020 (TÖKİ, 2020). The surplus and high interest rates observed in the real estate sector before the pandemic and a few months after starting the outbreak. In order to reduce both the surplus supply and the economic burden of pandemic, the government lowered interest rates in public banks, implemented web-based land registry applications, and provided opportunities such as dismissal bans and short-time work allowances in the private sector (Tanrıvermiş, 2020).

Urbanization, on the other hand, seems to be an indispensable risk factor for COVID-19's severe outcome including long-term impact due to live, work and interaction of people and communities together. People's choice of urban and rural areas represents the relationship between COVID-19 pandemic, urbanization and/or urban density. Density can be measured as population density, residential density, net density, gross density, workplace density etc. In this study, density is referred to as population density, meaning that density at which the average person per square kilometer lives in a specific administrative area. However, density could lead to serious public health hazards including spread of communicable diseases (Panwar & Mishra, 2020; Yang, Wang, Zhang, & Ke, 2020). It has seen responsible for spreading corona virus, as per UN Habitat report (published in April 2020), over 1430 cities in 210 countries affected by COVID-19 and over 95% of total COVID-19 cases have been found in urban areas (UN Habitat, 2020). In India, as an example, it has measured that the risk is 1.09 times and 1.89 times higher in urban areas and urban slum-like conditions respectively (Mishra, Gayen, & Haque, 2020 cited from Swarajya, 2020).

Again, density could happen in the streets, parks, workplaces, residential, industrial, commercial space. Connection of housing to the concrete place in an area is its important characteristic. In this respect, individuals are deciding about buying, choosing between quality of services connected with housing, and such better housing is vital for health during and post COVID-19. As population density vis-a-vis vertical expansion of apartments, multifamily homes in the cities has increased (Ahsan, 2020), people moves to less-storey detached houses over time and pandemic teaches to increase such interest (Şolt, 2021). However, in urban fringes, rural areas and newly developed residential areas, horizontal construction accelerates and the relationship between price and rent money changes in real estate markets with the decrease in the density of construction (Nicola et al., 2020). Such changing elements are highlighting urban dynamics perspective with a number of opportunities and challenges, and this trend can be exacerbated by the ongoing impact of COVID-19 (Avetisyan, 2020).

It has been observed from 1980 to 2019, the share of population in urban areas in Turkey increased from 43.78% to 75.14% (UN, 2018) and this share is increasing rapidly (TURKSTAT, 2020a). On the other hand, real estate markets were steady state just before coronavirus spreading time. However, it has estimated that 11.65% housing sales has increased in 2020 from the past year 2019 (TURKSTAT, 2021). Consequently, it is needed to examine the increase and decrease of housing sales with respect to population density and COVID-19 impact. The real estate and construction sectors account 12% of GDP, employing around 2 milion people showing a significant leading sahre in the economy of Turkey (TURKSTAT, 2019b). Therefore, the focus of this study is to outline the real estate market vis-à-vis urban dynamics and provide necessary solution measures for housing sector during COVID-19 in Turkey. As there is no
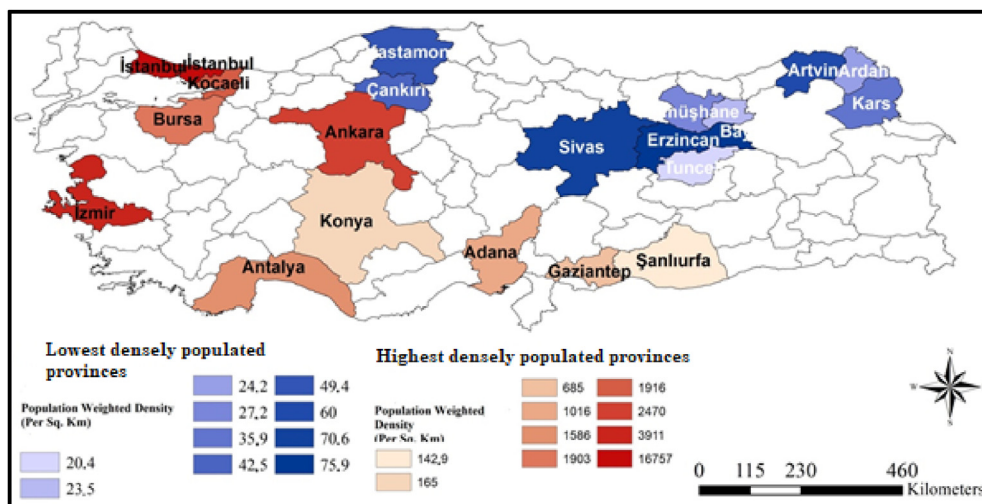

Fig. 1. Top 10 Highest dense and lowest dense provinces with respect to population-weighted density.
Source: Onur, 2020; TURKSTAT, 2020a.

previous research on this subject in the literature therefore this study aims to fill this gap in the literature and to pioneer future studies. Therefore, it is imperative to highlight the impact of housing sector along with population density in this study.

2. Methods and socio-economic profile of the study area

With frequent lockdowns field work was not possible to conduct in this study. Therefore, secondary data has been used focusing on macroeconomic outlook, general situation of real estate market, COVID-19 cases, urban densification and impact on housing market in cities. The first hand housing sales, second hand housing sales, mortgage sales, building permits, acquisition by the foreigners have been addressed in this study during Q1, Q2 and Q3 of 2020 housing market in Turkey. Major data has been carried out by government web portals such as Turkish Statistical Institute (TURKSTAT), Central Bank of Turkey (CBT), General Directorate of Land Registry and Cadastre (TKGM), Ministry of Health, and other secondary sources such as peer reviewed articles, reports and national newspapers are also included in this study.

As densification, demographic data are the main determinants of the quantitative demand for space. In this study, the effect on urbanization was interpreted with 2019 census data. This study has considered 10 highest dense provinces (Istanbul, Ankara, İzmir, Bursa, Antalya, Adana, Konya, Şanlıurfa, Gaziantep and Kocaeli) and 10 least dense provinces (Bayburt, Tunceli, Ardahan, Gümüşhane, Artvin, Çankırı, Erzincan, Kars, Kastamonu and Sivas) according to population weighted density per square kilometer and their housing market (Fig. 1). In this respect, the direction of housing sales in these provinces affected with respect to urban densification have been examined.

As the number of housing sales is high in Turkey, and Istanbul poses an economically stronger position than other provinces and with regard to population density it is ahead of other provinces, so the districts of Istanbul have been examined more closely. As most population in dense districts are also located in Istanbul and 40% COVID-19 cases have found, therefore these districts are analysed in this study to get a picture of local level situation. Again, Turkey government has not published daily, monthly and weekly data based on province, district or even city based regularly during the studied period. A picture of government measures and approaches on real estate and urbanization are focused in order to find the dynamics of these sectors.

According to TURKSTAT 2019, 59% population of Turkey live in their own housing, 25.2% in rental houses, and the remaining 15.2% are staying in the government's quarter. Households are allocating 24.1% share to housing and rent expenditures which poses the highest share in total consumption expenditures, however in respect of Istanbul the households are allocating higher than other provinces with 28.6% share (TURKSTAT, 2019). These provinces are also among the ten largest provinces by population density. According to 2019 data, Istanbul province has the highest share in total Gross Domestic Product (GDP) with 30.7%. Ankara is followed by Istanbul with a 9.2% share. Izmir positioned third with a share of 6.1%. The provinces of Istanbul, Ankara, Izmir, Bursa and Kocaeli enjoyed the highest per capita GDP ($) and accounted for 53.7% of GDP according to TURKSTAT 2019 data (Table 1). On the other hand, three provinces such as Tunceli, Ardahan and Bayburt are posing with the lowest share in GDP.

These provinces are positioned among the ten lowest in terms of population density. When the provinces considered in the study are observed, it is seen that there is a linear relationship between the number of house sales and the per capita GDP ($) and its reflection naturally has an effect on the cities although Kocaeli province has the highest per capita GDP ($14,304) after Istanbul (TURKSTAT, 2021). However, it has followed Ankara, İzmir and Bursa in terms of housing sales, therefore, GDP per capita data is not the only data affecting the number of housing sales.

3. Results and discussion

3.1. Major economic outlook in Turkey

The normalization period started in Turkey at the beginning of June 2020. However, April and May in 2020 represented the significant reduction of 33.4% and 40.90% respectively as per Purchasing Managers Index 2020. Again, the significant increase in the

Table 1
Per capita GDP and Unemployment rate (%) in the 10 highest and lowest dense provinces in Turkey.

10 highest Densely populated province	Per capita GDP ($)	Unemployment rate (%)	10 lowest densly populated province	Per capita GDP ($)	Unemployment rate (%)
İstanbul	15.285	14.9	Bayburt	5.984	*
Ankara	12.508	14.20	Tunceli	8.423	*
İzmir	10.663	16	Ardahan	6.101	*
Bursa	10.382	11.02	Gümüşhane	5.122	*
Antalya	10.677	13.3	Artvin	8.952	*
Adana	6.484	11.9	Çankırı	6.619	*
Konya	7.201	8	Erzincan	8.327	*
Şanlıurfa	3.075	23.4	Kars	4.626	9.8
Gaziantep	6.627	15.2	Kastamonu	6.825	7.6
Kocaeli	14.304	13.5	Sivas	6.162	*

* Note: District wise data is not available.
Source: TURKSTAT, 2020a

month of July was 56.90% showing that the highest among the few years which signalled a return to the growth. The IMF World Economic Outlook forecasted a COVID-19 related contraction in the Turkish economy estimating around 0.9% in 2019 but it showed downside scenario to 5% in 2020 followed by growth of the same degree in 2021 and it forecasted an upward trend to 5% in 2021 (IMF, 2020) (Table 2). According to Turkish Statistical Institute, Turkey showed a decline of GDP growth rate from 2014 and in the second quarter of 2020 the GDP growth rate has reduced to 9.9% (TURKSTAT, 2020c). The IMF report forecasts unemployment in Turkey is set to reach 17.2% at the end of 2020, declining to 15.6% at the end of 2021. Having reached a 15-year high of 25.2% in October 2018, inflation entered a downward trend in the following months, closing 2018 at 20.3% and 2019 at 11.84%. The report also forecasts that the inflation rate will maintain current levels to close 2020 and 2021 at around 12%. However, the government's year-end inflation target is 8.5% for 2020. The current account deficits are projected to shrink from 8.0 billion US$ in 2019 to 2.9 billion US$ in 2020 (IMF, 2020).

In Turkey, the unemployment rate has increased from 2019 (Table 3) with youth unemployment rate 26.7%, almost doubling the average unemployment rate is 12.8% in April, 12.9% in May, 13.4% in June, 13.4% in July and 13.2% in August in 2020. In the country, where 2.2 million people are employed in the construction sector, employment has shrunk due to the decline in construction activities mainly and a similar situation applies to the tourism and commercial real estate market (Tanrıvermiş, 2020). The number of those employed in agriculture, construction and services have been decreased and the numbers of workers in the industrial sector have been increased at a limited level. Again, the national income per capita was 9042$ in 2019, together with the proportional decline in growth and increasing unemployment rates as of 2017, indicates that macroeconomic indicators are moving in a negative direction and COVID-19 added pressure for such direction.

3.2. Real estate market during COVID-19 in Turkey

The real estate sector in Turkey is performing well over the past few years and it became one of the most significant drivers of Turkish economy. Due to the increase in the number of COVID-19 cases in April and May, it has observed that the number of sales decreased significantly with the lockdowns issued by the government. It has been found that there is a 62% decrease in the number of sales of first-hand houses, a decrease of 55% in the second hand sales and a 58% decrease of total number of house sales compared to Q4 (October, November and December) of 2019 and March, April and May quarter period of COVID-19 in 2020. However, in June, the housing loan interest rate in three public banks such as Ziraat Bank, Halk Bank and Vakıf Bank have determined lowered the housing loan interest rates as 0.64 in first hand houses and 0.74 in the second hand houses in June in order to revitalize the sector again (Anadoly Anadolu Agency, 2020). Even, there was an urgent need for financial liquidity to increase buyers' potential to quickly purchase or sale the real estates. In addition, the deed transactions were carried out through online without going to deed registry offices. The Banking Regulation and Supervision Agency (BRSA) has increased loan value ratio from 80% to 90% (BRSA, 2020). It has seen from the graph, 624, 769 housing units sold in Q1 and Q2 of 2020 and housing sales increased to 23.5% or 118,973 units in the Q1 and Q2 year-on-year, (TURKSTAT, 2020d) (Fig. 2).

Construction and real estate sector is still the leading sector of Turkish economy; it has observed that there has been a serious decline in recent years. Therefore, a new decision has been taken in August 2020, when the cheap liquidity sources pumped into the market by the Central Bank and low-interest loans given by banks flowed into dollar and gold investments. While the Central Bank started to implement a monetary tightening policy in order to reduce the inflation rate, although the policy interest rate was kept constant at 8.25% (CBT, 2020), the liquidity resources of the banks were reduced after the monetary tightening decisions, which were reflected in an increase in loan rates, as a result the lowest housing loan interest rate jumped to 0.99%. Again, the construction companies needed liquidity due to sudden contraction in demand also caused serious price reduction pressure which increased the possibility of bargaining for buyers, while creating a chance for investors with high liquidity.

It has observed that a 45% decrease in the total number of mortgaged housing sales during the COVID-19 considering March, April and May in 2020 compared to the fourth quarter in 2019. During this time the number of mortgage sales was over 40,000. With the increasing number of COVID-19 cases in April and May along with governmental policy measures the results of the number of mortgaged housing sales performed only below 20,000 (Fig. 3). However, Q2 period of 2020 again reached very high sales figures due to the interest rates lowered by the public banks in June 2020. It also shows that the volume of housing loans withdrawn from financial

Table 2
Economic indicators of Turkey during 2019, 2020 and 2021.

| Economic Indicators	2019	2020	2021
GDP (Current US $)	$754 billion	$735 billion	-
GDP per Capita (Current US $)	$9042	$8790	–
Growth	0.9%	−5.0%	5.0%
Inflation	11.8%	12%	12%
Current Account Deficit (Billion US$)	$8.0	$2.9	–
Current Account balance	1.2	−3.7	−0.9
USD/TL (End of Year)	5.96	7.02	7.26
Unemployment Rate	13.7%	13.4%	12.7%*

*Data as of September 2020.
Source: TURKSTAT, 2020b; TURKSTAT, 2020c; IMF, 2020.

Table 3
Labor and unemployment in Turkey.

Years	Labor (1000 people)	Unemployed (1000 people)	Unemployment ratio (%)
2000	23,078	1497	6.49
2005	22,454	2388	10.64
2010	25,641	3046	11.88
2011	26,725	2615	9.78
2012	24,821	2518	10.14
2013	25,524	2747	10.76
2014	28,786	2853	9.91
2015	29,678	3057	10.30
2016	30,535	3330	10.91
2017	31,643	3454	10.92
2018	32,274	3537	10.96
2019	32,549	4469	13.73
2020 (Q1)	30,905	4187	13.54
April, 2020	29,388	3775	12.8
May 2020	29,684	3826	12.9
June 2020	30,632	4101	13.4
July 2020	31,491	4227	13.4
August 2020	31,749	4194	13.2

Source: TURKSTAT, 2020b.
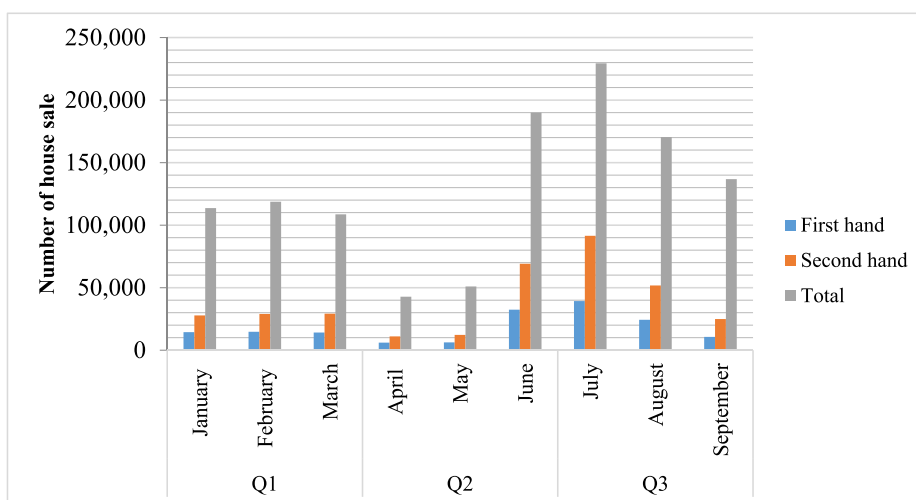
Fig. 2. House sales in the first three quarters of 2020
Source: TURKSTAT, 2020d.

institutions especially from banks has also increased. As a result the number of mortgaged housing sales jumped over 100,000 in June and July. Again after increasing interest rates in August according to the economic conjuncture, it has seen that there was a decrease in mortgage sales in August and September compared to June and July in 2020 (Fig. 3).

Again, it has observed that there was a strong connection between the number of building permits (permit certificates) and macro stability by years, and the number of licenses has almost halved in the last two years compared to the previous year. Accordingly, the construction permit decreased by 52.3% in 2018 and 78.2% in 2017–19 compared to the previous period, and it has observed that the new projects declined at the same rate (Table 4). Due to rising construction costs and insufficient sales prices, it has seen a significant change in real estate project development and marketing by adding the COVID-19 effect to the decrease in the number of new project development and building permits.

The enactment of the government policy with the possibility of providing Turkish citizenship to people who bought real estate with a value of $250,000 and higher in 2019 has allowed foreigners to increase their real estate investments. Turkey is the 14th among the world's most advantageous real estate markets for foreigners. The General Directorate of Land Registry and Cadastre of Ministry of Environment and Urban Planning prepared a web portal named "Your Key Turkey" in 6 different languages (English, German, Arabic, French, Russian, and Spanish) in order to enable foreigners to access updated data, legal and other related information, application processes and related tasks on real estate acquisition in Turkey. This guide opens doors of opportunities on real estate acquisition by the foreigners in Turkey (TKGM, 2020).

The real estate acquisition by the foreigners has reduced during COVID-19 by the cancellation of all foreign, domestic flights and
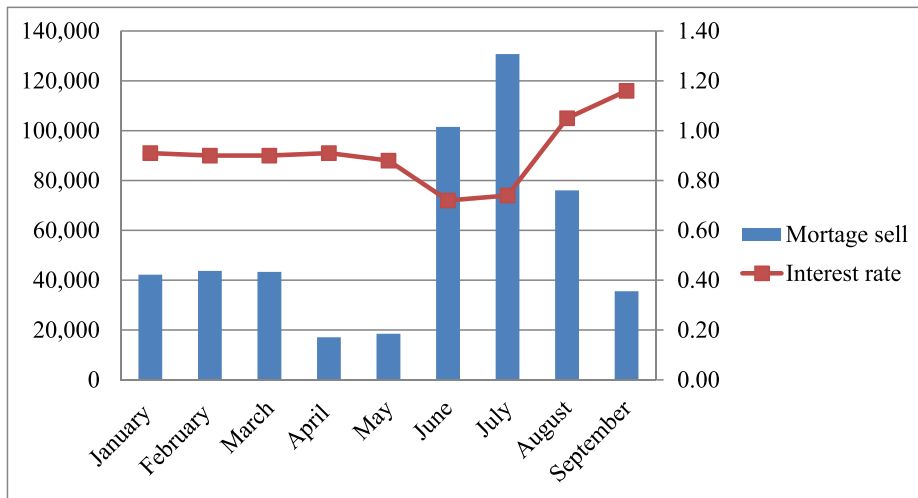
Fig. 3. Mortgage Interest rate and total mortgage sale in 2020
Source: CBT, 2020; TURKSTAT, 2020c.

Table 4
Number of building permits by years in Turkey.

| Years	Number of Buildings	Number of Independent units	Number of Houses
2010	139,616	907,451	902,634
2011	101,900	650,127	647,693
2012	107,816	771,878	767,426
2013	121,754	839,630	836,138
2014	139,541	1,031,754	1,027,303
2015	125,741	897,230	893,427
2016	134,099	1,006,650	1,002,725
2017	161,921	1,405,447	1,397,758
2018	104,143	663,200	659,986
2019	53,819	305,938	304,544
Q1, 2020	13,971	80,216	341,038
Q2, 2020	19,248	132,015	283,731
Q3, 2020	25,646	145,576	536,509

Source: TURKSTAT, 2020d.
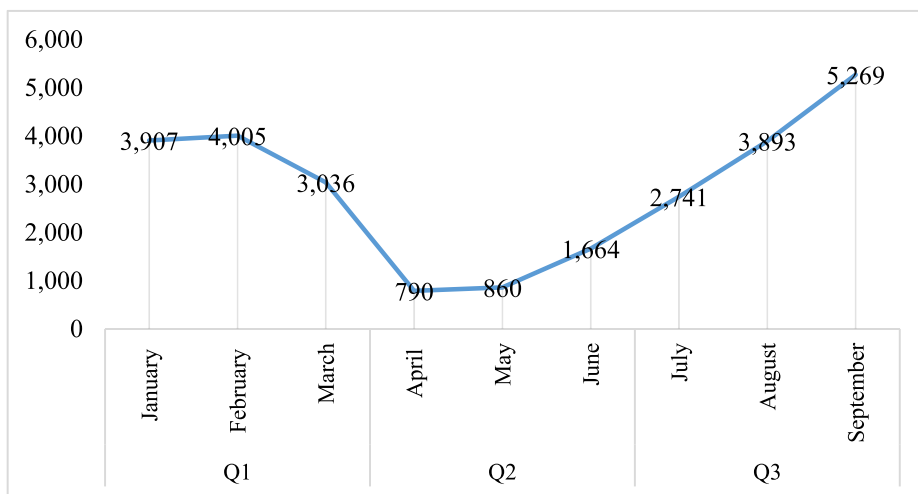
Fig. 4. Real estate acquisition by the foreigners.
Source: TURKSTAT, 2020d.

fairs with numbers of rules and regulations until normalization process. Compared to the Q4 of 2019 and Q1 and Q2 of 2020, it has seen that foreigners' real estate acquisition has decreased at a very high rate of approximately 90%. It has observed that the foreigners' real estate acquisition has increased proportionately and from August 2020 foreign sales back to normal situation, or even at an increased rate (Fig. 4). The main reasons behind the fluctuation of exchange rates bring other opportunities. As the real estate prices are based on Turkish Lira, and if the exchange rates increase, the prices on USD or Euro (for instance) has decreased by 8–10%. It has been found that foreigners mostly acquired real estate in Istanbul, Ankara and Antalya provinces followed by Bursa, İzmir, Mersin and Yalova. It has also found that most real estate buyers are mainly from Iran, Iraq, Russia and Afghanistan respectively in 2020 (Department of Land and Cadastre, 2020).

3.3. Urbanization outlook in Turkey

In Turkey, the first population census took place in 1927 during the republican period estimated total 13.648.270 population of which 75.8% lived in villages and suburbs, and 24.2% lived in the provincial and district centres of the cities. After the Second World War, in the 1950s, when industrialisation started to increase rapidly then people started to migrate to the cities and it increased rapidly after 1980 due to globalisation impact, large scale real estate and infrastructure developments and other socio-economic and environmental developments. Parallel to this, there has been observed a significant change in real estate development, real estate investments and financing, urban transformation, urban development, public administration and policies, increase in value caused by the taxation of wealth in the financing of public investments etc. (Tekeli, 2006, pp. 38–51).

After enactment of Law no. 6360 in March 2013 regarding the establishment of 16 metropolitan municipalities in 16 cities and 26 districts with amending certain laws the number of municipalities has increased from 16 to 30. Therefore, all the villages within the borders of the metropolitan cities were also transformed into (urban) neighbourhoods and with this legal amendment; the total population of the metropolitan cities were accepted as the urban population. The population of Turkey is estimated 83, 154, 997 according to data of December 31, 2019, of which 50.2% are men and 49.8% are women. The main demographic change in Turkey can mainly be observed in the rate of urbanization. For instance, in 1927, 75.8% of the population lived in rural areas and 24.2% in urban areas, while today this rate has sharp reversed. In 2019, it has been found that 92.3% of the population resides in provincial and district centres (urban areas) and only 7.7% in rural settlements (Fig. 5). The most important and dominant feature of the country's population is youth and young people. The share of the 0–14 age group in the total population was 23.1%, the share of the 15–65 age group was 67.8% and the share of the elderly population (age group of 66 years and older) was 9.1% and the average life expectancy has increased over time.

Defining city and urbanization only by laws in Turkish legal system shows many incomplete aspects of the definition of urbanization. Because the definition is made by laws based on population size but the phenomenon of urbanization has its social, economic, demographic and physical consequences. In parallel with rapid growth and development of cities and the continuous increase of the population, the growth of slum settlements has become a structural problem. Therefore, the government has established the Housing Development Administration of Turkey (TOKİ), aiming to solve housing and urbanization problems at national scale by providing adequate numbers of quality housing in a healthy urban environment. It also covers for the poor who migrate from rural areas to cities, to acquire housing at low wages. In this backdrop, TOKİ is aiming to build 100,000 social housing every year (Housing Development Administration of Turkey, 2020).
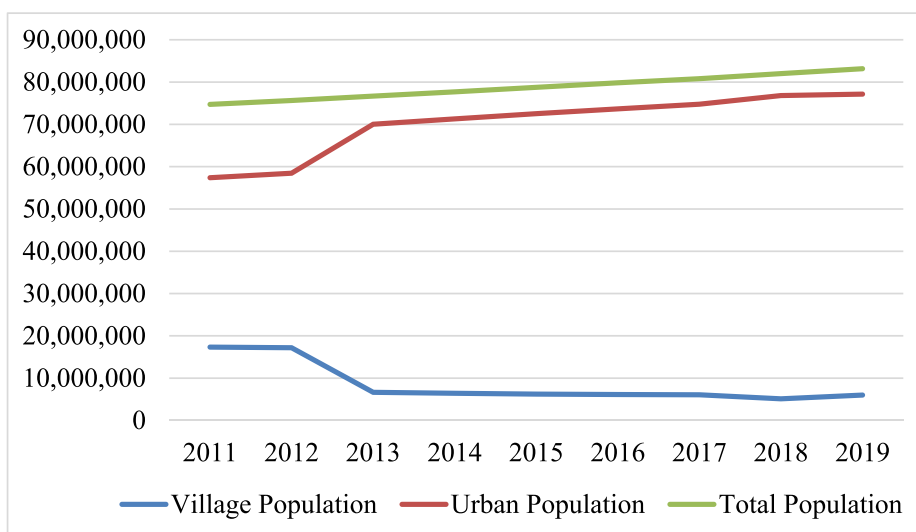

Fig. 5. Growth of urban and rural population in Turkey.
Source: TURKSTAT, 2020a.

3.4. Population densification and COVID-19 in Turkey

The pattern of spread of COVID-19 showed mainly in the urban areas of Turkey. As of November 20, 2020, Turkey has 435,273 confirmed cases, 367,592 recoveries, 12,084 deaths, and 16, 937, 887 tests performed (Ministry of Health, 2020). On October 30, 2020, the number of COVID-19 cases in Istanbul reached 40% of the total cases in Turkey (Ministry of Health, 2020). Again, availability of more space, avoiding dense areas, neighbourhoods or city centres, avoiding mobility, occupancy of private cars, an increase of house price and sales have been observed during COVID-19 in Turkey.

3.4.1. Housing sales in the highest densely populated provinces

The provinces in Turkey have undergone a fall and rise in housing sales during COVID-19 period. From March to October 2020 a recession has performed in the month of May and June throughout the provinces in Turkey. However, in July it focused a boom in the first decade of this century. The real estate markets in densely populated cities such as Istanbul (a global city) followed by Ankara, Izmir, Kocaeli and Bursa (who have sufficiency as a global city) and the least densely populated cities have found dynamic. Istanbul and Ankara are the leading provinces with the highest number of cases. In terms of population density in Ankara is the eighth largest province but the number of total housing sales performed after Istanbul. Izmir positioned third in terms of population density and the total number of housing sales. Zonguldak is positioned in the 10th densely populated province but the housing sales are very low compared to other densely populated provinces (Fig. 6). On April 10, Turkey began to enforce lockdowns on weekends in 30 metropolitan cities including Zonguldak because Zonguldak is a mining city where the highest number of asthma cases are available. Even, the housing sales have been reduced 19% from Q1 to Q2 in 2020. It can be stated here that the relatively better economic situation of these provinces compared to other provinces in Turkey shows that they have a positive impact on the number of housing sales and urbanization.

3.4.2. Housing sales in the least densely populated provinces

After examining the 10 least densely populated provinces in Turkey, it has found that the housing sales have been increased in all provinces except Tunceli. Even though Kastamonu has the least dense population (positioned 10th) but it enjoys second place in terms of house sales. It has been found that during the Q1, Q2 and Q3 of 2020 compared to the same three quarters of 2019, Tunceli has enjoyed the least housing sales in 2020 among the least dense provinces (Fig. 7). Ardahan is the second least population dense province and posing the lowest number of housing sales in Turkey but it has been enjoyed an increased number of housing sales during the period of Q1, Q2 and Q3 of 2020. It has seen that the ranking as per population-weighted index Kars, Kastamonu and Sivas are posing a significant number of housing sales due to government interventions.

As per real estate index in October 2020, it has seen that there is a 29.60% increased residential house price in all of the cities in Turkey and the average for sale residential property size is 130 square meters which represents bigger house size. In Turkey, for sale residential average square meter unit price in October 2020 is 2,560 TL (endeksa.com; 02.12.2020). A property having the same features for sale residential average ROI period is 18 years level. Considering annual averages, October 2020 residential prices in Turkey mostly increased in Kahramanmaraş, Muğla, Mardin, Bingöl, Antalya in descending order which represents that the prices were increased in average dense cities.

3.4.3. Housing sales situation in the districts of istanbul

Istanbul is Turkey's largest province, posing every aspect of Turkey's leading position including population density, housing sales and so on. Around 18% people live in Istanbul with a population of over 15.52 million inhabitants, making it the most populous Turkish city. Istanbul is dominated by the private sector and constitutes the majority of the service sector in Turkey. It has been found that the largest
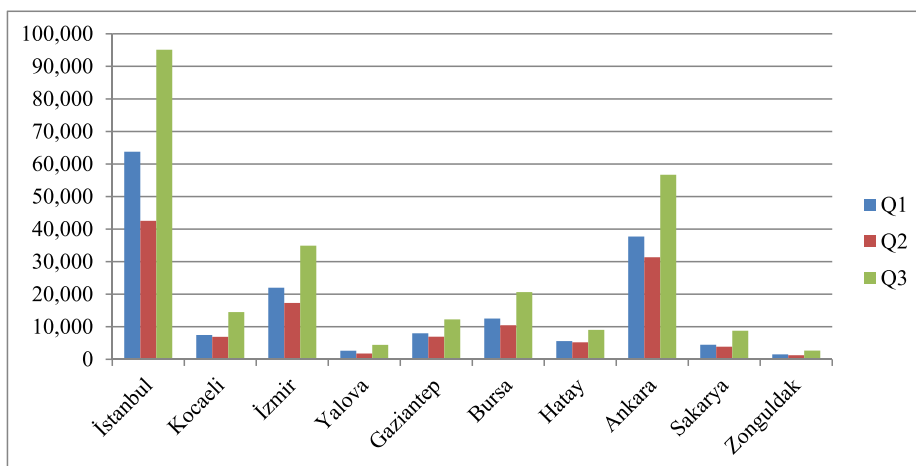

Fig. 6. Housing sales of highest densely populated provinces in the period of Q1, Q2 and Q3 of 2020
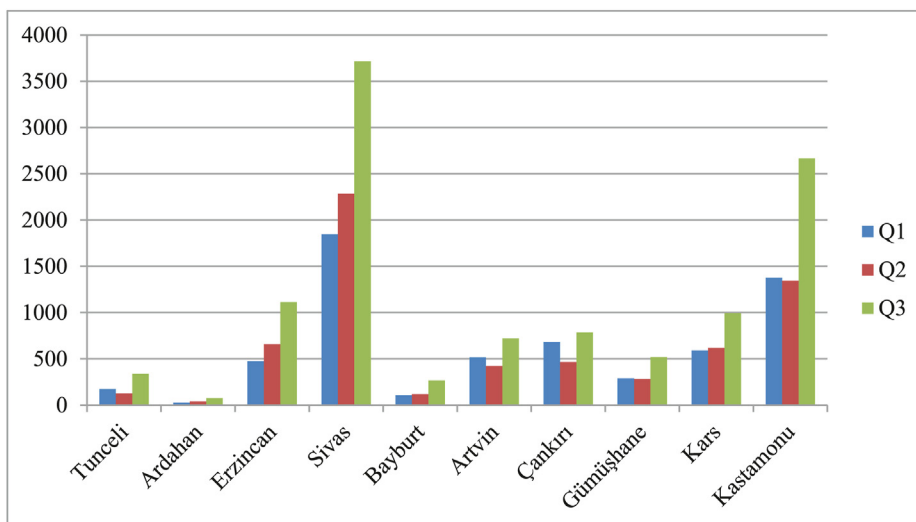Source: TURKSTAT, 2020d.

Fig. 7. Housing sales of least dense provinces in the period of Q1, Q2 and Q3 of 2020
Source: TURKSTAT, 2020d.

decrease in unemployment and employment rate together with the impact of a pandemic observed in Istanbul. This study has focused on the Population-Weighted Index and housing sale in 2019, 2020 and with a house price index in the districts of Istanbul (Table 5) (Onur, 2020).

As per July 9, 2020, Istanbul Metropolitan Municipality has mapped the most COVID-19 risky districts in Istanbul. Among them, urban dense areas more specifically in european side concentrated mainly on the service sector and business areas are found the higher risk than Asian side (Sozcu.com.tr, 2020; November 18, 2020). It also represented that COVID-19 risk was higher where metro lines were passed both European and Asian Side in Istanbul. The following figure shows COVID-19 cases prepared by Istanbul Metropolitan Municipality under "Istanbul Vulnerability Map" (Fig. 8).

The map represents that Başakşehir, Bağcılar, Sultangazi and Zeytinburnu are among the most COVID-19 risky districts in Istanbul. In these cities the Başakşehir and Zeytinburnu, the number of house sales have decreased by 646 and 62 respectively compared to 2019 data at the same period. It has been found that the number of housing sales has decreased compared to 2019 data in Başakşehir and Ataşehir districts located on the Anatolian side. Esenyurt is the most populous district not only in Istanbul but also in Turkey. This district is also known as a district of low income people (Söğüt, 2020). This district performed highest housing sales among the districts of Istanbul. A total of 22,143 houses were sold in the three quarters of 2019. IMF, 2020, (three quarters total) 27,035 houses were sold which represents the sale is greater than the number of house sales in many provinces of Turkey. Sarıyer on the other hand poses one of the lowest population densities in Istanbul and highest number of green areas in European side. The majority of the construction type in Sarıyer consists of luxury villas and detached houses where mostly people with high income live. In 2019, 2109 houses were sold in the total of three quarters (Q1, Q2 and Q3) and in the Q1, Q2 and Q3 of 2020, a total of 2334 houses were sold. Although the population density in Güngören is very high but the number of house sales enjoyed is very low. In the light of these data and government statements the numbers of COVID-19 cases are among less than other districts of Istanbul.

4. Recommendations and conclusions

After the Second World War, the pace of urbanization, industrialisation has increased rapidly and thereby the urban problems have increased gradually. In recent years, Turkey is posing a weaker economy and COVID-19 outbreak is adding pressure on the economy as well as affecting human life adversely. Cash and savings became more important due to the pandemic, and the continuing and future uncertainty regarding the end of pandemic, these all reduced the demand for real estate despite adequate supply of real estate in the provinces and districts.

Cities with lower population density in Turkey have had less infection than highly dense cities. With the emergence of virus, the major driving factors such as high population and density in the city centers, curfew, economic problems and unemployment lead to migration from the city to the countryside. However, the main reason in the densely populated big cities is to lose enough potentiality for employment due to COVID-19. The Q2 of 2020 has really posed a significant negative impact in the real estate market due to COVID-19. The governmental packages and necessary action tried to minimise such challenges. As a result, the housing sale did not reduce during the pandemic period of Q3 in 2020. It is clear that people's housing demand and choice from dense city areas or city centres to less dense areas are also evident in some Turkish provinces and districts. Due to cheaper life in rural areas, villa or independent housing, absence of high-rise multi-family buildings and houses, less population density and consequently the low number of COVID-19 cases all makes less central area districts more attractive and choice. In addition, the urban fringes, rural areas and newly developed residential areas, horizontal construction all are accelerating in real estate market and the relationship between price and rent money are changing in real

Table 5
Ranking of districts in istanbul by population weighted density.

		Population weighted Index	Population 2019	Ranking by population	Ranking by density	House sale 2019 (Q1+Q2+Q3)	House sale 2020 (Q1+Q2+Q3)	House price index
1	Esenler	63446.59	450,344	14	11	1744	2099	3.249
2	Zeytinburnu	58428.67	293,574	24	10	2491	2429	4.537
3	Bahçelievler	56462.53	611,059	6	3	3967	6152	3.447
4	Güngören	52238.11	289,441	25	1	1352	1998	3.307
5	Bağcılar	45610.71	745,125	3	4	3591	4069	3.275
6	Gaziosmanpaşa	45463.80	491,962	10	2	3089	4748	3.200
7	Fatih	42360.19	443,090	17	7	2324	2941	4.291
8	Esenyurt	41066.24	954,579	1	12	22,143	27,035	2.483
9	Kağıthane	40649.17	448,025	16	6	3948	5086	4.255
10	Şişli	39847.57	279,817	27	8	2737	2819	5.640
11	Sultangazi	37501.50	534,565	7	18	3846	5279	2.757
12	Beyoğlu	36994.65	233,323	33	9	1363	1826	5.640
13	Bayrampaşa	33470.04	274,735	28	5	1476	2269	3.380
14	Küçükçekmece	32392.30	792,821	2	14	3819	5362	3.962
15	Maltepe	24677.43	513,316	9		4275	6339	4.320
16	Ümraniye	23978.15	710,280	5	16	5106	9115	3.854
17	Eyüpsultan	23528.64	400,513	20	31	3156	4497	4.334
18	Üsküdar	22591.29	531,825	8	17	2665	3876	5.062
19	Avcılar	22276.96	448,882	15	24	3807	5029	3.068
20	Çekmeköy	21785.33	264,508	30	32	3891	6453	3.223
21	Kadıköy	20287.20	482,713	11	13	6637	8018	8.450
22	Ataşehir	20226.28	425,094	19	15	6731	5612	4.976
23	Sancaktepe	18031.19	436,733	18	26	6556	9791	2.718
24	Kartal	17943.20	470,676	12	19	5519	7733	3.850
25	Pendik	17573.22	711,894	4	28	7645	10,663	3.172
26	Beşiktaş	16480.12	182,649	36	12	1380	1621	11.856
27	Sultanbeyli	16175.04	336,021	23	20	1928	2891	2.866
28	Bakırköy	14619.51	229,239	34	25	2321	2866	9.658
29	Beylikdüzü	14517.71	352,412	21	23	7871	10,513	2.872
30	Tuzla	8234.88	267,400	29	30	4502	5586	3.396
31	Arnavutköy	7994.99	282,488	26	36	2296	3752	2.533
32	Başakşehir	6752.33	460,259	13	27	7402	6854	4.800
33	Sarıyer	6667.63	347,214	22	29	2109	2334	11.516
34	Beykoz	6270.48	248,260	32	35	229	355	8.782
35	Büyükçekmece	6182.57	254,103	31	33	3844	5,32	3.659
36	Silivri	4917.78	193,680	35	37	3050	4198	2.697
37	Adalar	1572.54	15,238	39	34	n.a	n.a	7.486
38	Şile	744.20	37,692	38	39	n.a	n.a	4.156
39	Çatalca	408.19	73,718	37	38	n.a	n.a	2.993

Source: Onur, 2020 and TURKSTAT, 2020a.

estate markets with the decrease of dense cities in order to overcome the risks of pandemics in Turkey.

The electronic real estate business, adoption of new and innovative technologies, proliferation of transactions with bank accounts, crypto or electronic money, rather than cash, becomes tools in the present business model. While it is possible for people in different countries to be able to trade and trade without face-to-face creates an obligation to prevent counterfeiting or to ensure security with all kinds of developed internet and web-based systems. The necessity of transformation in Turkish real estate by using online technology as a way out of the process is inevitable. However, it should reflect low income people who have less accessibility of information. Even, the existing boost of flexible-office and co-working trends has reduced the poor people's working arena. The higher income people who want to buy a real estate can avail adequate digital facilities to acquire knowledge and information as well as perform market research to buy real estate. The government policy interventions are of course playing a pivotal role in Turkish real estate market including various strategic measures in the socio-economic sector including house rent and others. COVID-19 is such an example to enhance the economy both locally and internationally. It has been found that there was a significant reduction in the housing loan interest rates led to an increase in housing demand and an artificial increase in housing sales price in the short period. However, the spread of debt to maturity and the appropriate amount of payment have led to the ceiling of the sale of residential real estate, mostly in these pandemic days.

Considering the world economy in general with current COVID-19 situation, the developing and emerging country like Turkey are affected a lot, therefore, the unpredictable nature of existing and potential economic losses, the pertaining knowledge of infrastructure, real estate financing, planning, and management needs to be re-evaluated in order to make the cities withstand against the existing and future shocks by maintaining the standard level services. However, policy makers need to take necessary action with a strategic focus on business continuity approach at the on-going COVID-19 future risk, population density, impact and so on. This study also recommends that already COVID-19 is adding pressure on diminishing marginalised and disadvantaged family's capacity and the government has taken a number of initiatives through TOKİ but there is a need for stronger focus and attention during this pandemic period on affordable housing for the poor and disadvantaged families as well as fair sharing of the income generated by productivity.
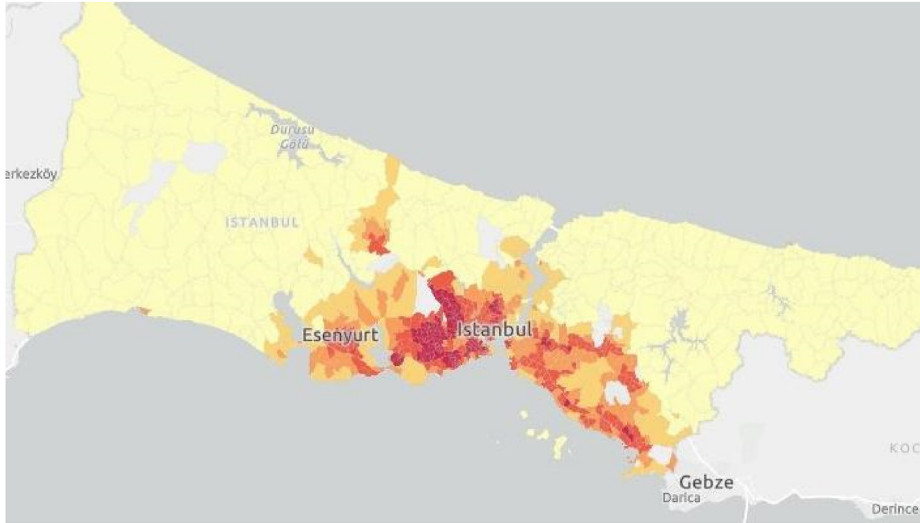
Fig. 8. Istanbul vulnerability map due to COVID-19
Source: sozcu.com.tr, 2020; (November 18, 2020).

Declaration of competing interest

None.

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