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Land Value Based Wealth Inequality in Turkey

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ABSTRACT

Wealth inequality has been increasing globally. One of the biggest components of wealth is real estate. Real estate can be decomposed into two (1) land (2) dwellings (ie. commercial/industrial or housing). In this paper we focus on land values in Turkey. We have extracted data from the biggest commercial website in February-March 2021. There are around 170 thousand observations in the original sample dataset. The dataset provides information on city, town, size and price. We have three types of findings based on the analysis of the sample data. First, we show that the wealth inequality based on land values is dramatic in Turkey as of 2021. The top 1 percent possesses almost 15% of all land wealth. Top 10 percent controls 59% of all land value. Gini coefficient in land values is around 0.69. Second, we map city based inequalities in terms gini coefficients across cities and underline the significant variation in land based wealth inequalities. Third, we calculate average premiums on some of the attributes of land, such as being in zoned location, being close to shore or being in an organized industrial district.

KEYWORDS

Land Ownership, Inequality, Distribution

1. Introduction

Wealth inequality has been increasing globally (Gradin et. al. (2021) Gradín, Leibbrandt, and Tarp (2021)). One of the biggest component of wealth is real estate. Real estate can be owned by public or private agents. Government and municipalities own various types of real estate. Schools, ministries, parks and dams are some of the real estate owned by the public agents. We are interested in real estate owned by the private sector. Real estate owned by the private sector can be decomposed into two main segments: (1) land (2) dwellings (ie. commercial/industrial or housing). In this paper we will focus on land values in Turkey.

Davies et. al. (2011) and Piketty (2014) are important studies analyzing the evolution of wealth dynamics across countries. Latter finds an U-type pattern during the 20th century for wealth-income ratios across major developed countries. There are a few studies focused on the wealth distribution in developing countries.

Agricultural land constituted the most important wealth component in the early twentieth century, while urban land value became the most important component in the early twenty-first century. Frankema (2010) reports that rural land size gini coefficient in Turkey was 0.608 in 1960.

We find that the wealth inequality based on land values is dramatic in Turkey as of 2021. The top 1 percent possesses almost 15% of all land wealth based on available data extracted from a comprehensive private dataset. Top 10 percent controls 59% of all land value. Gini coefficient in land values is around 0.7. There exists a positive relation between the mean price of the land and inequality across cities.

We should note that our findings are underestimation of land wealth inequality. We have sample selection bias. Not everyone has land to sell in this commercial website. Most of the households do not own land. Some of the top sellers may have more land to sell in stock, yet have not put them on sale. Furthermore, some of the top sellers may own multiple items in our dataset, yet we have no way to extract the combined values of their land holdings given the data limitations of our sample.

2. Related Literature

There exist very few studies on the measurement and analysis of wealth inequality in Turkey. Davies et. al (2009) Davies et al. (2009) is a study that depicts the extent of wealth inequality across countries based on Credit Suisse Wealth Reports. The wealth gini calculated in that study is 0.71 for Turkey. However, this finding is limited to only financial assets.

Torul and Öztunalı (2018) Torul and Öztunalı (2018) estimates a wealth Gini of 0.78 based on a calibration in a general equilibrium model. The model's finding depends critically on the assumptions made with regards to key parameters for which official data rarely exist.

Our approach is more general and bottom-up.

3. Method and Data

3.1. Webscraping

The raw data is extracted from a commercial website (sahibinden.com) in March 2021. There are 188 thousand observations in the original sample data. The data provides information on city, town, size and price. The raw original data has quite a bit of outliers. One particular outlier observation involves a land size with 15 million square meters. We eliminate the remaining outliers by removing the bottom and top 1% from the original sample data, in terms of price, size or price per square meter. At the end, we have 162 thousand unique observations which form up our dataset for the analysis.

3.2. Data

Table 1 is the descriptive statistics for Turkey. The price variation is dramatic. The minimum price of land is 20 thousand TL. Median price is 360 thousand TL. The mean price is little over 1 million TL. Standard deviation of the price is more than twice of the mean price, 2.66 million TL.

The similarity in terms of variation in size is as expected. The minimum size is 101 square meters. The median size is 1783 square meters. The largest land to be sold is 134600 square meters. The standard deviation of size is 12777 square meters, which is more than twice of the mean, 6177 square meters.

The mean price per square meter is 1898 TL. We should note that these lands cover

both the urban and rural landscapes in Turkey. In rural areas, the size gets bigger and the price per square meter gets smaller.

The top three land sales in terms of price which exceeds 23 million TL are in “Beylikdüzü”, “Sarıyer” and “Yenimahalle”. The first two are in İstanbul, whereas the last one is in Ankara.

Table 1. Descriptive Statistics, Turkey

Statistic	Mean	St. Dev.	Min	Median	Max
price	1,096,704.0	2,266,945.0	20,160	360,000	23,750,000
size	6,177.6	12,177.6	101	1,783	134,600
Pmsq	700.3	1,898.0	0.3	230.9	67,164.2

Overall the total land values in our sample amount to 200 billion TL. In order to gauge the total wealth in terms of land in Turkey we should make some adjustments. First, our sample is a cross sectional cut from March, 2021. Therefore it is a flow not a stock. Assuming that it constitutes about 14% of all sales in a given year (162000/12000000) the total potential value of the wealth based on land in a given year would be 1.4 trillion TL.

Some of those land sales transactions could be duplicates. Assuming a conservative figure, if we take that half of the total value that is 0.7 trillion TL denoting the genuine land value we may reach a final stock value. In a given year, if we take total house sales in a year to total housing stock is equivalent in land sales, total land value would be around 28 trillion TL. (30 million housing stock / 1.5 million annual house sales)*total annual land value.

In order to reveal the land based stock value we compare it with the GDP in 2021, that is 7 trillion TL. Land based stock value is 4 times the GDP. Next, we report the adjusted figures of fixed assets and inventories reported by the Ministry of Industry for more than 3 million enterprises. The total value of fixed assets and inventories in 2021 would be 6 trillion TL. Thus, land based stock value is 4.6 times of that amount.

Table 2. Summary Statistics for Selected Cities

city	cityMeanP	cityMeanS	cityPmsq	N
istanbul	10010109.4	7441.365	5359.6353	3819
rize	2702819.7	6492.908	1362.4801	217
gumushane	889092.5	23596.883	1284.8013	60
ardahan	491606.6	112103.699	1078.7973	73
izmir	2719356.9	15469.884	975.2958	6112
yalova	1812033.4	4114.119	930.8468	1650
mugla	2011005.6	11161.370	908.0400	3115
antalya	2429786.3	14055.737	855.4837	6882
sanliurfa	1872708.3	32722.013	834.1184	696
kocaeli	1779136.1	7078.282	833.9609	4514

In Table 2 we note that price per meter square in İstanbul is the highest at 5.5 thousand TL. Urfa has the largest saleable land size at the average of 32 thousand meter squares.

3.3. Method

We will mainly use three measures to analyze overall wealth inequality based on land values. First is the Gini coefficient. Second is the share of top 1 and 10 percent. Third measure is Theil index.

Suppose that there is an n units of land values (or land sizes) and that unit i has a price (size) of x_i . The price (size) distribution is then simply the vector $X = (x_1, x_2, \dots, x_n)$. Let $\mu(X) = \frac{1}{n} \sum x_i$ be the mean of the price (size) vector. Then Gini coefficient will be

$$I_{gini}(X) = \frac{1}{2n^2\mu(X)} \sum \sum |x_i - x_j| \quad (1)$$

Top 10 percent share is simply the sum of the largest 10% of the ordered vector X in total.

Theil index is based on the generalised entropy class measures.

$$I_{Theil}(X) = \frac{1}{n} \sum \left[\frac{x_i}{\mu(X)} \right] \log \left(\frac{x_i}{\mu(X)} \right) \quad (2)$$

4. Results and Discussion

4.1. Overall Wealth Inequality

In Table 3 and Table 4 we illustrate the extent of the wealth inequality in terms of land value and land size.

Table 3. Wealth Inequality in Land Values

Gini	0.689
10 Percent	0.59
Theil	0.955

Table 4. Wealth Inequality in Land Size

Gini	0.707
10 Percent	0.556
Theil	1.133

We also examine the inequality in urban and rural settings. We find that wealth inequality in terms of land values is slightly less in rural settings compared to urban areas.

4.2. Premiums on Particular Features of Land

Main determinant of the land value is location. However, there are other important institutional and policy based factors influencing the land value.

In Table 5 we report the premiums and penalties on some of the features of land controlling size and location (i.e town).

Table 5. Premiums in %	
Zoned Land	43.17
Sea view	55
Industrial	111
Agr. Field	-71

4.3. Land Based Wealth Inequality Across Cities

We carry out the same analysis across cities in Turkey. We report the results in Table 6 below, with Gross Domestic per Capita levels for selected cities. These cities have the highest land based wealth inequality in terms of land values.

Table 6. Unequal Cities

	city	Price Gini	Size Gibi	Mean Price	Mean Size	Price per sqm	N
1	balikesir	0.858	0.903	1,312,727.000	28,917.950	403.928	3,333
2	tekirdag	0.843	0.883	2,376,028.000	13,756.060	566.722	2,212
3	kirikkale	0.833	0.914	1,236,803.000	17,575.080	421.565	367
4	istanbul	0.832	0.929	10,010,109.000	7,441.365	5,359.635	3,819
5	bursa	0.820	0.916	1,764,816.000	19,778.010	833.245	3,241
6	izmir	0.797	0.857	2,719,357.000	15,469.880	975.296	6,112
7	antalya	0.790	0.875	2,429,786.000	14,055.740	855.484	6,882
8	konya	0.789	0.909	763,585.300	61,178.580	218.958	1,366
9	kutahya	0.787	0.820	619,167.500	10,359.310	375.719	843
10	eskisehir	0.784	0.910	1,110,588.000	45,687.060	435.434	1,517

4.4. Mapping

We map the city level gini measures on a plot with different scales denoting the extent of wealth inequality.



Western regions are more unequal compared to central and eastern regions.

In order to see what may derive the wealth inequality based on land values across

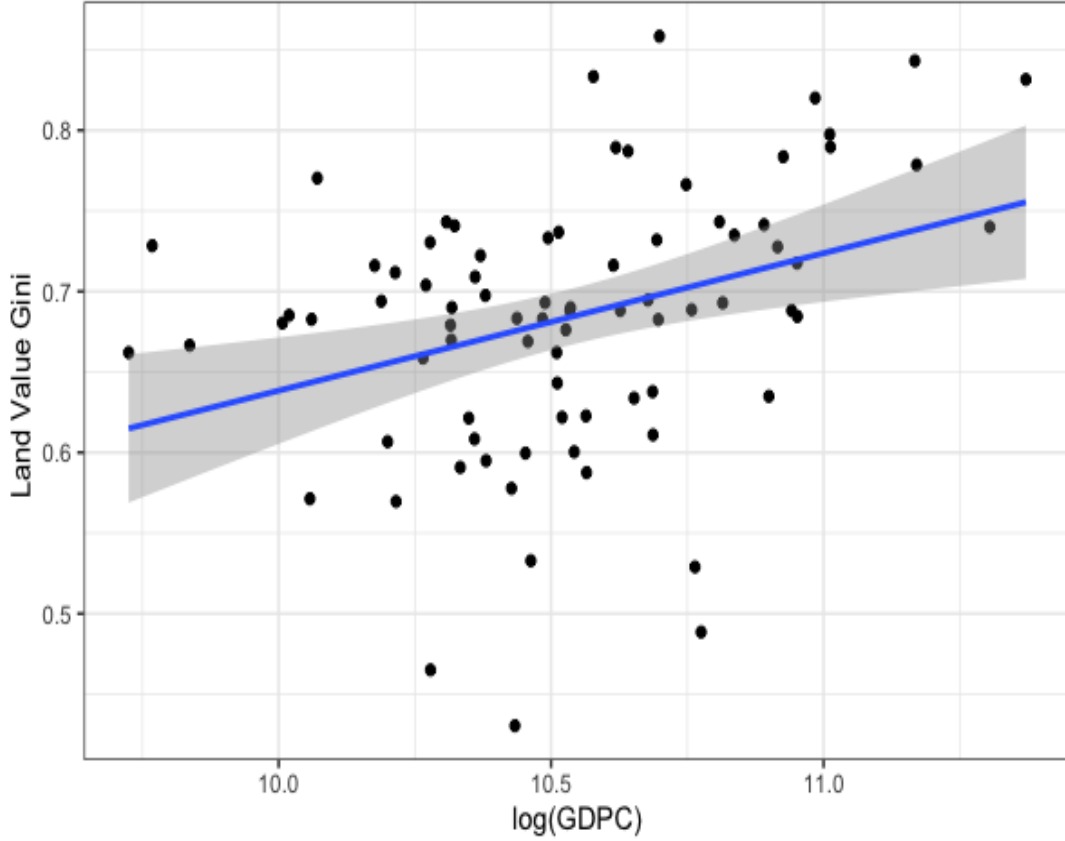


Figure 1. Income and Land Based Wealth Inequality

cities we plot a simple graph. As the average income increases, so the wealth inequality based on land values across cities.

Next we run a simple regression.

In Table 7 we find that city level average prices and incomes are statistically significant as explanatory variables of the wealth inequality across cities. About 40 percent of the variation in wealth inequality across cities can be explained by the variables considered in the regression.

5. Conclusion

Developing countries in general, Turkey in particular, suffer from lack of data on wealth distribution. Turkey has no official survey on wealth. Tax audits are not public. Given the lack of data we attempt to bridge the knowledge gap between the studies on developed countries by focusing one of the largest component of wealth in developing countries.

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Table 7. OLS Regression

	<i>Dependent variable:</i>
	cityGiniP
log(GDPC)	0.048** (0.022)
log(cityMeanP)	0.083*** (0.012)
log(cityMeanS)	0.015 (0.010)
Constant	−1.108*** (0.289)
Observations	81
R ²	0.440
Adjusted R ²	0.419
Residual Std. Error	0.063 (df = 77)
F Statistic	20.207*** (df = 3; 77)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01

Gini coefficient in land values is around 0.69. Second, we map city based inequalities in terms gini coefficients across cities and underline the significant variation in land based wealth inequalities. Third, we calculate average premiums on some of the attributes of land, such as being in zoned location, being close to shore or being in an organized industrial district.

Lastly we find that as the income and price of land across cities go up, the wealth inequality also goes up. Inequality breeds inequality.

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