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Calculating the Housing Wealth Effect of Israeli regional cohorts

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Abstract

Uses pseudo-panel construction to calculate the housing wealth effect for regional cohorts of Isreali households. Combines data from the Central Bureau of Statistics Household Expenditure Survey and the Consumer Price Index.

Keywords: consumption, economics, housing, housing market, liquidity constraints, wealth effect

1 Introduction

1.1 The housing market

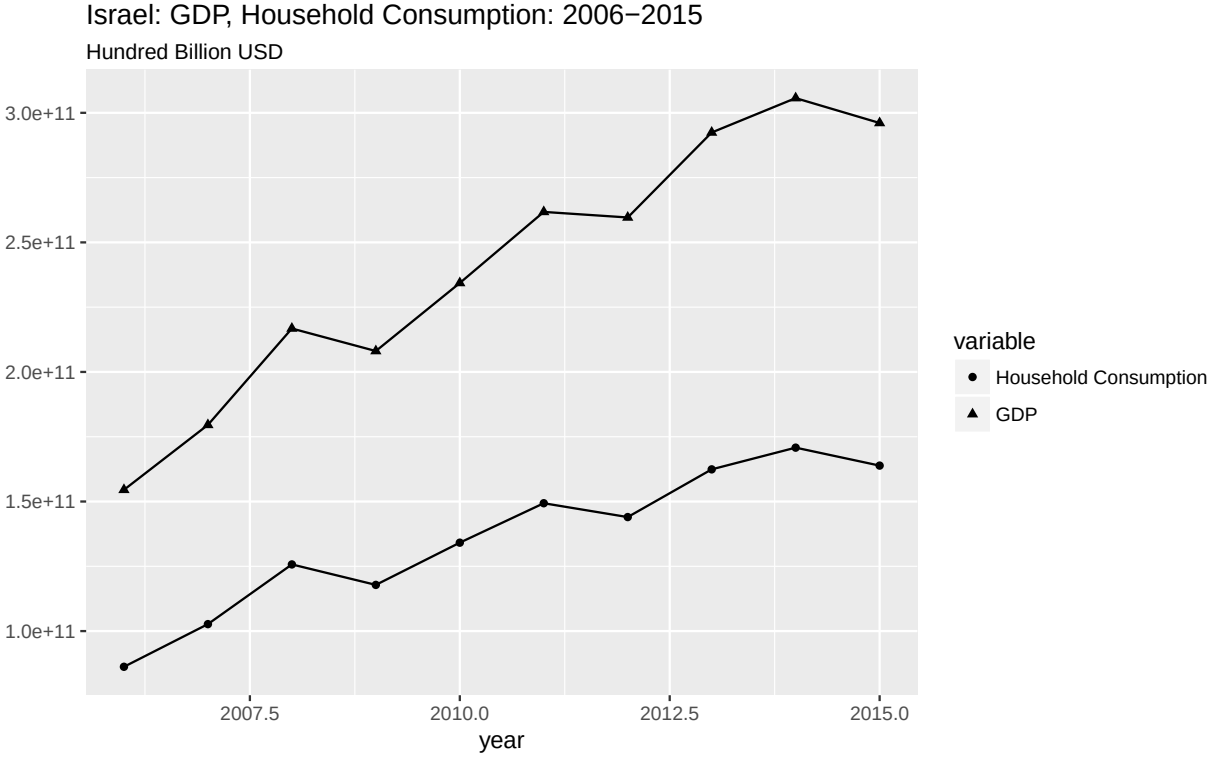
The study of housing provides a fascinating topic for the researcher of Israeli society. Several factors have drawn attention to the housing market and made it a topic of much discussion. The price of housing was one of the main issues that drove more than 400,000 demonstrators to the streets in the summer of 2011. Large portions of the Israeli population own a home, or rent one, or live in a multi-family household. Their first-hand experience of the market may be relayed to the researcher as anecdotal evidence of the state of the housing market, as well as causes and solutions for the perceived short-comings of the market.

In a simple economic model of a housing market, home prices are set by the market forces of supply and demand. Various factors influence the supply and demand of housing in the market. Consider an interest-rate reduction, this shifts the demand curve to the right, as cheaper credit entices more buyers to enter the market. It also reduces credit-constraints on builders and leads to increased supply, albeit after some lag. In Israel, the average home price has risen by an astonishing 80% between the 2008 global financial crisis and 2016. In the minds of many lay observers this rapid increate indicates a lack of supply. Main bottlenecks limiting supply are cited as the sale of government land or the lengthy permitting process for new construction.

Gruber (Gruber 2016), however, offers copious evidence and cogent reasoning to support his claim that the chief factor in the rise was actually excessive demand. As global capital markets suffered large declines, investors moved to other asset classes, including the real estate market. The additional factor of low interest rates lead to a dramatic increase in purchase of additional houses by those who were already owner-occupiers. This shifted the demand curve to the right, increasing the average cost of an apartment and driving out less affluent first-time homebuyers. These would-be first-time homebuyers then entered or remained in the rental market, driving up average rents. The higher market rental prices and lowered vacancy rate established a feedback loop which further encouraged in the purchase of investment houses as rental property.

1.2 Consumption by Households

The expenditure method for calculating National Income (Y), states that Y=GDP=C+I+G+NX. The gross domestic product is equal to Consumption Expenditure (C) plus Investment Expenditure (I) plus Government Expenditure (G) plus Net Exports (NX). Firms and households each engage in both consumption and investment. When a firm buys a copy machine which lasts several years, that is an investment. The purchase of owner-occupied housing is the largest investment made by most households. The paper placed in the copy machine and the food on the table are each classified as consumption. Consumption by households makes up a large and important part of GDP, as seen in figure 1.



As can be seen from the graph, in 2015 Household Consumption was 55.3% of GDP. If the housing wealth effect is large is, its effect on this large portion of the economy will have real, import, reaching effects in people's lives. It is a measure tracked closely by businesses, economists and the government.

Household income is either saved or consumed, with the marginal propensity to consume (MPC) and the marginal propensity to save (MPS) summing to 1. Generally, household consumption can be understood as household income times the MPC. The MPC can be affected by the interest rate, rising interest rates incentivize additional savings, raising

the MPS and lowering the MPC. Falling interest rates decrease the attraction of savings. With a constant MPC a household can increase consumption due to increased income from a salary increase, hourly wage increase or increase in the number of hours worked. Household consumption would fall due a decrease in salary, wages or working hours. A further factor in consumption is expected future income. This posits that the rational consumer increases their consumption now if they know that they will get a raise or some overtime next week. They will also reduce consumption and increase savings now when they expect future unemployment or wage reductions. Another factor affecting consumption is the wealth effect. When the wealth of a household increases (the price of shares held in an investment portfolio, the price of a Picasso on the wall or in a vault, the price of the family home or rental property), household consumption increases, in effect spending now some of the expected future gains on the sale of the shares, painting or real estate. Conversely, a decline in household wealth should produce a decline in household consumption.

2 Literature Review

2.1 the housing wealth effect

Many households around the world store a majority of their wealth in housing. This, combined with the volatility of swings in house prices, has caused academics and policy makers to further investigate the housing wealth effect and its implications for GDP.(Gan 2010) Renters and owners should be effected differently by a change in housing prices. An increase in housing prices should increase consumption by owners and decrease consumption by renters. Changes in house prices affect renters through the mechanism of the savings motive. One of the factors influencing the renter's mix of savings and consumption is their desire to purchase a home in the future. Renters respond to an increase in the price of housing by adjusting their expectation of the future price of the home they wish to purchase. They then reduce their consumption and increase their savings rate. Research using Japanese data showed that renters fell into two categories when faced with increased housing prices. Some gave up saving for a home and instead increased consumption of luxury goods in what was termed the "consumption of despair." The other group decreased consumption, and increased their savings rate, still dreaming of

home ownership. These effects on renters were subsequently found in data from Canada and San Francisco.(Sheiner_1995)

The data used in the proposed study should allow me to measure the extent to which Israeli renters engaged in consumption of despair over the last fourteen years. The life cycle savings hypothesis suggests that consumption of anticipated increases in wealth will be distributed by consumers over time, and that there would be a single MPC for both housing wealth and stock market wealth. When empirically tested, data showed that 85% of respondents did not increase consumption in response to a change in their shares portfolio. Several reasons were suggested why changes in the value of wealth held in different forms would illicit different consumption effects from households. Prices changes in some assets may be viewed as transitory. Others may be harder to measure than the daily feedback of the stock quote. Tax laws may discourage the sale of certain assets and wealth may be held in separate "mental accounts," one of which may be a rainy-day fund against life's uncertainties.

2.2 Mechir Lamistaken - The Israeli first-time homebuyers program

Finance Minister Moshe Kahlon has a plan to deal with the excess demand in the housing market caused by real estate speculators who would own one apartment and still buy one or more others as rental property. The Mechir Lamistaken program sells land to developers at a below market rate if the housing is reserved for first-time buyers. However, there is evidence for widespread use by investors of strawbuyers to evade the restriction. Thus, young families are still squeezed out of the market and the government forgoes revenue from land sales while benefiting investors. An important factor that reduces the supply of housing by increasing permitting times for new construction is the lack of municipally determined property tax rates. New residential units add an additional burden on city infrastructure and do not pay for themselves in terms of the taxes they generate. Wealthier districts make up the short fall through taxes on commercial property. Poorer localities throw up additional barriers to delay the construction of apartments until they are promised balance grants by the Ministry of Interior.

3 Methodology

3.1 Reproducible Research

As a simple example of reproducibility, I include here the code that produces figure 1, the line graphs of GDP and Household Consumption from World Bank Data.

```
importGDP<-read_csv("gdp_consumption.csv")
consumption<-importGDP[-c(1,2,3,6,7), -c(2,3,4)]
ConsGDP<-melt(consumption,id="year")
figure1<-ggplot(data=ConsGDP,
          aes(x=year,
              y=value,
              ylab="2010 Costant USD (hundred billion)",     shape=variable,
              scale_y_continuous(limits =c(0,320000000000)),
             # legend=NULL,
              group=variable))
          +geom_point()+geom_line()
          +ggtitle("Israel: GDP,
           Household Consumption: 2006-2015")
          +labs(subtitle="Hundred Billion USD")
percent(fixConsGDP[10,3] / fixConsGDP[20,3])
```

Let's look at these five commands in detail. The first line imports the data which was downloaded as a comma separated values file into a matrix called importGDP. The second line strips off explanatory rows and colums that were included in the file, leaving only the numbers needed for the analysis. Brackets after an object's name access its [Rows,Colums]. The R syntax c() creates a list. Here we have a list of rows 1, 2, 3, 6 and 7, and a list of columns. The -c indicates that these rows and colums are being removed. The remaining rows and colums are saved as a new matrix called consumption.

year	Household Consumption	GDP
2006	86221105076.5295	154511423313.434
2007	102682261872.885	179564275455.807
2008	125721014492.754	216760312151.616
2009	117825954276.123	208068814688.605
2010	134117945974.86	234321743781.76
2011	149337078337.665	261764344205.025
2012	143996472937.576	259613579190.332
2013	162407776669.99	292408330563.864
2014	170790407781.101	305674837195.003
2015	163855613872.594	296075434804.981
2016	NA	NA

The object consumption contains two observations per row, the values for household consumption and GDP for each year. The next line melt(consumption,id="year") remakes this matrix into what is know as the tidy data format of one observation per row and saves it with the new name ConsGDP. Having our data in the tidy format will make writing analysis and graphing code much simpler.

	year	variable	value
1	2006	Household Consumption	86221105076.5295
2	2007	Household Consumption	102682261872.885
3	2008	Household Consumption	125721014492.754
4	2009	Household Consumption	117825954276.123
5	2010	Household Consumption	134117945974.86
6	2011	Household Consumption	149337078337.665
7	2012	Household Consumption	143996472937.576
8	2013	Household Consumption	162407776669.99
9	2014	Household Consumption	170790407781.101
10	2015	Household Consumption	163855613872.594
12	2006	GDP	154511423313.434
13	2007	GDP	179564275455.807
14	2008	GDP	216760312151.616
15	2009	GDP	208068814688.605
16	2010	GDP	234321743781.76
17	2011	GDP	261764344205.025
18	2012	GDP	259613579190.332
19	2013	GDP	292408330563.864
20	2014	GDP	305674837195.003
21	2015	GDP	296075434804.981

Here ConsGDP is displayed with rows 11 and 22 removed. The NA indicates that data for 2016 hasn't been released yet.

Next the plot is drawn. All of the (x,y) pairs of (year, value) are plotted, each variable becomes a separate line on the graph. If we had included a third variable in the matrix consumption, melt would still have produced a tidy format that would be graphable by the same code.

```
aes(x=year, y=value, group=variable)
```

The last line divides the GDP in 2015 [row10, column3] by the Household consumption of the same year. This code is included directly in the text of the sentence.

As can be seen from the graph, in 2015 Household Consumption was `r percent(fixConsGDP[10,3] / fi`

This research is being conducted in the interdisciplinary field of Israel Studies. It lies at the intersection of sociology and economics. It partially adheres to the practices of reproducible research, i.e. methods are fully reported and the process by which raw data is anaylzed is viewable. Unfortunately, while the housing price data is freely distributable, the household level consumption data is not. This is fully reproducible after obtaining the listed datasets, which are available from the Central Bureau of Statistics and the Israel Social Sciences Data Center. Pseudo-panel construction is the methodology by which I propose to combine the available data on household consumption and house prices.

3.2 data sets

This study combines household level consumption data with housing price data to estimate test the hypothesis that different age cohorts have different wealth effects. It has been postulated that older households will have a higher wealth effect, or larger proportional change in spending in response to a change in wealth than a younger household. The available consumption data from the Household Expenditure Survey provides us with a means to test this hypothesis. Table One shows a listing of the files used in the study. Column 2 - Consumption, names the files from the "Housing Expenditure Survey." Column 3 shows the locations of the housing price data. These are data are released as part of the calculation of the Consumer Prices Index as Table 6.2 - "Average Prices of Owner Occupied Dwellings (NIS Thousand), by Residential Area and Size Groups (Rooms in Dwelling)." The data for the fourteen years in question, 2002-2015 is split among six files that are at different locations, but all named the same thing. These files each contain 8 quarters of data. They are renamed upon download and saved with the filenames in column four. The nine Residental Areas are Jerusalem, Tel Aviv, Haifa, Gush Dan, Center, South, Sharon, North and Qrayot Haifa. Apartments are grouped by number of rooms, 1.5-2, 2.5-3, 3.5-4 and 4.5-5. Also included is an average home price for the Residential Area. This is not an average of the four size groups. These data from the various years are then combined to produce a time-series of home prices from 2002 to 2015 for the nine location/size pairs.

years	Consumption	www.cbs.gov.il/www/ +	houseP_savedAs
2002	requested	MISSING	NA
2003	requested	MISSING	NA
2004	requested	MISSING	NA
2005	f467	archive/200803/price_new/a6_2_e.xls	NA
2006	f468	archive/200803/price_new/a6_2_e.xls	houseP06_07.xls
2007	f469	archive/201003/price_new/a6_2_e.xls	houseP06_07.xls
2008	requested	archive/201003/price_new/a6_2_e.xls	houseP08_09.xls
2009	f472	archive/201203/price_new/a6_2_e.xls	houseP08_09.xls
2010	f471	archive/201203/price_new/a6_2_e.xls	houseP10_11.xls
2011	f459	archive/201403/price_new/a6_2_e.xls	houseP10_11.xls
2012	f458	archive/201403/price_new/a6_2_e.xls	houseP12_13.xls
2013	f457	archive/201503/price_new/a6_2_e.xls	houseP12_13.xls
2014	f456	/price_new/a6_2_e.xls	houseP14_16.xls
2015	requested	/price_new/a6_2_e.xls	houseP14_16.xls

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