

# Wealth and Consumption

Identifying wealth effect on household consumption

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# Overview

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## research question

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*Is increasing wealth positively related to increasing household consumption?*

Heuristic thought: Yes, intuitively

- lifetime consumption theory
- consumption smoothing

Increasing wealth  $\implies$  Increasing lifetime capital  
with consumption smoothing  $\implies$  increasing consumption(current)

We would like to use data to figure out if this thought holds

# Definition

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## *Wealth*

We divide wealth into two categories:

- Financial wealth: instruments like stocks, bonds, mutual funds, and ETFs that individuals or institutions invest in through financial markets.
- Housing wealth/fixed asset wealth: the worth of long-term physical assets owned by the household, such as a house, car, or land.

## *Income*

Here we use gross disposable income

# Data Description

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We use overall 4 variables:

- Consumption
- Disposable income
- Wealth
  - Financial wealth
  - Housing wealth

We consider 2 regions: EU zone and Japan

Tiny differences due to data availability: Japan's fixed asset(Housing wealth) includes durable goods like cars, EU doesn't

- **Source:** DWA(Distributional Wealth Accounts), QSA(Quarterly Sector Accounts) and MNA(Main aggregates national accounts) from European Central Bank (ECB)
- **Description:** Quarterly data
- **Countries/Entities:** 20 EU zone countries
- **API Documentation Link:** `ecbdata`
- **File Path after Downloading:** `data/raw data/EU`
- **Dataset Range:** 2009-01-01 to 2024-10-01
- **Installation:** `pip install ecbdata`

# Japan

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- **Source:** Cabinet Office Japan and Family Income and Expenditure Survey (e-Stat)
- **Description:** Yearly macroeconomic data for Japan
  - Household Consumption (2023)
  - Fixed Assets (2023)
  - Employment Income (2023)
- **Countries/Entities:** Japan
- **Variables:**
  - Household consumption
  - Fixed asset value
  - Stock market financial assets
  - Employee compensation
- **Download Method:** `requests.get()` from official Cabinet Office URLs
- **File Location:**
  - Raw Excel: `data/raw data/japan/{file_name}.xlsx`
  - Processed CSV: `data/processing_data/japan/{file_name}.csv`
  - Final merged: `data/clean/japan/merged_macro_data.csv`
- **Dataset Range:** 1994–2023 (Annual, some quarterly if available)

## Github link

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- Link to Our project github:  
<https://github.com/Graspp-25-Spring/graspp-25S-Wealth-Consumption>



# How to measure wealth effect

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**Elasticity:** percentage change in consumption, followed by percentage change in wealth

**Marginal Propensity to Consume:** one unit change in consumption to one unit change in wealth

Two major metrics used in the relevant literature, sometimes MPC prevails due to a huge gap between financial and housing wealth(M.lacoviello, 2011)

# Model

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We used 2 models to measure wealth effects:

## *Modeling of long run-log model*

- Conducting a regression on the following model:

$$\log C_t = \alpha + \beta \log S_{t-1} + \gamma \log H_{t-1} + \phi \log Y_{t-1} + \varepsilon_t$$

Where:

$C_t$  : Household consumption at time t

$S_{t-1}$  : Lagged stock market wealth at time t-1

$H_{t-1}$  : Lagged housing wealth at time t-1

$Y_{t-1}$  : Lagged employment income at time t-1

$\varepsilon_t$  : Error term

Main Focus

- Estimate and interpret long-run elasticities:

$\gamma$  : Elasticity of consumption with respect to housing wealth

$\beta$  : Elasticity of consumption with respect to stock market wealth

$\phi$  : Elasticity of consumption with respect to income

# Model

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## *Modeling of short run-log difference model*

$$\Delta \log C_t = \alpha + \beta \Delta \log S_{t-1} + \gamma \Delta \log H_{t-1} + \phi \Delta \log Y_{t-1} + \varepsilon_t$$

- Where:

$\Delta \log C_t$  : Growth rate of household consumption

$\Delta \log S_{t-1}$  : Lagged growth rate of stock market wealth

$\Delta \log H_{t-1}$  : Lagged growth rate of housing wealth

$\Delta \log Y_{t-1}$  : Lagged growth rate of employment income

$\varepsilon_t$  : Error term

### Main Focus

- Assess short-run impacts of asset and income growth on consumption growth:

$\gamma$  : Short-run elasticity of consumption with respect to housing wealth growth

$\beta$  : Short-run elasticity with respect to stock market wealth growth

$\phi$  : Short-run elasticity with respect to income growth

# Raw summaries

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Descriptive Statistics for EU (Million Euro)

Variable	Mean	Std. Dev.	Min	Max
Consumption	1,550.83	202.09	1,314.87	2,026.59
Housing Wealth	30,873.34	4,915.20	26,138.31	40,865.96
Financial Wealth	3,950.82	1,150.43	2,433.44	6,028.02
Income	1,786.04	254.35	1,470.22	2,438.20

Descriptive Statistics for Japan (Million Yen)

Variable	Mean	Std. Dev.	Min	Max
Consumption	286.52	9.77	266.25	314.76
Housing Wealth	410.73	13.70	385.54	443.82
Financial Wealth	143.44	48.36	80.11	250.21
Income	268.42	13.73	251.16	302.36

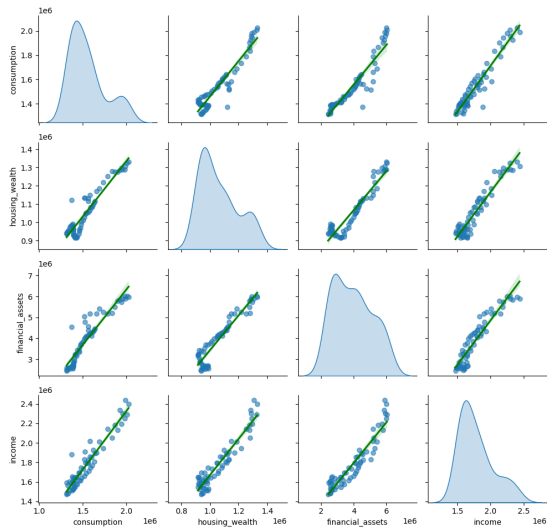
# Observations

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- A higher standard deviation and range in the EU data implies that it experienced more substantial variability(mainly increase).
- On average, housing wealth accounts for a substantially greater fraction of total wealth in the EU relative to Japan

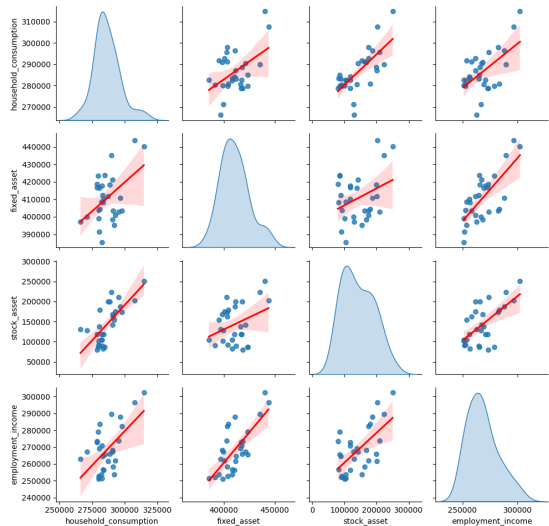
# Correlation of EU

Scatter Plots with Regression Lines



# Correlation of JP

Scatter Plots with Regression Lines



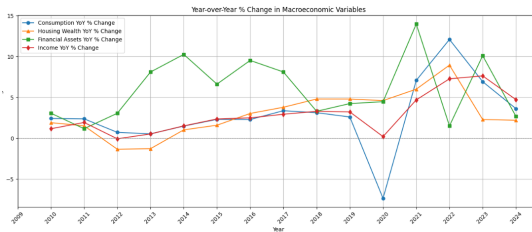
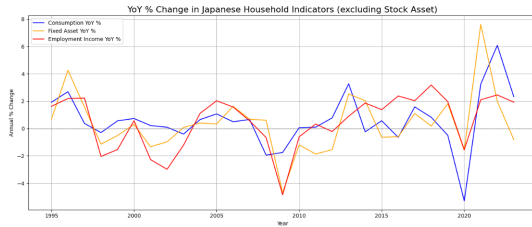
# Observations

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- In EU, consumption, income, financial wealth and housing wealth are strongly correlated
- In Japan, they are not strongly correlated. Especially, consumption vs housing wealth and housing wealth vs financial wealth



# Yearly percentage change



# Regression Results

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MPC computed using elasticity from Matteo Iacoviello, 2011.

Table 1: Elasticity and MPC Estimates by Country and Variable

Country	Variable	Elasticity (LR)	MPC (LR)	Elasticity (SR)	MPC (SR)
EU	Income	0.4694***	0.4078***	0.0828	0.0719
	Financial Wealth	0.0966***	0.0386***	0.3650*	0.1458*
	Housing Wealth	0.2114***	0.0106***	0.8499***	0.0428***
Japan	Income	-0.280	-0.2988	-0.1399	-0.1493
	Financial Wealth	0.0632***	0.1271***	0.2395	0.4816
	Housing Wealth	0.2371	0.1653	0.0189	0.0132

Notes: LR = Long-run estimates from log-level models; SR = Short-run estimates from log-difference models. MPC is calculated as elasticity divided by average wealth-to-consumption ratio. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.10$ .

## Basic interpretation

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EU:

- The elasticity of consumption to housing wealth in long run model is 0.21, and to financial wealth is 0.10; in short run model the result is 0.85 and 0.37 respectively
- Convert it to MPC to get intuition
- In long run, one euro increase in housing wealth generates 1 cent increase in consumption; one euro increase in financial wealth generates 4 cents increase in consumption

JP:

- In long run, 100 yen increase in housing wealth generates 17 yen increase in consumption and 100 yen increase in financial wealth generates 13 yen increase in consumption

# Household Consumption Dynamics: EU

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## Overview

- Household consumption shows a steady upward trend over time.
- Closely tracks the rise in employment income and housing wealth.
- Sharp decline in 2020 followed by a swift rebound reflects the COVID-19 consumption shock and recovery.

## Long-Run Model

- Employment income, housing wealth, and financial assets are all positively and significantly associated with household consumption.
- Income has the largest and most statistically robust effect.
- Indicates a strong long-run income–consumption linkage.

## Short-Run Model

- Only housing wealth growth is significantly correlated with changes in consumption.
- Changes in income and financial wealth have no significant short-term impact on consumption growth.

# Household Consumption Dynamics: Japan

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## Long-Run Model

- Stock market wealth (financial assets) has a statistically significant positive effect on household consumption.
- Suggests capital gains may directly influence consumer behavior.
- Although housing wealth has a relatively larger coefficient, it is not statistically significant.
- Implies that short-run consumption is less responsive to real estate fluctuations.
- Employment income shows no significant short-run effect, possibly due to Japan's stable and slowly adjusting wage system.
- The short-run marginal propensity to consume (MPC) from financial wealth exceeds that from income.
- Indicates stronger consumption sensitivity to asset changes in the Japanese context.

# Does Household Consumption Rise with Wealth?

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## EU

- **Yes.** Strong long-run relationship between wealth and consumption.
- All components—employment income, housing wealth, and financial assets—significantly drive long-run consumption.

## Japan

- **Partially.** Short-run sensitivity to financial (stock market) wealth.
- Housing wealth and income do not show significant short-run effects.
- Suggests consumption reacts more to capital gains than wage or housing changes.

## Discussion

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- D. May, G. Nodari, and D. Rees (2019) use Australian quarterly data from 1988 to 2008 and find that the marginal propensity to consume (MPC) out of financial wealth is significantly higher than that out of housing wealth, consistent with our findings for the EU.
- Ricardo M. Sousa (2009) analyzes EU data from 1980 to 2007 and also finds evidence of a wealth effect, with consumption being more responsive to financial wealth than to housing wealth.
- In contrast, Charles W. Calomiris, Stanley D. Longhofer, and William Miles (2012) study U.S. state-level data and conclude that consumption is more sensitive to housing wealth than to financial wealth.
- M. Iacoviello (2011) notes that “the larger sensitivity of consumption to housing wealth is one of the many reasons why policymakers might be more worried about changes in housing than non-housing wealth,” which differs from our EU-based findings.

## Discussion

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For Japan, identifying the wealth effect proves difficult. The data show unusual patterns, possibly due to Japan's unique socioeconomic conditions. This suggests that a more dedicated modeling approach may be necessary to uncover any underlying relationship.



# References I

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Diego May, Gabriela Nodari, and Daniel Rees. *Wealth and Consumption*, Reserve Bank of Australia Bulletin, March 2019. <https://www.rba.gov.au/publications/bulletin/2019/mar/pdf/wealth-and-consumption.pdf>



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