SECOND INTERNATIONAL WORKSHOP - MOSPI PROJECT

The Treasury DYnamic Microsimulation Model (T-DYMM): structure, preliminary results and future implementations
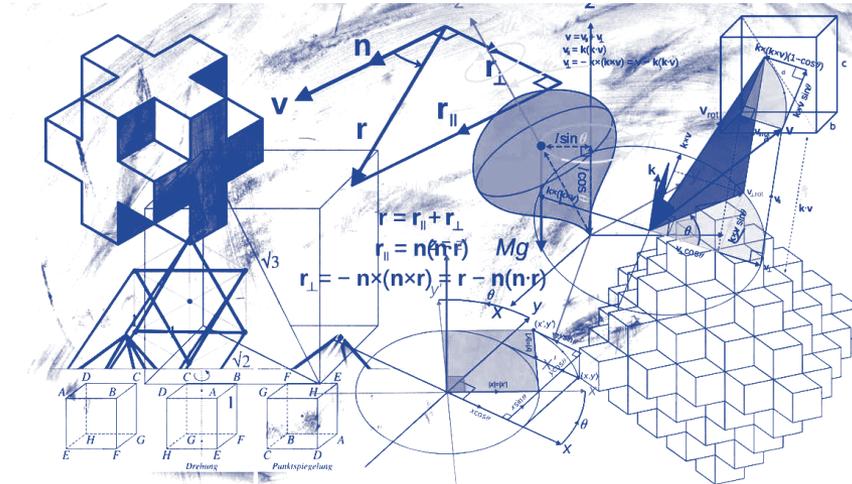
With Financial Support from the European Union

PANEL 2
Labor Market and Wealth

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Outline

- Aim and definitions
- Wealth data: use of administrative data (Department of Finance, DF), matching AD-SILC-SHIW (Bank of Italy, BI).
- Structure of the wealth module, based on Tedeschi et al. (2013)
- Estimates & alignments
- Focus on consumption & financial investments
- Preliminary simulation results

Aim and definitions

- One of the novelties of T-DYMM 3.0: introduction of a wealth module, that accounts for the household wealth dynamics.

- Modelling private wealth may provide a more complete picture of disposable income and households' well-being distribution before and after retirement.

- Private pensions: additional form of wealth accumulation collected at retirement.

- We define net wealth as the sum of real and financial wealth to which we subtract liabilities.

- Property of houses is the only form of real wealth.

- Financial wealth is divided in liquidity, government bonds, corporate bonds and stocks.

Data (1) – House or real wealth

- Wealth data are collected and analysed at the household level.

- House wealth is constructed based on the administrative data provided by the DF (two data sources: Cadaster and Tax-returns)

- In the model, we divide the household real wealth in two subgroups, first house value and other houses value.

- The administrative dataset is compared with wealth macro aggregates from the BI and the DF.

- Comparison with SHIW micro data:

  - House wealth Gini index: SHIW (2016) = 0. 411; AD-SILC 3.0 (2015): 0.448.

  - Peculiarity of the AD-SILC 3.0 dataset: the number of other houses is considerably higher than the number found in survey data.

Data (2) – Financial wealth

- Financial wealth is constructed based on the statistical matching between SHIW and SILC (following Pisano & Tedeschi, 2014).

- Donor dataset is smaller than recipient dataset. Common Z: socio-demographic characteristics . Specific X: wealth vector from SHIW . Specific Y: other variables from SILC.

- Propensity score matching (PSM): based on the definition of a distance function that evaluates the similarity among units of two samples and provides each unit of a sample with a "similar" unit from the other sample.

- Distance function: Mahalanobis distance

- Issues of under-reporting in ownership and amount of financial activities in SHIW (Brandolini et al, 2009; D'Aurizio, 2006).
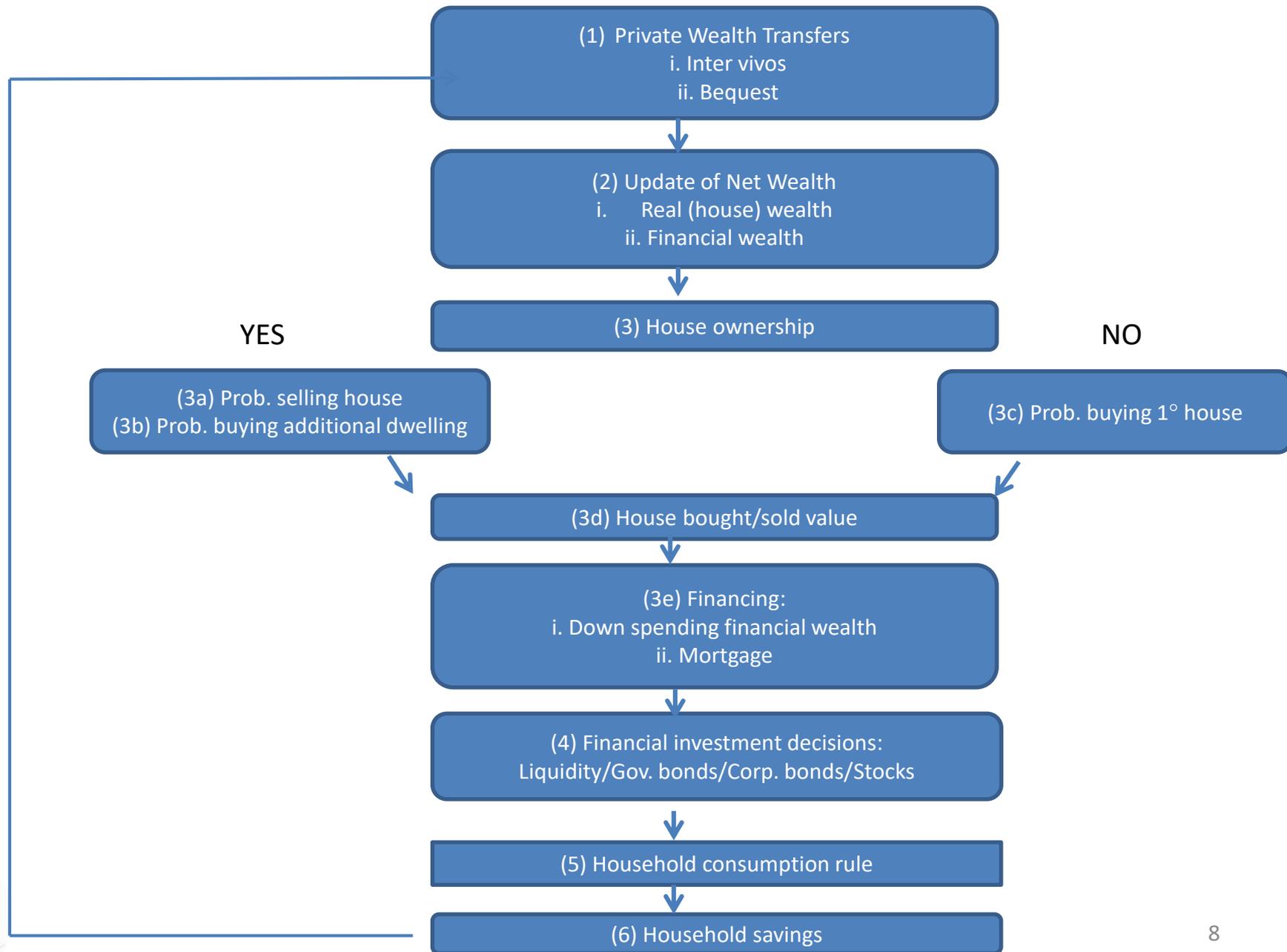
The Modules of T-DYMM
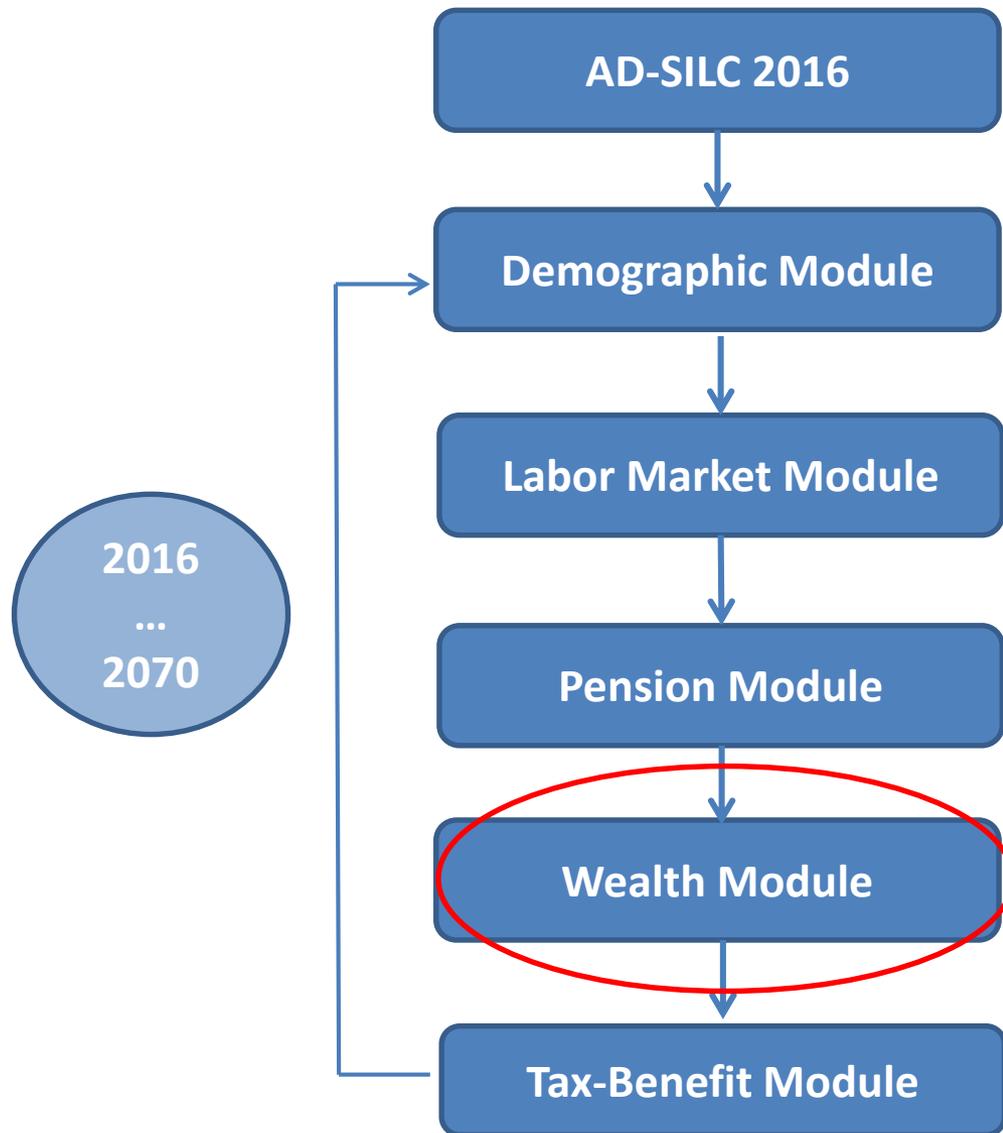
The private pensions sub-module

- Choice whether to participate to II or III pension pillar.

- II pillar: «fondi negoziali», workers who participate may devolve their TFR (Trattamento di Fine Rapporto, end-of-service allowance) and voluntary contributions.

- III pillar: either «fondi aperti» or «piani individuali pensionistici». Contribution to the fund may vary yearly for each registered individual.

- The investment in II or III pillar provides a certain return that is computed using COVIP data when available (2016-19) and projections based on the portfolio composition of pension funds for the rest of the simulation (2020-50).

The wealth module: scheme

(1) Private Wealth Transfers
i. Inter vivos
ii. Bequest

(2) Update of Net Wealth
i. Real (house) wealth
ii. Financial wealth

(3) House ownership

YES

NO

(3a) Prob. selling house
(3b) Prob. buying additional dwelling

(3c) Prob. buying 1° house

(3d) House bought/sold value

(3e) Financing:
i. Down spending financial wealth
ii. Mortgage

(4) Financial investment decisions:
Liquidity/Gov. bonds/Corp. bonds/Stocks

(5) Household consumption rule

(6) Household savings

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The wealth module: estimates and alignments

- Estimates based on SHIW micro-data (waves 2002-2016).

- Discrete choice model (logit) for discrete transitions (buying/selling houses, receive intergenerational transfers, make donations, rent the second house)

- Log-continuous regression or continuous regression for quantities (either levels or ratios of income or financial wealth)

- Alignments:

  - ISTAT for total houses bought and sold and aggregate saving rate.

  - DF for number of rented houses.

  - COVIP for participants to the private pension schemes.

  - Returns rate on financial investments follow projections by AWG, OECD and historical data from S&P.

Focus (1): Consumption

- Panel estimates of log consumption, data: SHIW 2002-16.

- FE estimator, correlation between error component and unobserved time-invariant household effect is introduced in the simulation.

- Life-cycle features: wealth, future developments (role of expectations, policies)

- Correction for income endogeneity (due to simultaneity and measurement error), IV estimation.

- Alignment: difference between micro data and macro aggregates (see Cifaldi and Neri, 2013) – saving rate equals 10.5% in 2015 according to ISTAT.

# Focus (1): Consumption, panel regression estimates (SHIW 2002-16)

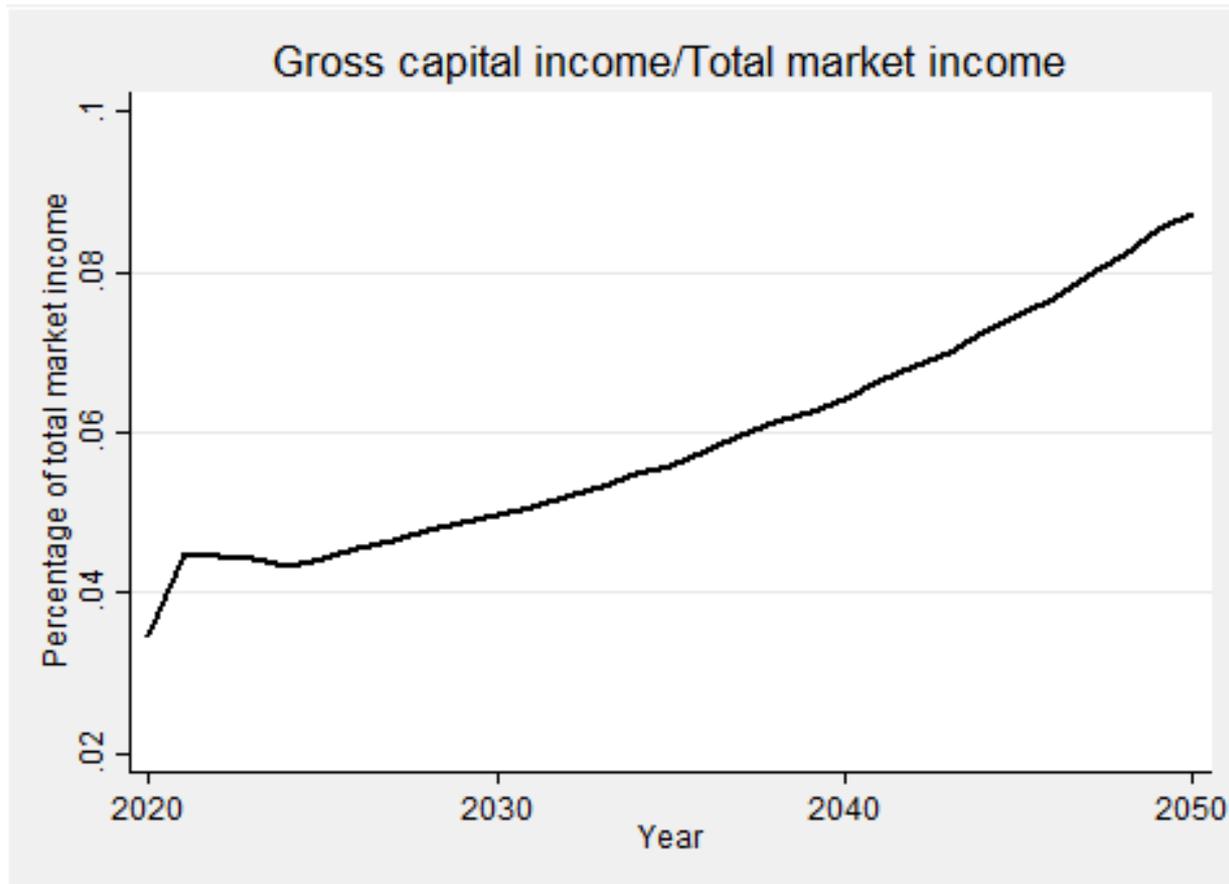|	log-consumption	
	b	se
age	0.011***	(0.001)
qy=2	0.212***	(0.012)
qy=3	0.304***	(0.013)
qy=4	0.376***	(0.014)
qy=5	0.450***	(0.015)
qy=6	0.520***	(0.016)
qy=7	0.580***	(0.016)
qy=8	0.661***	(0.018)
qy=9	0.700***	(0.019)
qy=10	0.791***	(0.022)
log_fin_wealth	0.008***	(0.001)
no. components	0.038***	(0.006)
retired=1	-0.065***	(0.011)
no. earners	0.033***	(0.007)
Constant	8.170***	(0.045)
σ_u	0.383	
σ_e	0.355	
ρ	0.538	
R^2-within	0.145	
R^2-between	0.460	
R^2-overall	0.381	
Nr of obs	39559	

Focus (2): Financial investment decision

- Probability of investing in one of the four forms of financial activities.

- Current procedure: two steps estimation for ownership and ratio of the specific financial activity over the total.

- Estimates based on SHIW.

- Inclusion of financial literacy as a determinant of the investment choice.

- Next econometric improvements:

  – Heckman two-step procedure (probit in the first stage), Tobit model

  – Persistence (dynamic component)

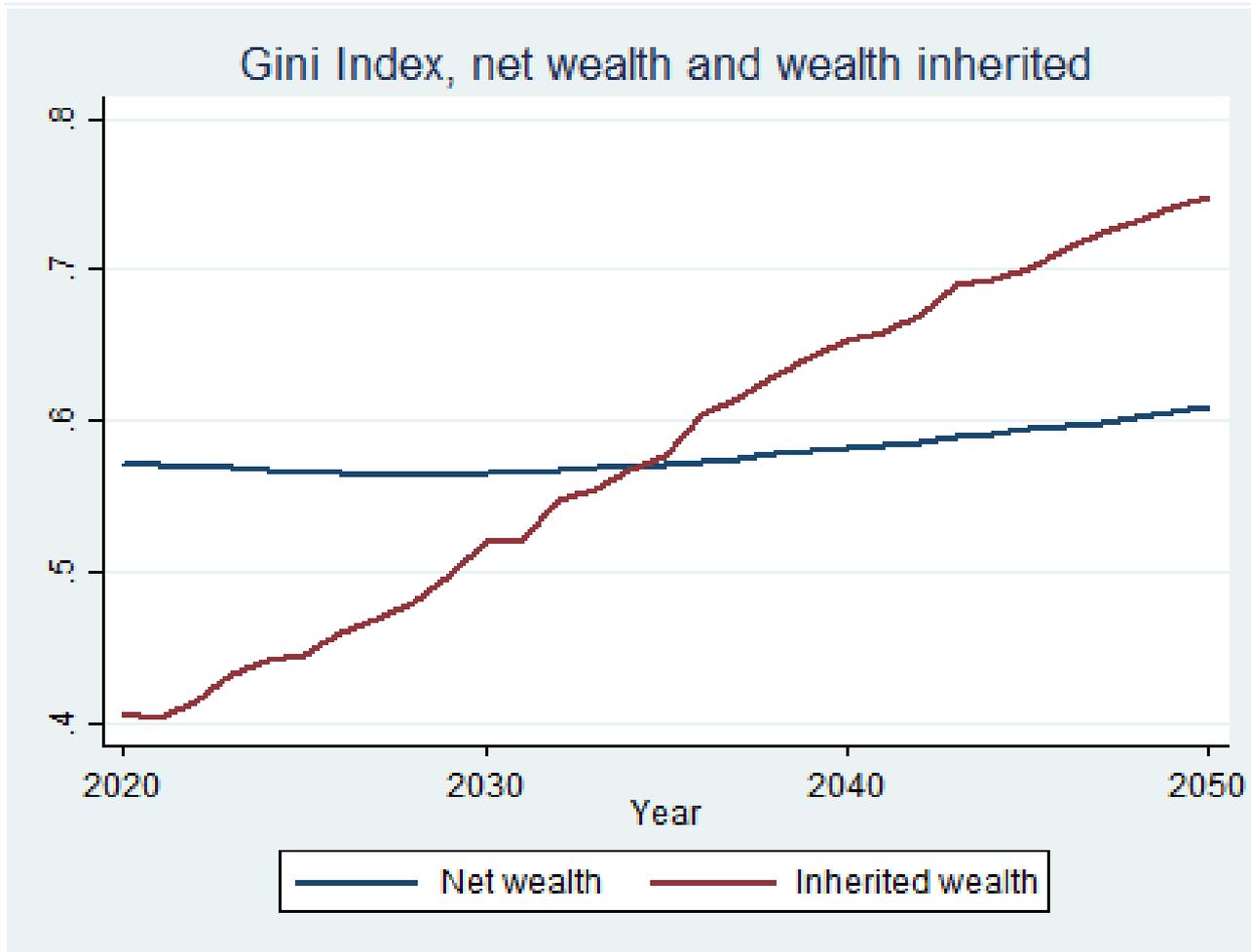 – SUR model, simultaneous or structural equation modeling

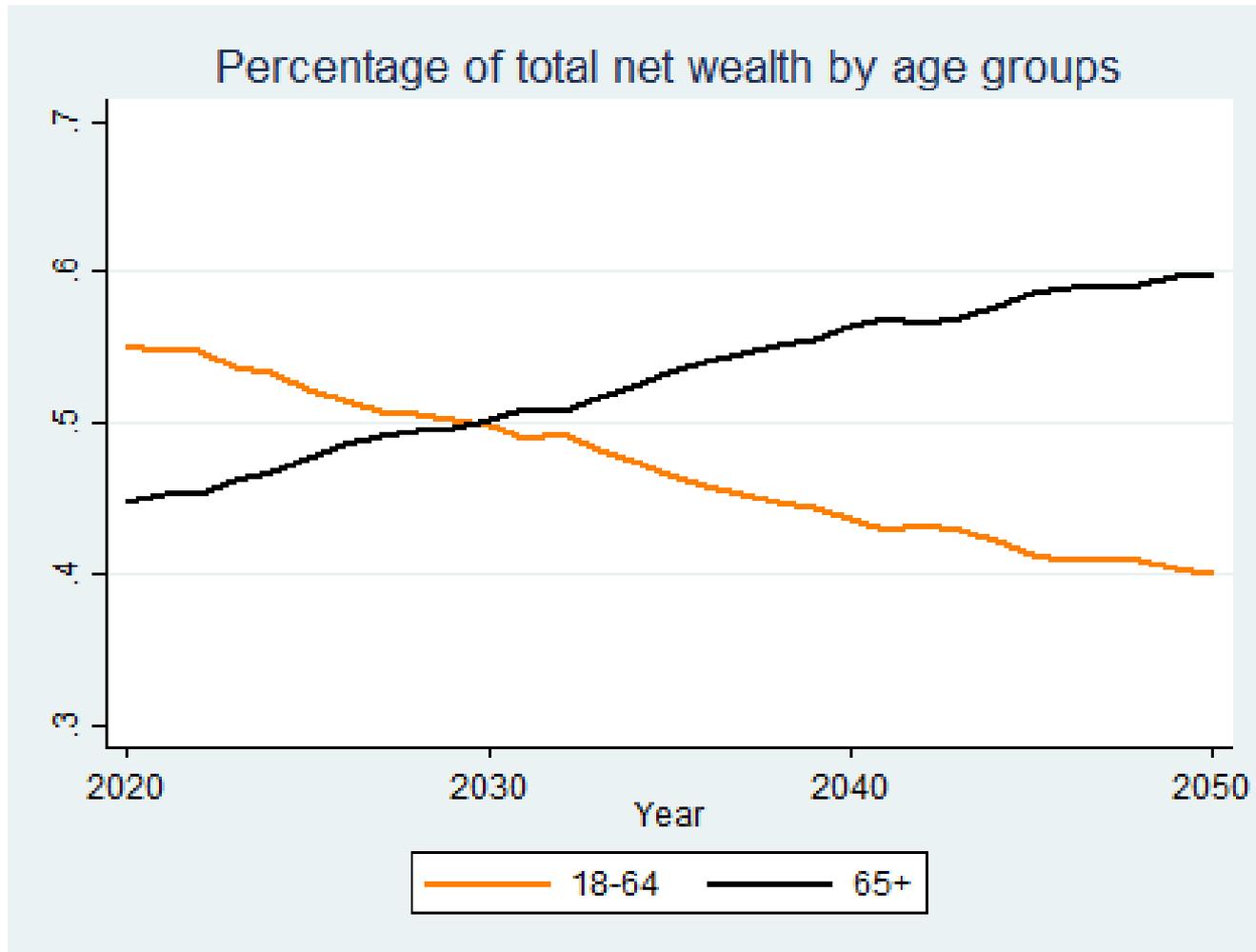# Preliminary simulation results (1): wealth inequality
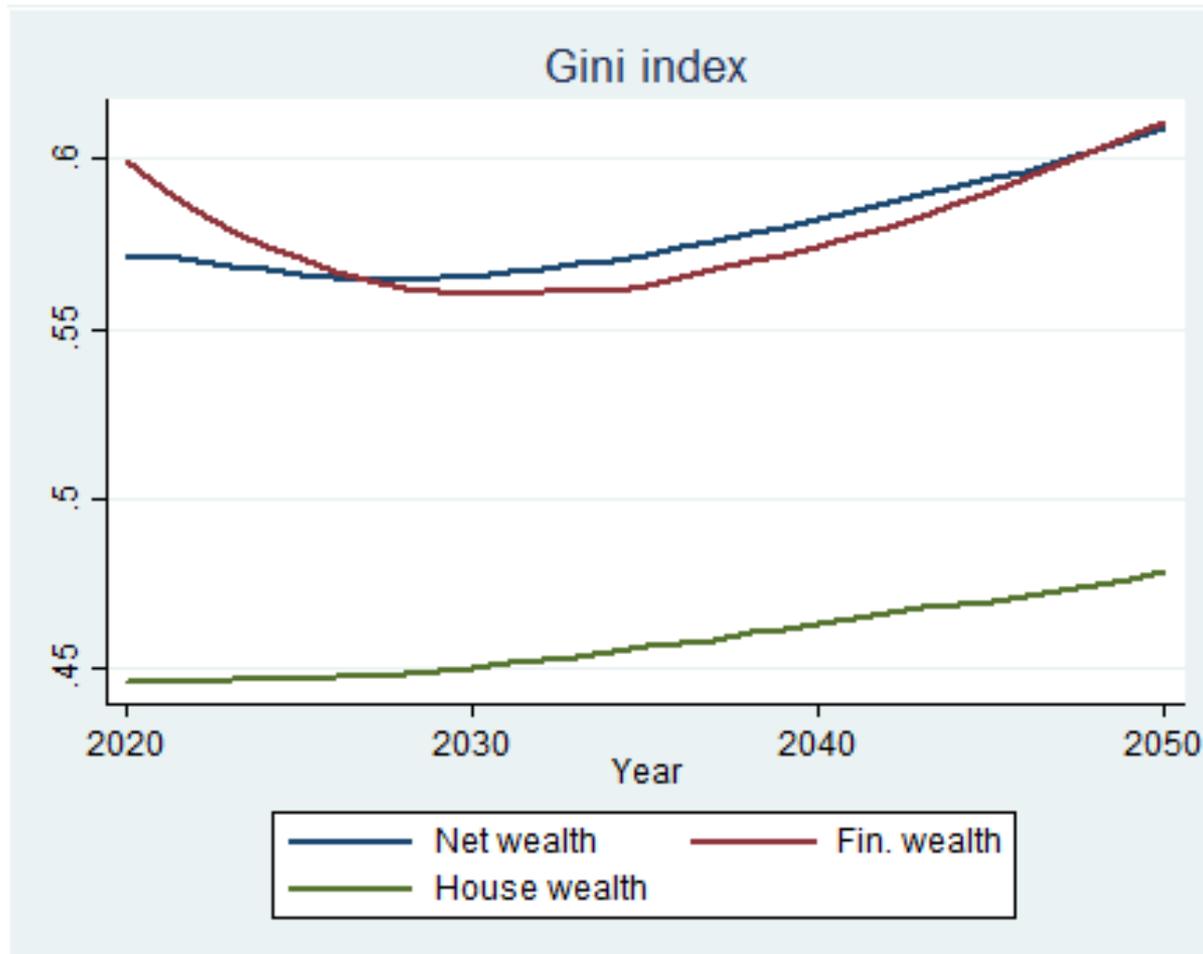
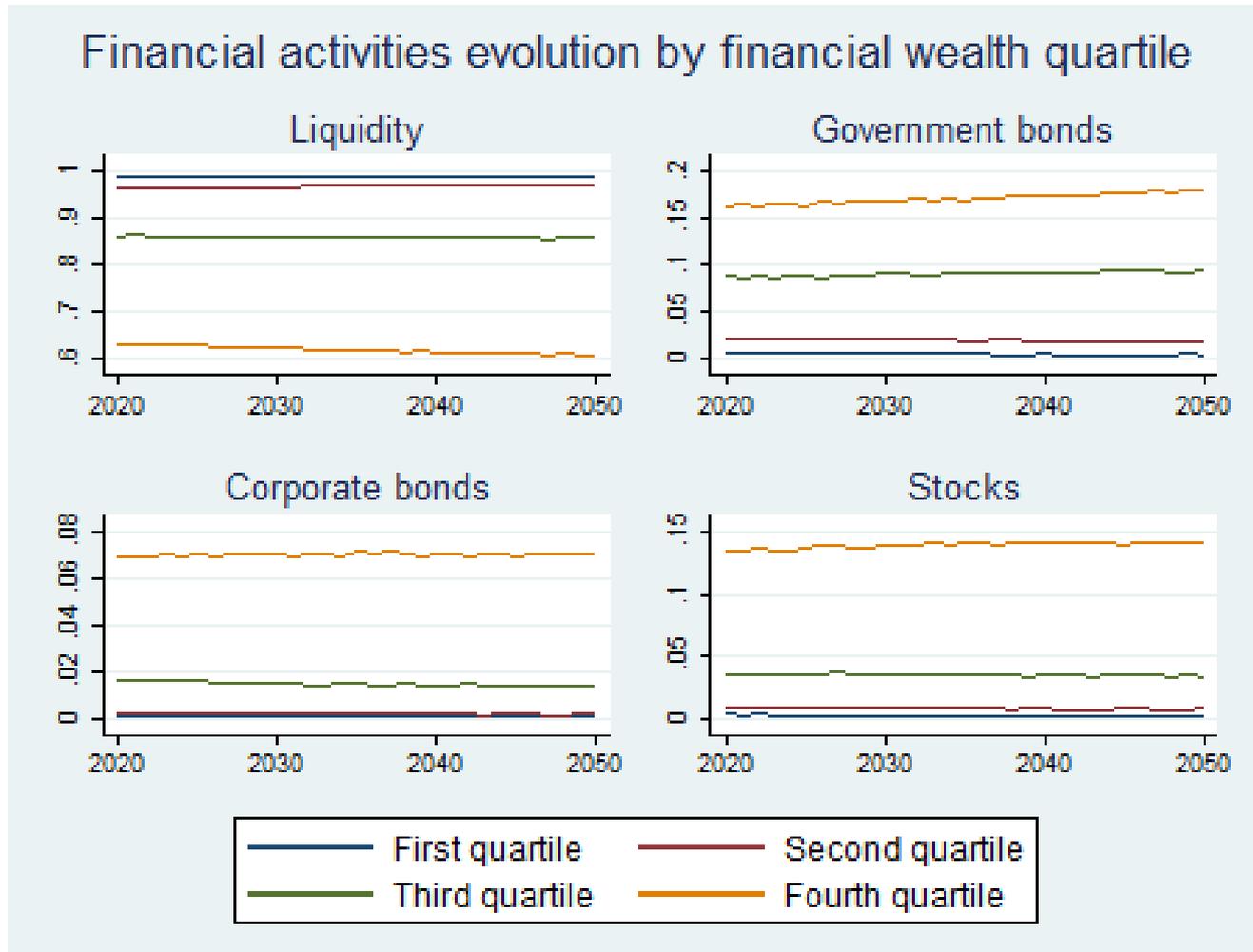# Preliminary simulation results (2): role of capital income

Gross capital income/Total market income

Preliminary simulation results (3): inheritance

Gini Index, net wealth and wealth inherited

Preliminary simulation results (4): wealth by age

Percentage of total net wealth by age groups

Legend: 18-64 (orange), 65+ (black)

Preliminary simulation results (5): financial activities

Financial activities evolution by financial wealth quartile

Future developments

- Correction for under-reporting of financial activities in the starting year of the simulation.

- Variability in returns to risky financial investments.

- Introduction of life-cycle components in the estimate of consumption function taking into account the permanent income hypothesis (possible behavioural changes in household savings).

- Increase the relevance of the financial literacy as a determinant for financial choices by improving individual evolution over time and alignments.

MOSPI
Social protection systems

References

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- Cifaldi, G., and Neri, A. (2013). Asking income and consumption questions in the same survey: what are the risks?. Bank of Italy Temi di Discussione (Working Paper) No, 908.

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- Pisano, E. and Tedeschi S. (2014). Micro data fusion of Italian expenditures and incomes surveys. No. 164.

- Tedeschi S., Pisano E., Mazzaferro C. and Morciano M. (2013). Modelling Private Wealth Accumulation and Spend-down in the Italian Microsimulation Model CAPP_DYN: A Life-Cycle Approach. International Journal of Microsimulation, 6(2):76-122.