Japanese Government Bonds and Aging
School of Political Science and Economics, Waseda University

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Source: Ministry of Finance
Gross general government debt (in trillion yen)

Data source: BOJ
“Securities other than stocks” (in trillion yen)
Data source: BoJ
JGB holdings by type
Data source: BoJ
Aging can affect net bond supply

- Aging may increase the net supply
  - More JGB issuance to finance chronic fiscal deficits
  - Less JGB holdings by banks as deposits shrink

- Aging may also decrease the net supply
  - More demand for annuity products
  - Deflationary effect?

- A supply and demand imbalance in JGB markets could destabilize bond yields
Net JGB purchases by the BoJ and the government and "government" agencies

(in 100 millions of yen, Data source: JSDA)
Net JGB purchases
(in 100 million yen, Data source: JSDA)
Net JGB purchases by Life & Non-Life Insurance Companies
(in 100 millions of yen, Data source: JSDA)
The stock of JGB holdings by retail investors, Source: MoF
How does bond supply affect JGB yields?

- The supply effect has not been a focus in modern general equilibrium asset pricing theories
- Wallas’s (1981) irrelevance theory
- Preferred habitat (PH) theory
  - Risk-averse arbitrageurs
  - PH investors
- In Japan, the PH motive appears strong
  - The fiscal and monetary authorities
  - Insurance companies and pension funds
  - BoJ’s QQE since April 2013
change in bond supply

change in bond yield
Preferred habitat effect (Cochrane’s chart)
Estimating the supply effect

- A simple regression approach
  \[ N\text{-period bond yield}_{t} = \alpha + b*S_{t} + B*X_{t} + \text{error}_{t} \]
  S: a supply variable
  X: control variables

- Model based approaches
  - Greenwood and Vayanos (2013)
  - Hamilton and Wu (2012)
How are supply and maturity structure of JGBs related to their excess returns?

In both effective lower bound (ELB) and normal environments?

Bond excess returns are more sensitive to bond supply in the absence of lower bound of interest rate, unless arbitrageurs become willing to take on more risks.
Koeda (2016, JER)

- Estimates a discrete version of Vayanos and Vila’s (2009) model (An extension of Hamilton and Wu (2012))
  - Two types of agents: arbitrageurs and preferred-habitat investors
    - Preferred-habitat investors: the fiscal and monetary authorities and insurance companies and pension funds
  - Two regimes: the normal and ELB regimes
  - The bond market equilibrium price is
    - Determined by equating (net) arbitrageurs’ demand and preferred-habitat investors’ supply for different maturities of bonds
    - An affine function of latent yield-curve factors
Risk-premium changes in response to the benchmark maturity swaps (in annualized rate in bpts)

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Seeing how far you can go

Japan

Ten-year government-bond yield, %

General government gross debt, % of GDP

Sources: IMF; Thomson Reuters

Economist.com
Should the MoF increase the maturity of JGB issuances?

- The traditional tradeoff between rollover risk and borrowing cost
  - Ricardian equivalence does not hold
  - Expectations hypothesis does not hold
- The tradeoff argument is not readily applicable to Japan
  - Fiscal sustainability is a prerequisite for achieving the optimal debt management policy
- Intergenerational inequality needs to be discussed