

Inflation and the Redistribution of Nominal Wealth

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Introduction and Roadmap

- Quantifies the redistributive effects of inflation

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- Quantifies the redistributive effects of inflation
- Document nominal asset positions in US
 - Across sectors (household, rest of the world, government)
 - Across households (by age and income/wealth)
- Redistributive effect of an unexpected inflation episode

Nominal Assets and Liabilities
in the U.S. Economy

Net Nominal Positions (NNP)

(market value nominal assets) - (market value liabilities)

- Includes indirect positions
 - Ex: ownership of mutual funds or a firm
- Nominal payoff fixed by contract
 - $\{v_{t,s}^j\}_s$: deterministic sequence of payments
 - j =instrument; $t+s$ =date of payment
 - Ex: n-zero coupon bond $v_t^n = (0, 0, 1, 0, \dots)$

- Market value

$$M_t^j = \sum_{s=1}^{\infty} \exp(-i_{t,s}) v_{t,s}^j$$

- $i_{t,s}$: nominal i-rate of a s-zero coupon bond

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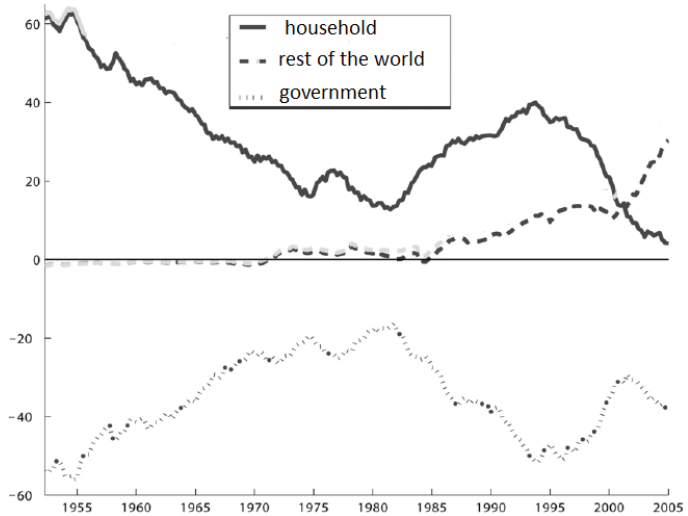
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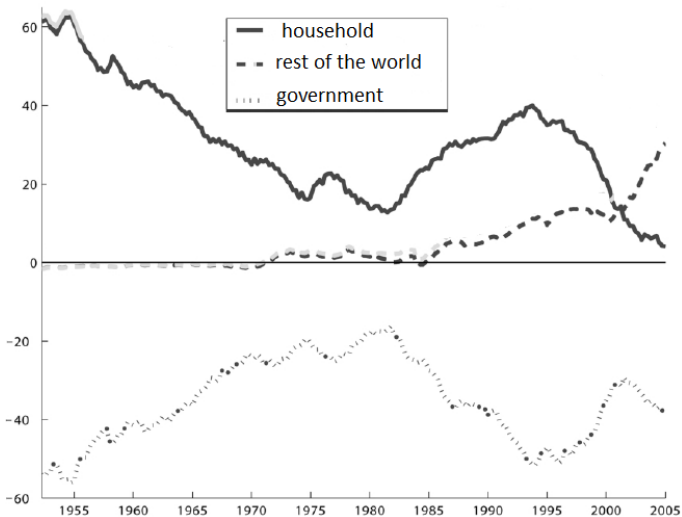
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- Challenge
 - Real world (v is state contingent); Here (v is deterministic)

Net Nominal Positions By Sectors (% GDP)



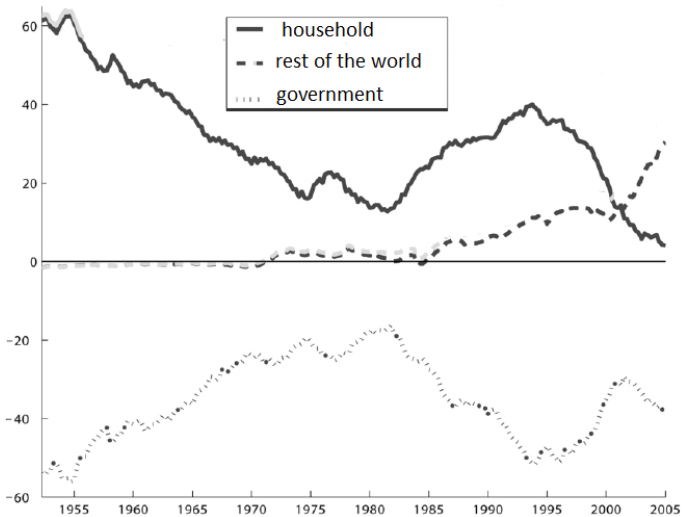
Net Nominal Positions By Sectors (% GDP)

Before 80', households are creditors/ the government is a debtor



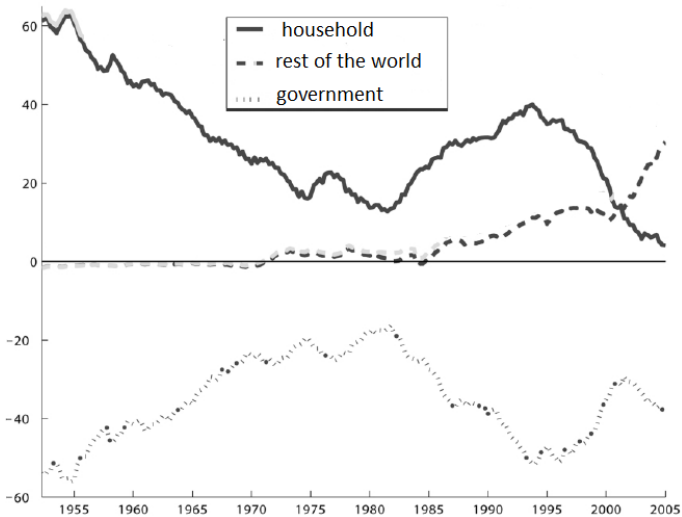
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After 80', the rest of the world is a creditor



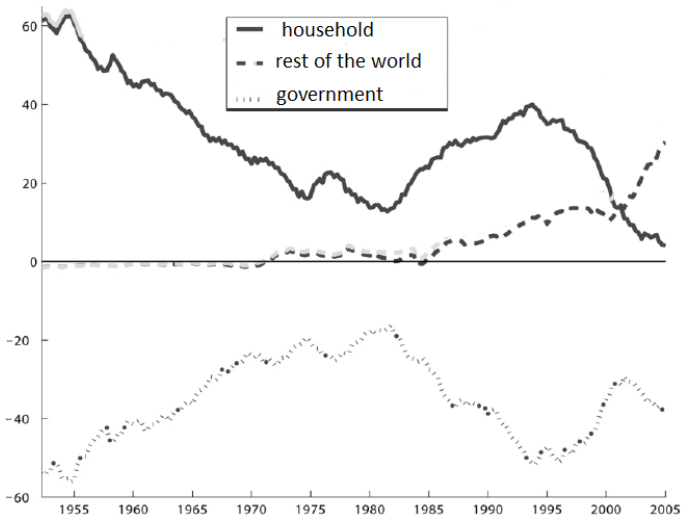
Net Nominal Positions By Sectors (% GDP)

After 2000, the RoW is the main creditor of the gov.



Net Nominal Positions By Sectors (% GDP)

In 2000, RoW and households are equal creditor



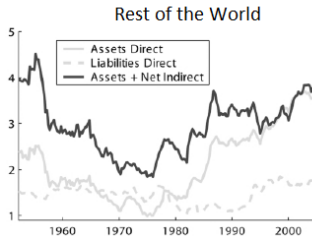
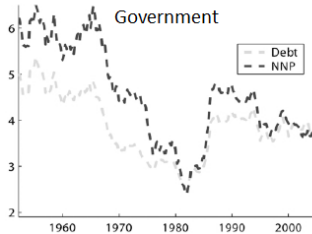
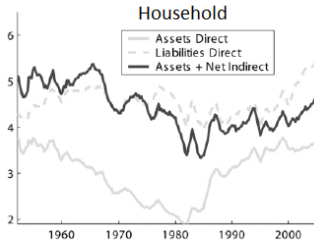
Sectoral Positions Maturities

- Value-weighted average maturity

$$D_t^j = \sum_{s=1}^{\infty} s\omega_{t,s}^j \quad \text{with} \quad \omega_{t,s}^j = \frac{\exp(-i_{t,s}s) v_{t,s}^j}{M_t^j}$$

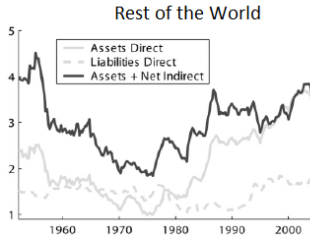
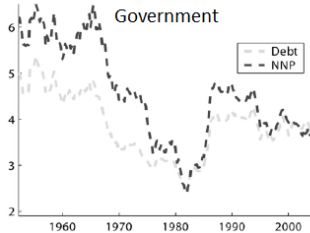
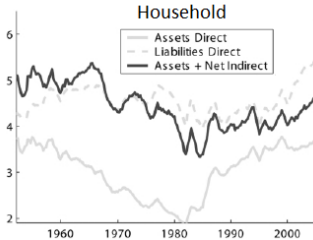
- $\omega_{t,s}^j$: discounted relative payment at period $t+s$
- **Direct position**
 - Direct held asset/liability
 - Ex: Households buy a U.S. Treasuries
- **Indirect position**
 - Direct position + claims on investment intermediaries and firms
 - Ex: Households buy a share of a firm that holds U.S. Treasuries

Maturities by Sectors



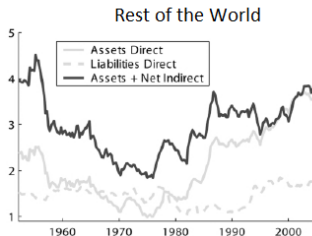
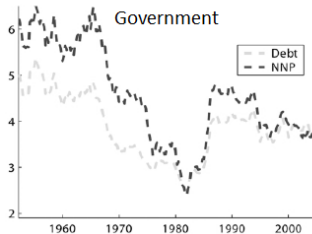
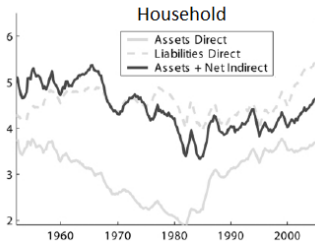
Maturities by Sectors

Before 80', decreasing maturity of households assets (=gov. debt)



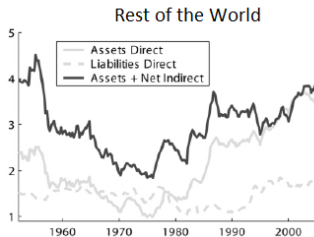
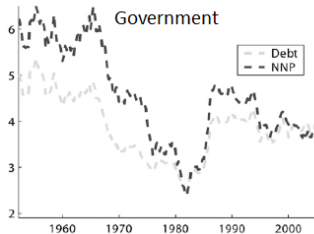
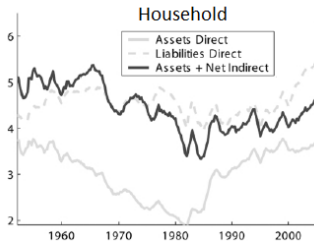
Maturities by Sectors

Recently, maturity increases across sectors



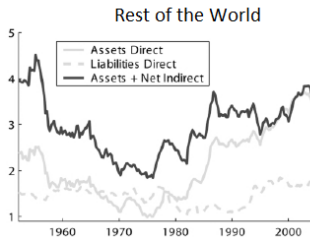
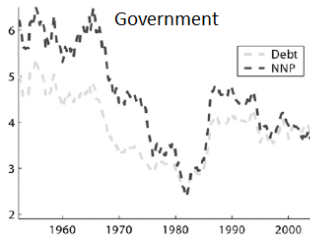
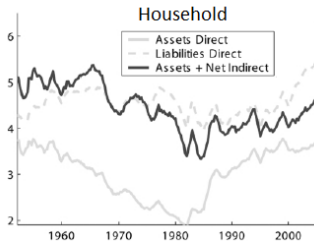
Maturities by Sectors

Households: \uparrow Mortgage finance with long-term bond



Maturities by Sectors

Large maturity mismatch in the rest of the world



Net Nominal Positions Across Households

- Report for 1989
- Divide households by
 - **Cohorts:** household head age $\leq 35, 36-45, \dots, 66-75, \geq 76$
 - **Rich:** 10 % of households with highest net worth
 - No Rich:
 - **Middle Class:** 70 % of households with highest income
 - **Poor:** 20 % of households with lowest income
- Report Net Nominal Positions / net worth

Net Nominal Positions Across Households

	≤ 35	36-45	46-55	56-65	66-75	≥ 76
poor	-36	-33	-5.5	7	17	26
middle class	-114	-31.6	-4.8	14	25	38
rich	-14	3.8	6.6	16	16	27

- Young households are debtors/old households are creditors

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 - Young households are large debtors (mortgage=long maturity)
 - Old households are large creditors (short term debt)

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- Lower net nominal positions (large equity holdings)
- NNP with long maturity

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Facts to Remember After 1980

- Government
 - Debtor
- Rest of the world
 - Creditor
 - Large maturity mismatch (short M. liabilities/long M. assets)
- Households
 - Creditors (long maturity liabilities)
 - Young households are debtors
 - Middle class larger debtors with long maturity
 - Poor are debtors with short maturity
 - Old households are creditors
 - Middle class: larger creditors with short maturity
 - Rich: smaller creditors with long maturity

Experiment

An increase of 5 % of inflation
over the next 10 years (in 1989/2001)

Redistribution Under Two Scenarios

- Full Surprise (FS): jump of the value of a dollar at date t

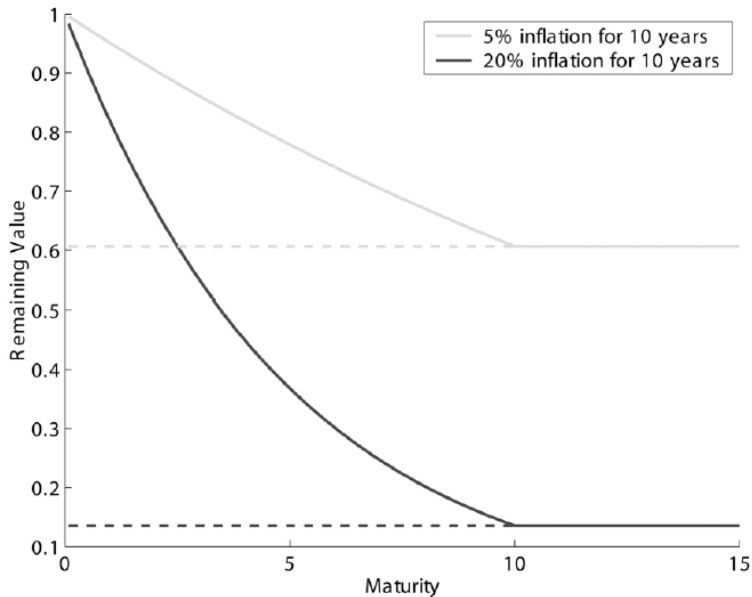
$$M_t^{j,FS} = \exp(-\Delta T) M_t^j$$

- Δ : annual inflation
 - Independent of the maturity
- indexing ASAP (IA): perfect adjustment in the (intertemporal) price of a dollar

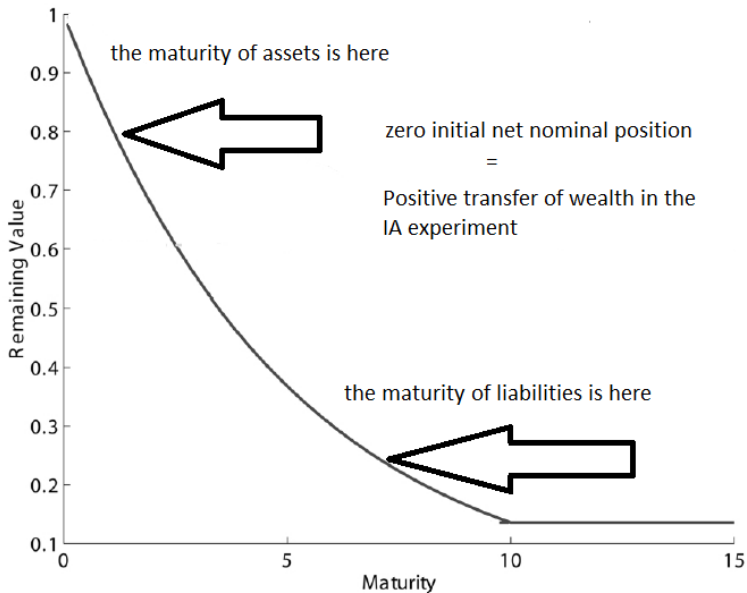
$$M_t^{j,IA} = \sum_{s=1}^{\infty} \exp(-\tilde{i}_{t,s}s) v_{t,s}^i = \sum_{s=1}^{\infty} \exp(-i_{t,s}s - \Delta \min\{s, T\}) v_{t,s}^i$$

- Real i-rate doesn't change ($(\uparrow) i = (=) r + (\uparrow) \pi$)
- Dependents of the maturity

FS/IA with a n-year zero coupon bond



Redistribution through Maturity



Redistribution Across Sector (% GDP)

	Government		R.o.t.W		Households	
	FS	IA	FS	IA	FS	IA
1989	13	5	-5	-3	-7	-2
2001	11	4	-8	-5	-1	1

1. Government : clear winner
2. Rest of the World : clear loser
 - o Implicit default on debt
 - o 1989: smaller lender with long maturity
 - o 2001: NNP as household with long maturity asset
3. Households : redistribution depends on FS/IA and year
 - o 2001: NNP as R.o.t.W. with long maturity liabilities

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Conclusions and Open Questions

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