Monetary Policy with Many Agents

Edmund Crawley and Seungcheol Lee

How do interest rate changes affect consuption behavior?

Standard New Keynesian Theory $\Longrightarrow$ Intertemporal Substitution

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Recent Theory
Income and Redistribution
Effects are Large

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Recent Empirics
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Standard New Keynesian Theory $\Longrightarrow$ Intertemporal Substitution

Recent Theory	Recent Empirics
Income and Redistribution	Income and Redistribution
Effects are Large	Effects are Large

BUT - the mechanisms are very different

How do interest rate changes affect consuption behavior?

Recent Theory (HANK)

- Countercyclical profits and govt redistribution play large role
- No private debt

Recent Empirics

- Unhedged interest rate exposure
- Income sensitivity to business cycles

This paper - attempt to bring models closer to empirics

Some Motivation from Denmark

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Medium MPX
≈ 0.5

High MPX
≈ 0.8

Low MPX
≈ 0.25

MPX: Marginal Propensity to eXpend (includes durables)

Some Motivation from Denmark

Medium MPX
≈ 0.5

High MPX
≈ 0.8

Low MPX
≈ 0.25

↙

Decrease spending
a *lot*

↘

Increase spending
a *little*

Some Motivation from Denmark

Medium MPX
≈ 0.5

High MPX
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Low MPX
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1yr rate ↑ 1%

Aggregate Spending ↓ 26 basis points

Through this redistribution channel *alone*

Auclert's Decomposition

How does Monetary Policy Effect Aggregate Consumption?

- Intertemporal Substitution
- Aggregate Income

} Representative Agent Channels

Auclert's Decomposition

→ Dominates in Rep. Agent NK models

How does Monetary Policy Effect Aggregate Consumption?

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→ Large in Spender-Saver, or TANK models

Auclert's Decomposition

How does Monetary Policy Effect Aggregate Consumption?

- Intertemporal Substitution
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} Representative Agent Channels

- Fisher (Inflationary debt relief)
- Earnings Heterogeneity
- Interest Rate Exposure

} Redistribution Channels

Two Agent New Keynesian Models (TANK)

- Simplest Model with Redistribution Channels
- Widely used by Policy Institutions (esp. for Fiscal Policy)
- Many insights carry over to HANK models

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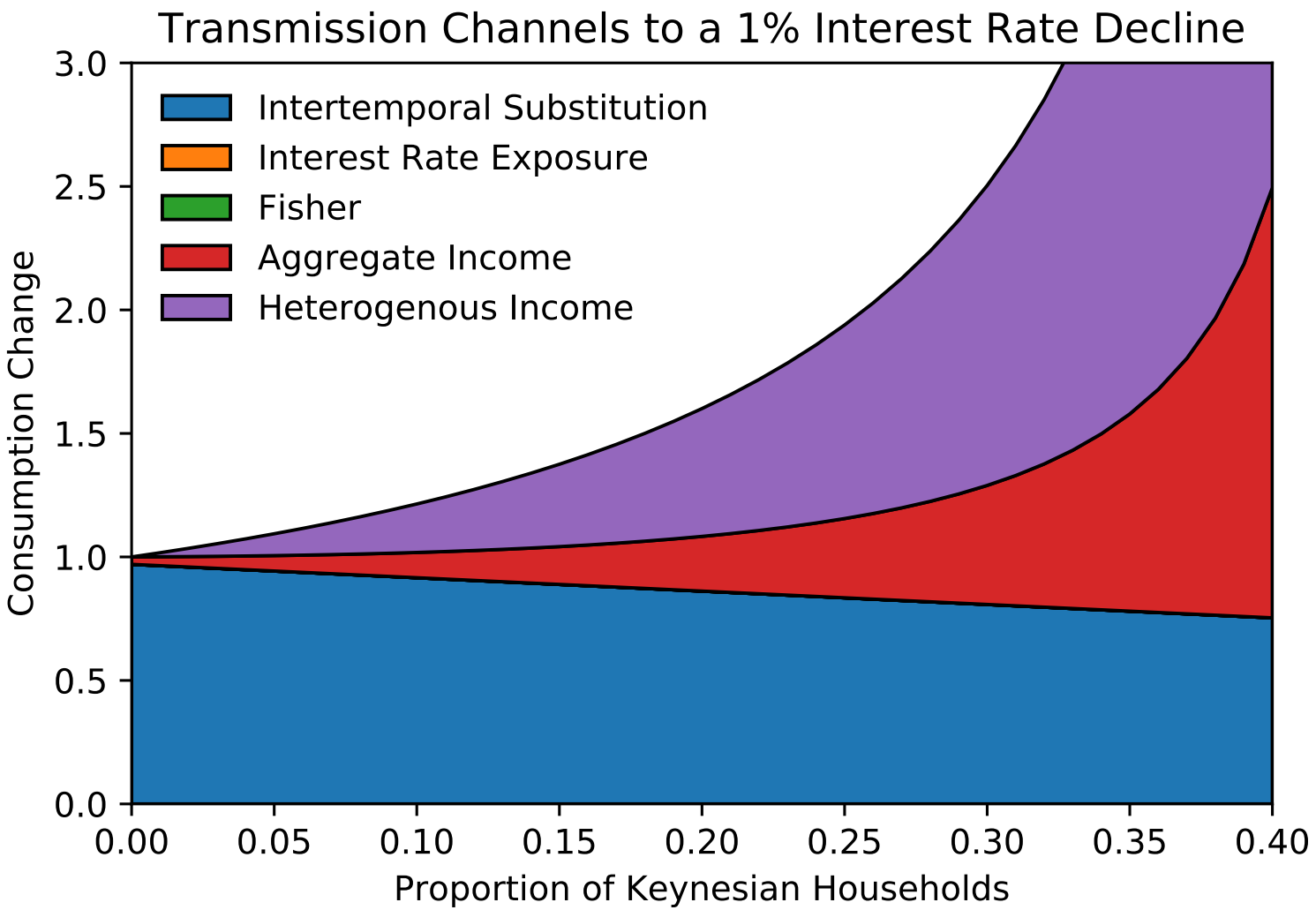
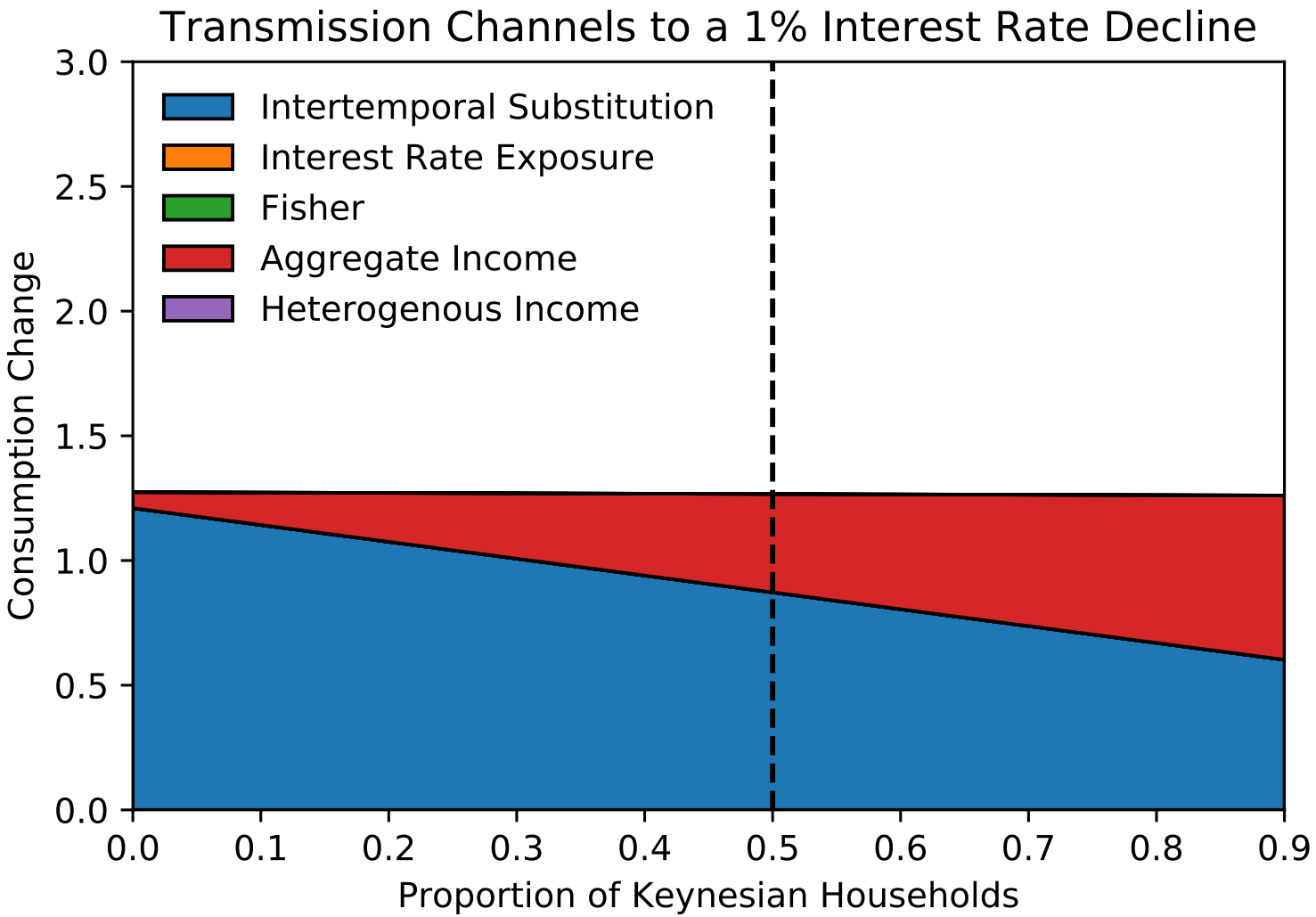
Two Agents: Ricardian and Keynesian
Fixed Capital (owned by Ricardian's)
Keynesians can borrow up to Ω of their steady state income as short term nominal bonds $\rightarrow$ Not a common feature of these models
Standard New Keynesian Phillips curve

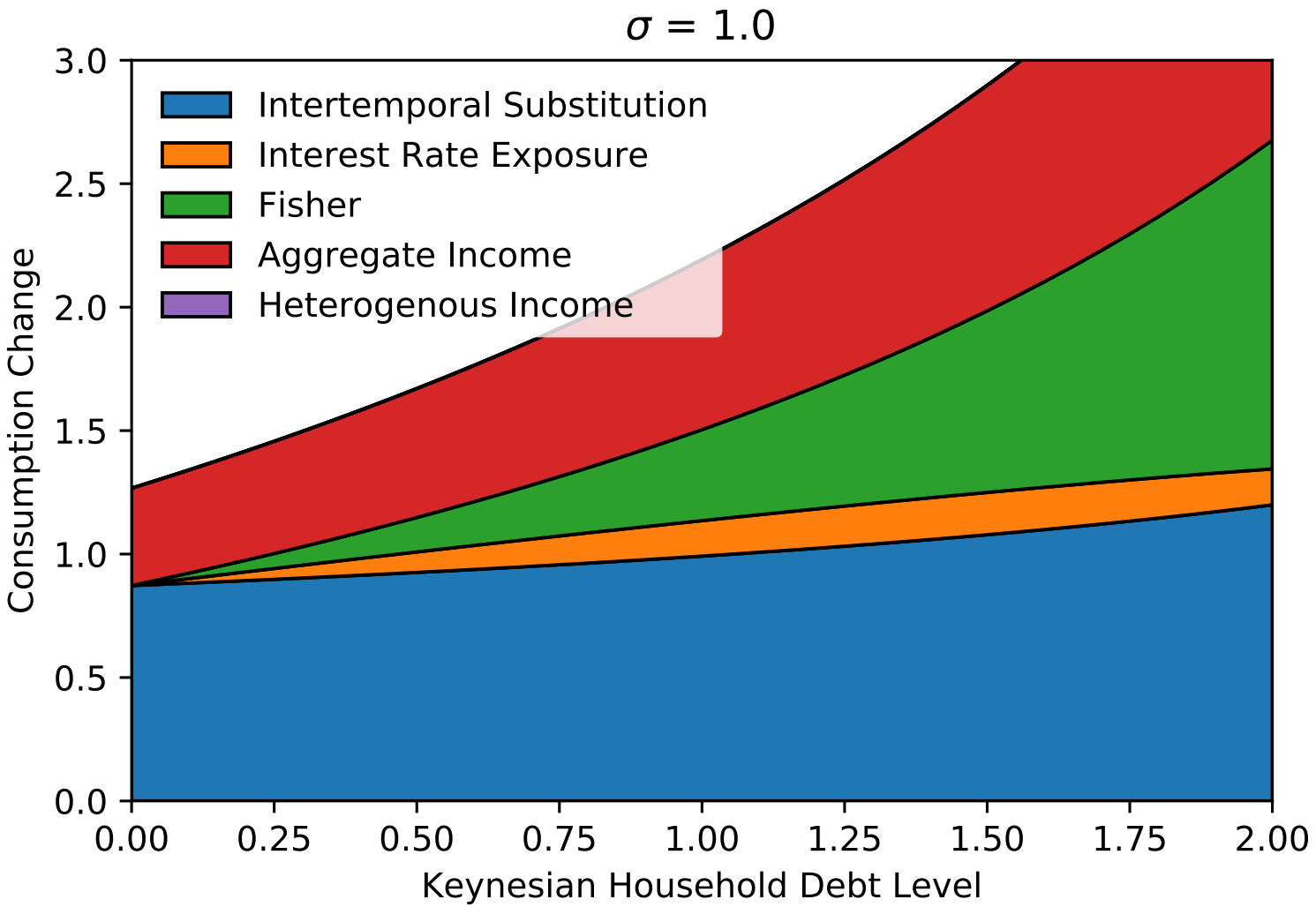
Model with no Debt ($\Omega = 0$) and Sticky Prices



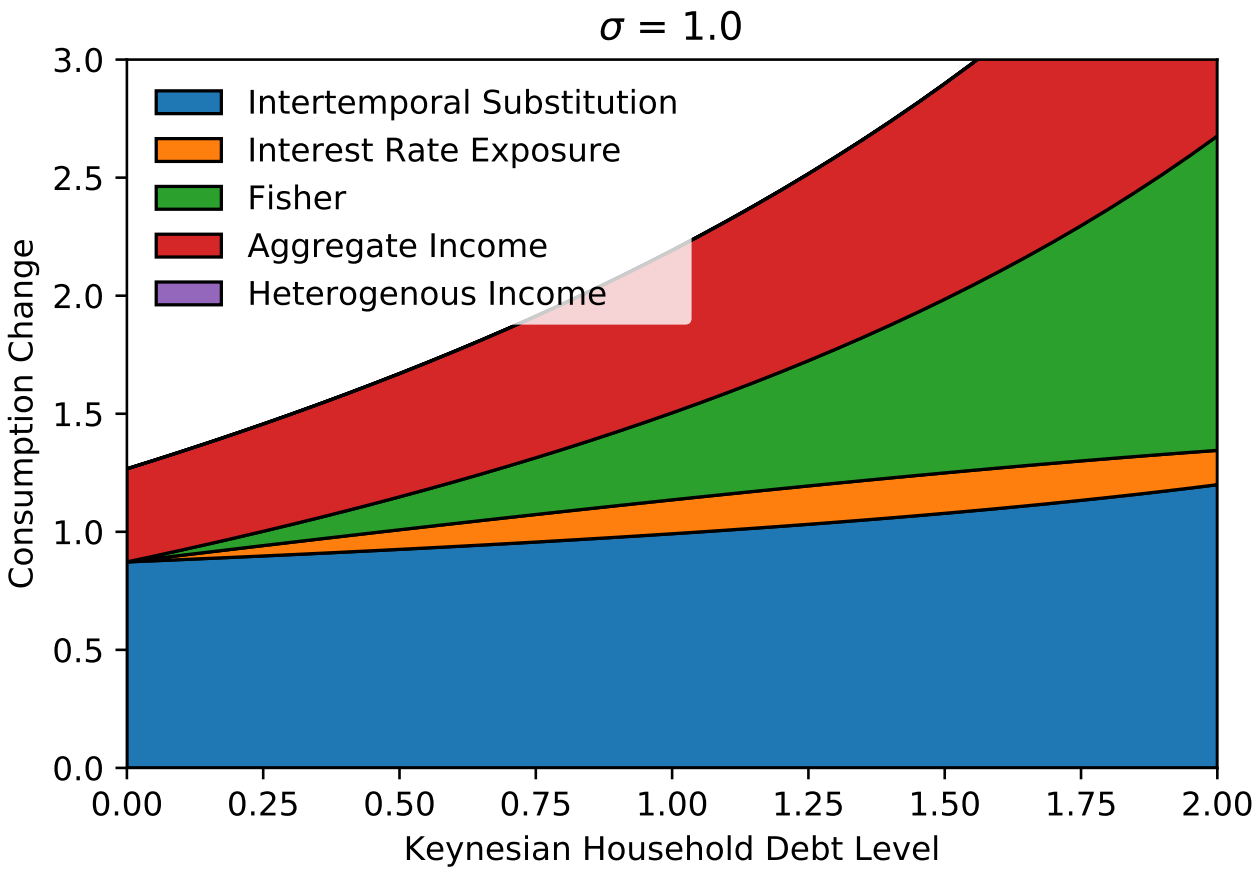
Model with no Debt ($\Omega = 0$) and Sticky Wages



Adding Debt


$\sigma = 1.0$
Intertemporal Substitution
Interest Rate Exposure
Fisher
Aggregate Income
Heterogenous Income
Consumption Change
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
Keynesian Household Debt Level

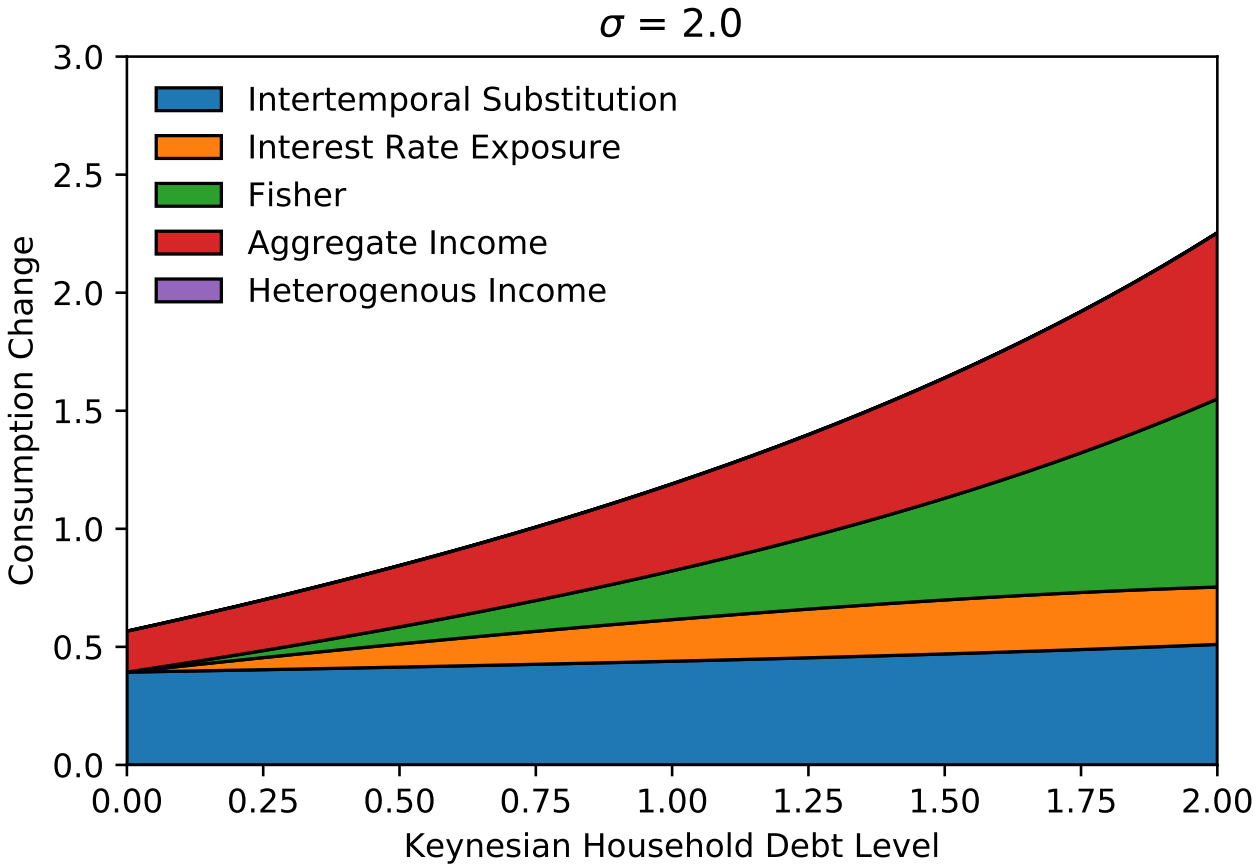
Elasticity of Intertemporal Subs.



Intertemporal Substitution and Interest Rate Exposure act as initial 'kick'

Fisher and Income channels amplify this

Elasticity of Intertemporal Subs.



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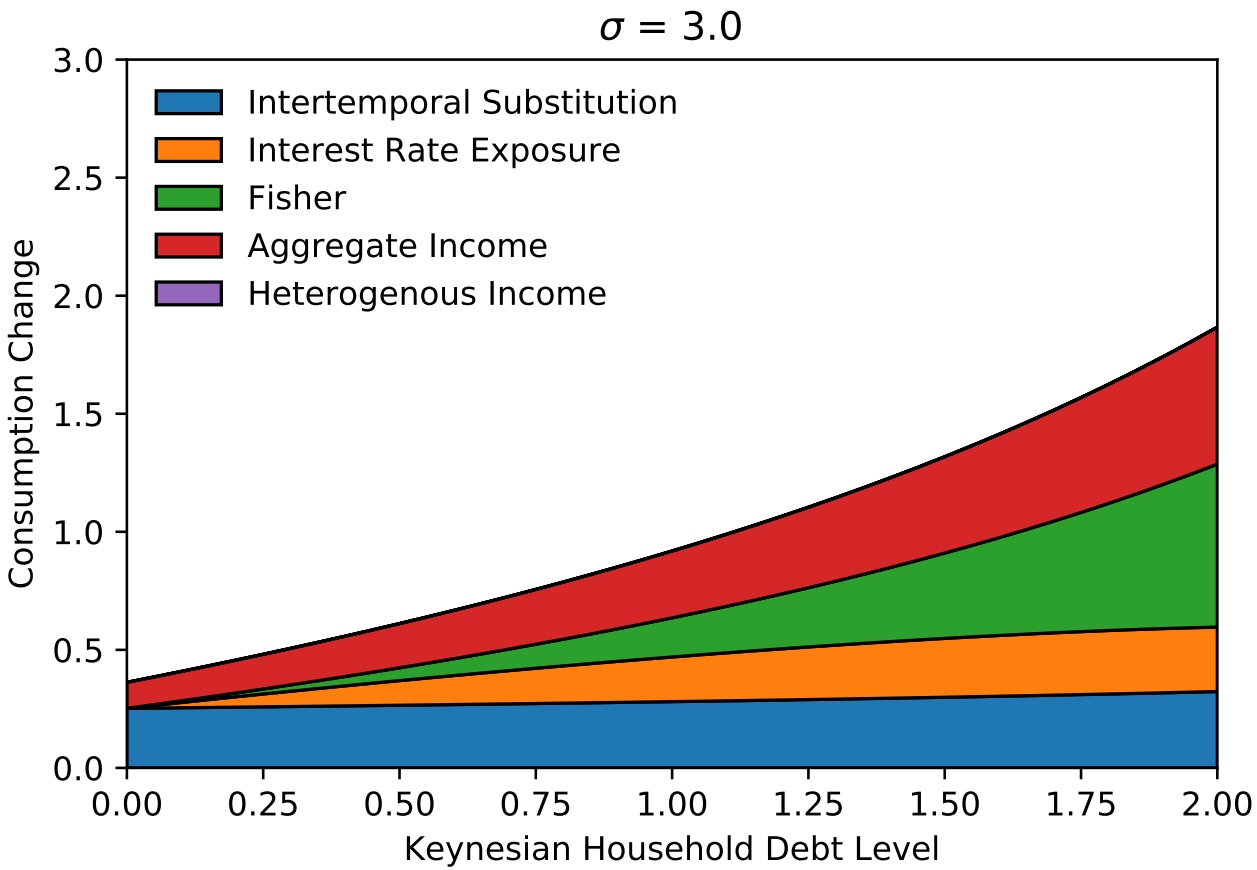

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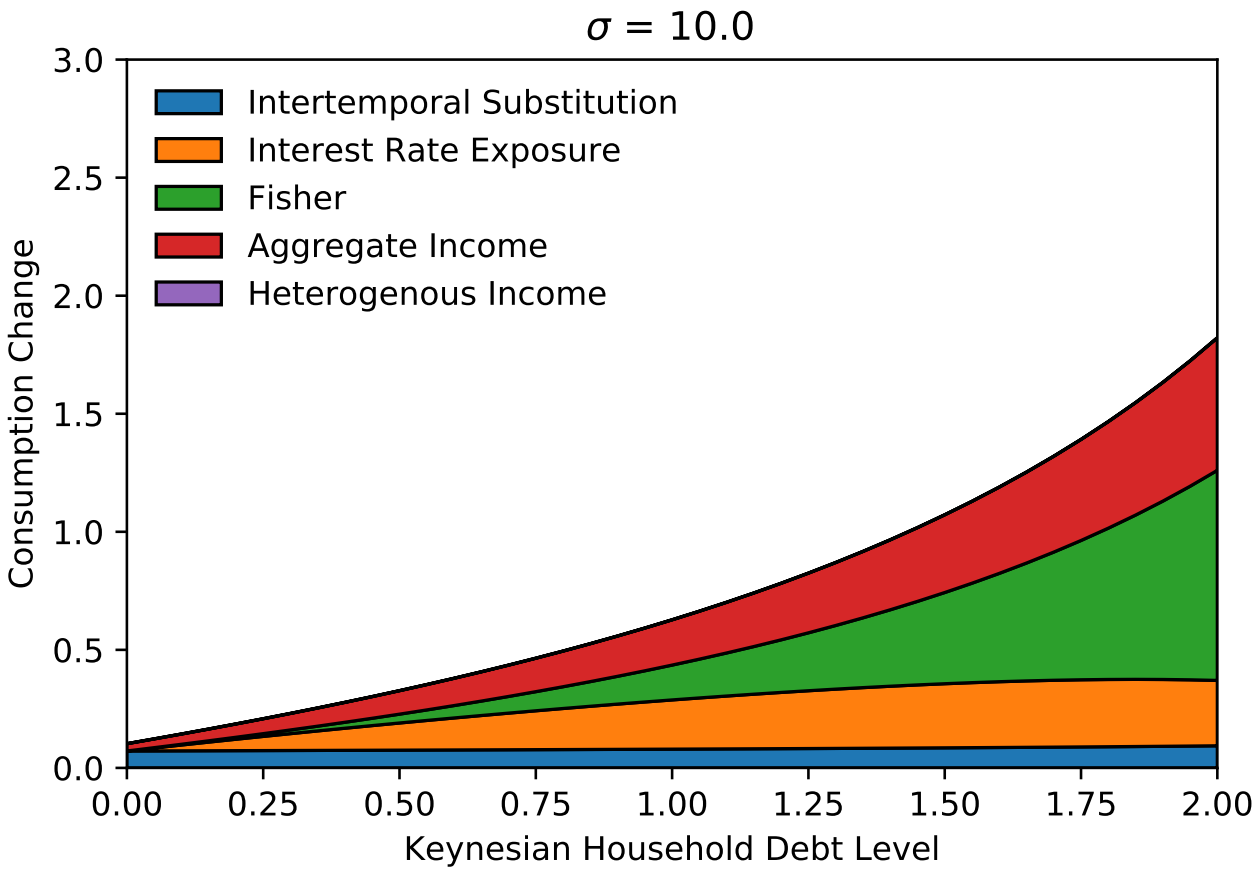

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Monetary Policy acts with "Long and Variable Lags"

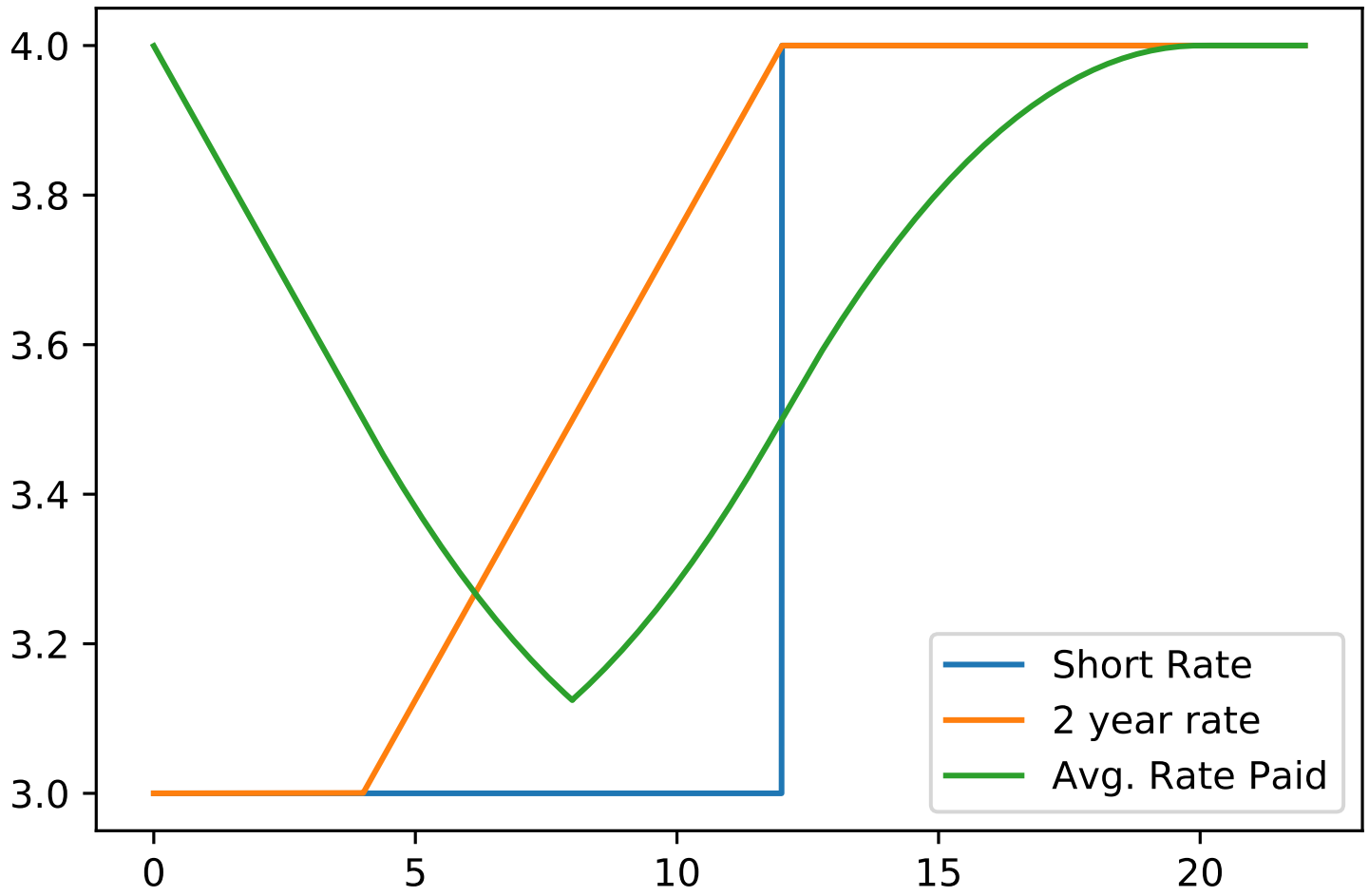
Intertemporal Subsitution doesn't give rise to a lag

- Habits - but no micro evidence
- Sticky Information

Interest Rate Exposure naturally acts wtih a lag

-

Delayed Interest Rate Exposure Response



Solving HANK Models is more involved

We need new solution methods

- Reiter (2009)
- Winberry (forthcoming QE)
- Ahn, Kaplan, Moll, Winberry, and Wolf (2017)
- Bayer and Luetticke (2018)

What do we gain?

- Uncertainty
- Matches micro behavior ???
- Kaplan, Moll and Violante claim transmission is very different to TANK

Greenwood, Hercowitz and Huffman Preferences

Many HANK models use GHH preferences

$$U(c, n) = u(c - \nu(n))$$

Removes wealth effects from labor decision

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Removes wealth effects from labor decision

BUT these preferences have a strong link between consumption and hours worked
Extra transmission channel:

$$\text{GHHchannel} = \mathbb{E}\left((1 - MPC_i)h_i\right)\frac{\bar{N}}{\psi}d\omega$$