The Market for Sharing Interest Rate Risk: Quantities and Asset Prices

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September, 2024

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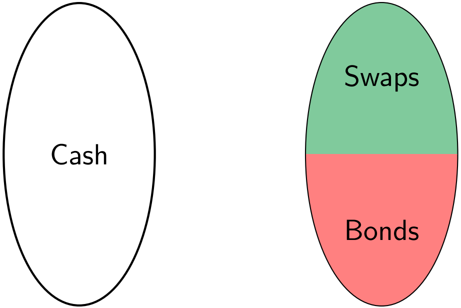
Market clearing $X_t(\tau) + Q_t(\tau) = 0$

Suggestion #1: Demand function of preferred-habitat investors

β_t



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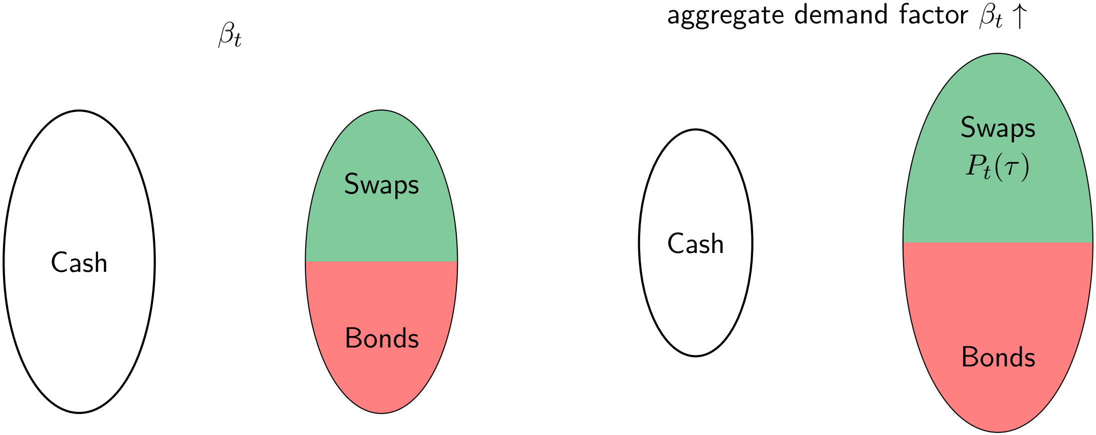

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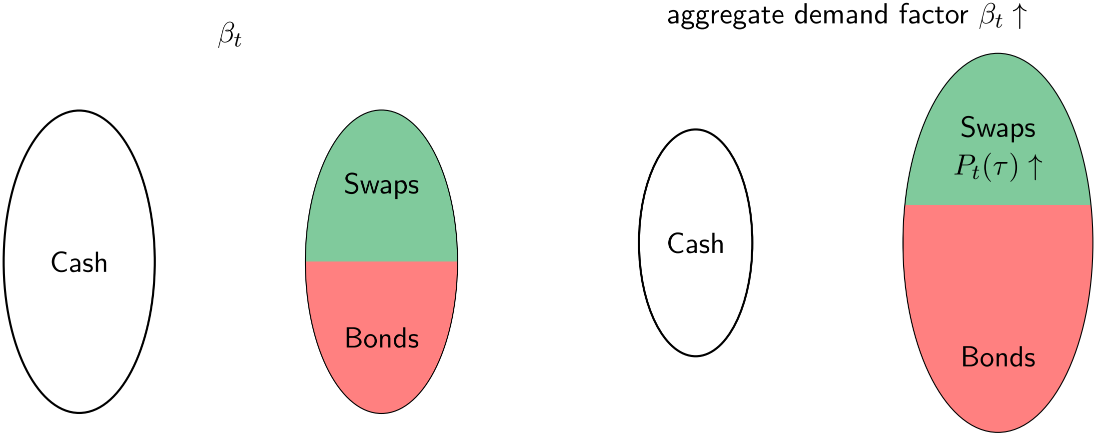

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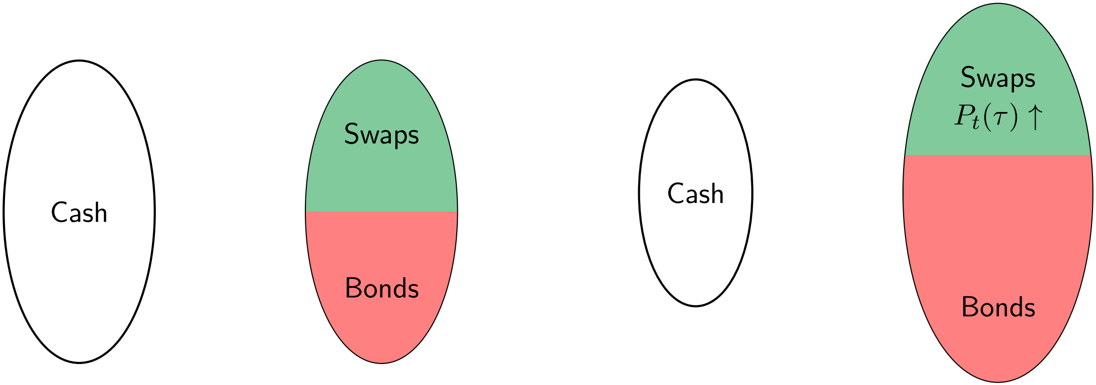
β_t aggregate demand factor $\beta_t \uparrow$



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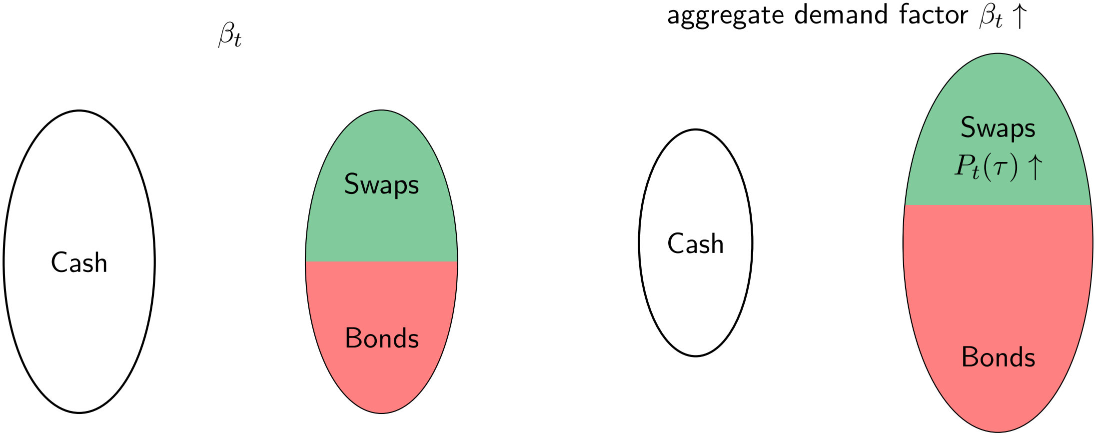

$$Q_t(\tau) = -\alpha(\tau) \log P_t(\tau) - \theta_0(\tau) - \sum_{k=1}^{K} \theta_k(\tau) \beta_{k,t}$$

$$\log Q_t(\tau) = -\alpha(\tau) \log P_t(\tau) - \theta_0(\tau) - \sum_{k=1}^{K} \theta_k(\tau) \beta_{k,t}$$

Suggestion #2: Arbitrageurs

Numéraire = bonds?

$$dW_t = \int_0^\infty X_t(\tau) \left(\frac{dP_t(\tau)}{P_t(\tau)} - c_t \right) d\tau$$

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Summary: Results

Calibration:

Direction	Short-to-intermediate group prefers to pay fixed (banks and corporates)
	Long maturity prefers to receive fixed (PF&I)
Elasticity	Inelastic demand
	elasticity(PF&I) $<$ elasticity(banks&corporates) $<$ elasticity(funds)

Counterfactuals:

Demand shock to one sector greatly affects swap prices and another sector's hedging cost

No arbitrage $\implies$ underestimation of demand elasticity

- Fuchs, Fukuda, and Neuhann (2024): No arbitrage $\implies$ prices co-move in substitutable assets $\implies$ less rebalancing $\implies$ underestimation of demand elasticity
- This paper: uses 'relative price' $P \equiv P^S/P^B$ to get around the issue
- 'Relative price' may have its own issues..
- Current discussion is probably insufficient:

risk (Klingler and Sundaresan, 2019). Since, in general, investors can also use bonds for hedging, the relevant price for their demand for swaps is the swap spread, which captures the price of a swap relative to the maturity-matched bond. Defining price this way also nets out the direct impact of bond yields on swap rates.

Suggestion 3: Explicitly model substitution

$$Q_t(\tau) = -\alpha(\tau)\log P_t^F(\tau) + \beta(\tau)\log P_t^B(\tau) - \theta_0(\tau) - \sum_{k=1}^{K}\theta_k(\tau)\beta_{k,t}$$

Current paper assumes $\alpha(\tau) = \beta(\tau)$

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$$dW_t = \int_0^\infty \left[X_t(\tau)\left(\frac{dP_t^F(\tau)}{P_t^F(\tau)} - c_t\right) + X_t^B(\tau)\left(\frac{dP_t^B(\tau)}{P_t^B(\tau)} - c_t^B\right)\right] d\tau$$

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$$X_t(\tau) + Q_t(\tau) = 0$$

$$X_t^B(\tau) + Q_t^B(\tau) = 0$$

Summary

Rich results!

Main suggestions:

- Sharpen the interpretation of 'relative price'
- Explicitly model substitution with bonds