On the Macroeconomics of Risk Intolerance
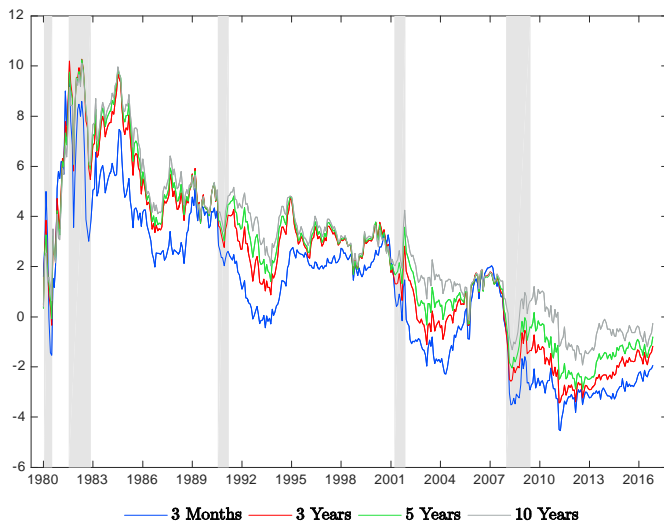
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MIT and NBER

BIS, Summer 2017

Background papers

1. Caballero, R.J., E. Farhi, and P.O. Gourinchas, "Rents, Technical Change, and Risk Premia. Accounting for Secular Trends in Interest Rates, Returns on Capital, Earning Yields, and Factor Shares," in *American Economic Review, Papers and Proceedings*, 2017, 107(5): 614-620

2. Caballero, R.J., E. Farhi, and P.O. Gourinchas, "The Safe Asset Shortage Conundrum," forthcoming in *Journal of Economic Perspectives*, Vol 31(3), Summer 2017

3. Caballero, R.J., and A. Simsek, "A Risk-centric Model of Demand Recessions and Macroprudential Regulation," MIT Mimeo, May 2017
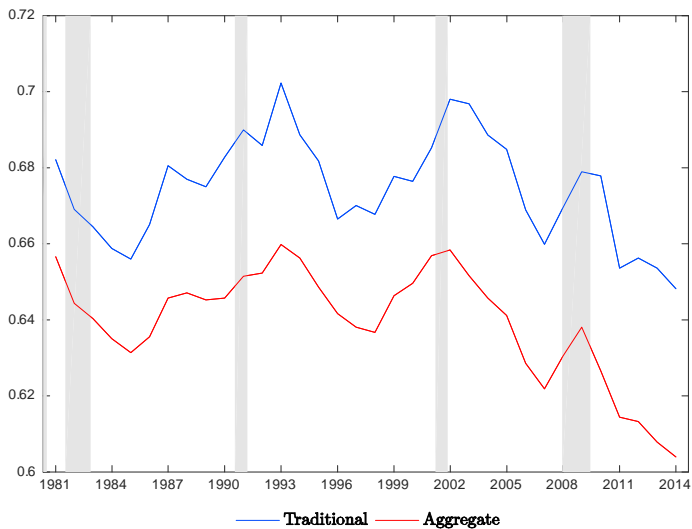
# Real (Riskfree) Interest Rates (U.S.)

Real Return on Capital (U.S.)

Legend: — Business Capital — All Capital
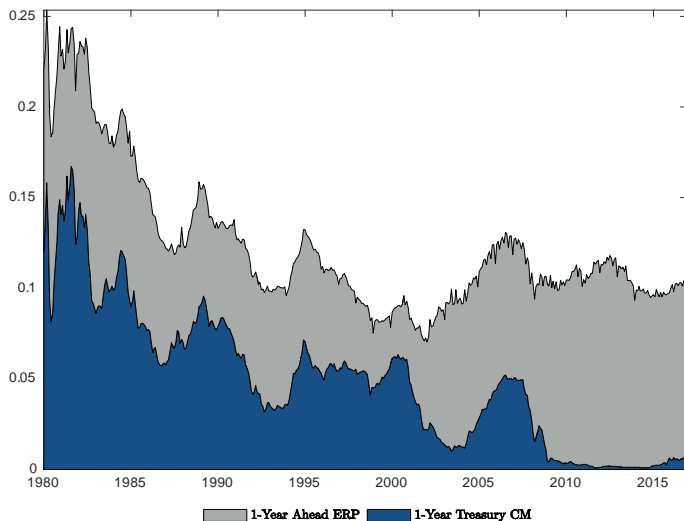
Traditional — Aggregate
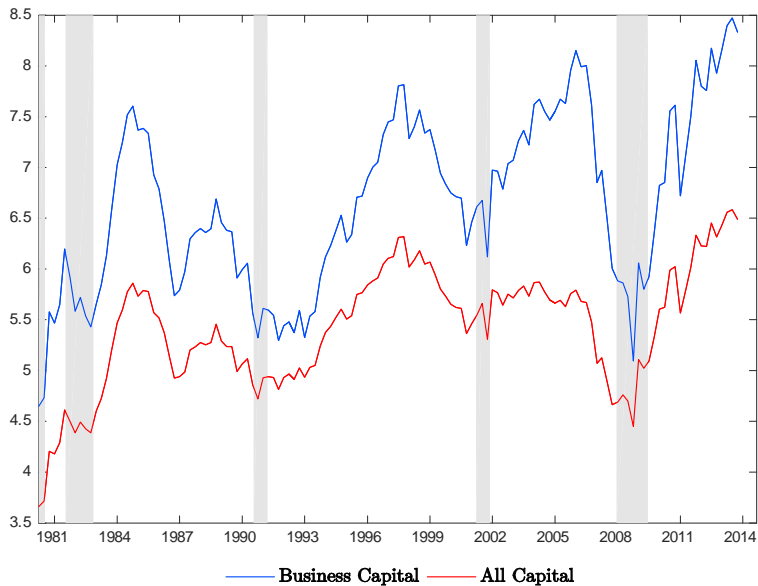
Risk Intolerance

	Series	Variable	Sample		
			$1980 - 1999$	$2000 - 2007$	$2008 - 2015$
Data		APK^e (%)	6.33	7.13	7.35
		s_N	0.645	0.642	0.617
		r^s (%)	3.11	0.29	-2.85
		ζ	0.86	0.70	0.68
		$Y/(\zeta K)$	0.38	0.40	0.38
		EY (%)	6.89	4.33	5.34
		g^e (%)	2.52	3.21	2.56
$\sigma = 1$	(a)	μ	1.017	1.023	1.064
		KRP (%)	1.28	4.65	6.63
	(b2)	α_K	0.355	0.358	0.383
	(b)	KRP (%)	1.94	5.56	8.93
	(EY)	KRP (%)	2.08	3.24	4.87

- Note: unlevered premium

Earnings Yield (S&P 500)
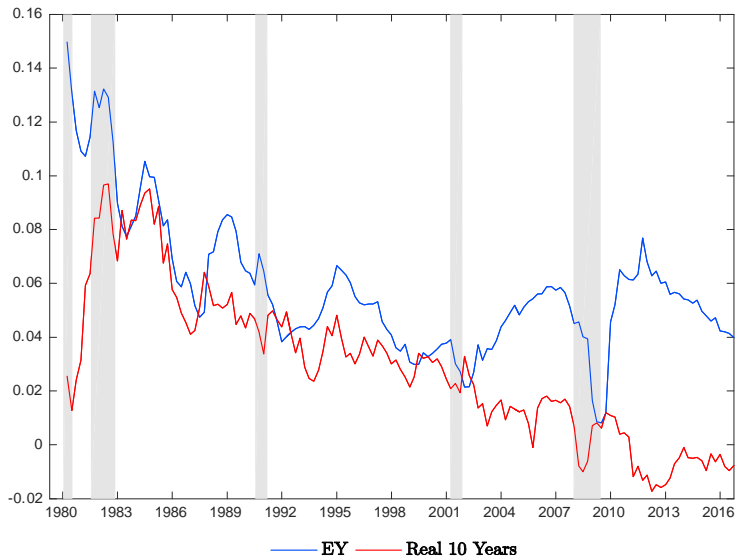
Equity Risk Premium (U.S.)

Equity Risk Premium (Global)

Risk Intolerance

Sharpe Ratio - RA (12 months)
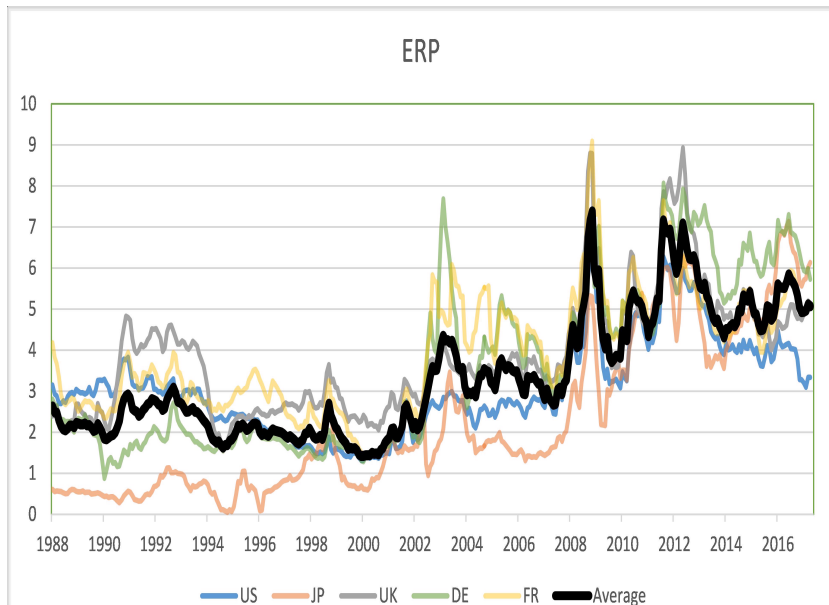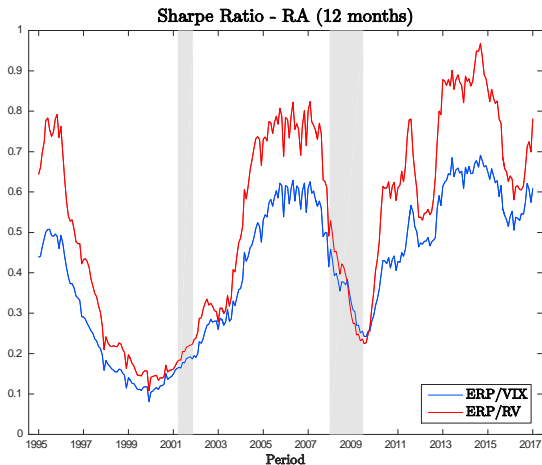
- *Important caveat:* Evidence of reach-for-yield within asset classes (heterogeneity)

The Safe Assets Shortage Perspective

- Steady increase in demand for store of value and "safe" assets
  - Demographics, international reserves accumulation, regulation...

- What is a safe asset?
  - Depends on time and context: Individual and collective fears and concerns, on coordination and liquidity, and so on...
  - Operational definition: A simple debt instrument that is expected to preserve its value during adverse systemic events

- The supply of these assets is not keeping up with demand
  - The financial system reacted to that gap (financially engineered) and masked the underlying trend for a while, but it didn't end up well (micro vs macro safe assets)
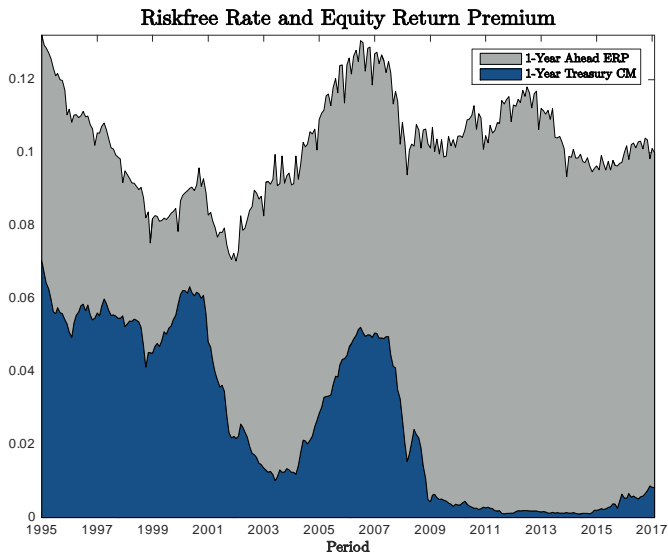
The Safe Assets Shortage Perspective

A List of Safe Assets—Pre- and Post-Crisis

	Billions of US$		% of world GDP	
	2007	2011	2007	2011
US Federal government debt held by the public	5,136	10,692	9.2	15.8
Held by the Federal Reserve	736	1,700	1.3	2.5
Held by private investors	4,401	8,992	7.9	13.3
GSE obligations	2,910	~~2,023~~	5.2	~~3.0~~
Agency-and GSE-backed mortgage pools	4,464	~~6,283~~	8.0	~~9.3~~
Private-issue ABS	3,901	~~1,277~~	7.0	~~1.9~~
German and French government debt	2,492	3,270	4.5	4.8
Italian and Spanish government data	2,380	~~3,143~~	4.3	~~4.7~~
Safe assets	20,548	12,262	36.9	18.1

Source: Barclays Capital (2012). Data came from Federal Reserve Flow of Funds, Haver Analytics, and Barclays Capital.
Note: Numbers are struck through if they are believed to have lost their "safe haven" status after 2007. GSE means "government-sponsored enterprise." ABS means "asset-backed security."

The Safe Assets Shortage Perspective

Riskfree Rate and Equity Return Premium

Legend:
- 1-Year Ahead ERP
- 1-Year Treasury CM

Consequences

- Early phases: Mostly "benign"
  - Overtly benign: Lower cost of capital
  - Overtly concerning: Global imbalances and the Greenspan conundrum
  - Covertly dangerous: Financial engineering to manufacture safe tranches from subprime inputs (... and partially held by levered institutions)

- Post 2008: The Safety Trap
  - With downward rigidities in rates adjustment (ZLB, reversal rate, etc.), goods markets takes the hit
  - A stubborn form of liquidity trap, less responsive to standard (generic) wealth boosting macro policies

The Medium Term

- Obviously there are cycles, waves of euphoria won't go away, and so on.... but the secular forces seem robust
- Moreover, this is a *global,* not a U.S. phenomenon
  - A country with an acute shortage of safe assets spreads its downward pressure on rates all around
    - Incentives aside, this is mostly good news for the recipient country if interest rates are flexible
    - Not so, if against "ZLB"
- We may well be in a recurrent *global* safety traps environment

Scape Valves

- The main market mechanism to restore equilibrium in a safety trap is an increase in the *valuation* of safe assets
    - Interest rate drop is the first response, but not much space there
    - Next is an *appreciation of the currency* in which these assets are denominated, primarily USD — *paradox of the reserve currency*

- Issuance of *public debt*
    - If asset producer economies grow less than asset demander economies, we get a modern "Trifflin dilemma"
        - Risk of fiscal fragility. In this environment the main concern is the appearance of credible substitutes (not too worrisome for the U.S.... at the moment)
    - The value of the new safe debt created is distinct from the use of these funds (cheaply funded fiscal expansion). QE swapping risky for safe assets does it too (while Operation Twist doesn't)
    - Public good dimension of safe asset issuance

Scape Valves

- Private substitutes.
  - Endogenous risk reduction via technology/sector selection and liability management
  - Financial system (to the extent that it doesn't consume too many safe assets in the process). Needs public insurance overlay (micro vs macro insurance)

- Reducing the (net) demand for safe assets
  - International reserves
    - EM: Self-insurance. Partially replace with multilateral insurance arrangements
    - DM: QE makes sense when absorbing risk, otherwise it can be counterproductive
    - Regulatory framework

- A productive capacity (and its expansion) generates output and risks, **both** of which need to be absorbed by economic agents
- In principle, we could have output- and **risk**-gaps
- In most **macro** (unlike finance) modeling the emphasis is on the former
  - Often the risk side is ignored (log-linearizations)
  - Or it remains in the background (discount factor)
- **Main "big picture" goal of paper with Alp Simsek:** To provide a macro model to study both gaps jointly, but inverting the hierarchy

What do we do?

- AD/AS:
  - Aggregate supply (potential output): Stochastic endogenous growth model with investment costs and (implicit) NK-structure
  - **Aggregate demand:** It may become an additional constraint to producers
  - Interest rate has **downward rigidity** (ZLB or others)
- Two shocks: productivity (diffusion) and **ERP** (Poisson)
- Heterogenous beliefs (about ERP shocks) and **speculation**
- Policy: r-policy, FG, macroprudential

What do we find?

- **Cyclical:**
  - In the absence of r-friction: Productivity shocks only affect growth, while ERP shocks are absorbed one-for-one by $r-$adjustment
  - **With r ZLB:**
    - when (implied) vol spikes, asset prices drop to restore equilibrium in risk markets, and drag down aggregate demand,...which drags down asset prices, and so on
    - optimism (about exit from high vol state) is key to limit the fall in AD
    - with heterogeneous beliefs, share of wealth owned by optimists is a key state variable
    - speculation is destabilizing (economy is effectively extrapolative)
    - volatility rises endogenously and feeds back into asset prices and aggregate demand

- **Policy:**

  - Interest rate policy is highly effective while it lasts

    - it controls the *Sharpe ratio*, leaving asset prices to equilibrate the goods market

  - Forward Guidance is also effective, but its robustness to deviations from "RE" drops with pessimism

  - Macroprudential policy makes everyone better off (evaluated under their own beliefs, or belief-neutral criterion)

    - Goal is to provide additional insurance to high valuation investors to internalize aggregate demand externalities
    - It is naturally procyclical as the negative effect on AD can be offset with r-policy during the boom but not during deep recessions

  - Volatility stabilization measures are also powerful

The Basic Mechanism

- **Goods Markets Eq**

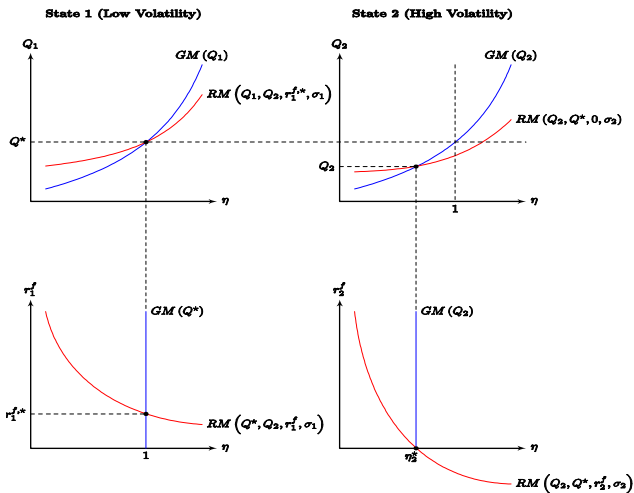$$(Ak)\,\eta = \rho Q k + \iota(Q)k$$

- **Monetary Policy**

$$Q \leq Q^*, r_{t,s}^f \geq 0, \text{ with complementary slackness}$$

- **Risk Markets Eq.**

$$\sigma_s = \frac{\rho + g(Q_s) + \lambda_s \left(1 - \frac{Q_s}{Q^*}\right) - r_s^f}{\sigma_s}$$

- Speculation leads to sharper drops in RM; Interest rate policy, FG, macropru

Final Remarks

- The world economy experienced a prolong period of "risk-intolerance," which is likely to remain around the (macroeconomic) corner
- Risk-intolerance has strained the safe-assets markets.
  - The natural market solutions to the problem are not encouraging (appreciations, financial instability,...)
  - There is a need for policy support in the creation and use of safe assets

Final Remarks

- High frequency macroeconomics is also affected by this environment
  - Strong feedbacks between risk-markets, volatility, and the output-gap
- The key tension is that asset prices have the dual role of equilibrating financial markets and supporting aggregate demand
  - Interest rate policy works by taking over the role of equilibrating financial markets, which then leaves asset prices free to balance the goods markets
  - At the ZLB the dual role problem reemerges and asset prices are driven primarily by financial markets considerations...
    - triggering a perverse feedback between asset prices and AD
    - which can only be stopped by hope (optimism about recovery)
  - (Procyclical) Macroprudential regulation reduces the gap between the asset prices that equilibrate the financial and goods markets at the ZLB... by keeping high valuation investors well capitalized