

Economics 435
The Financial System
(10/12/2015)

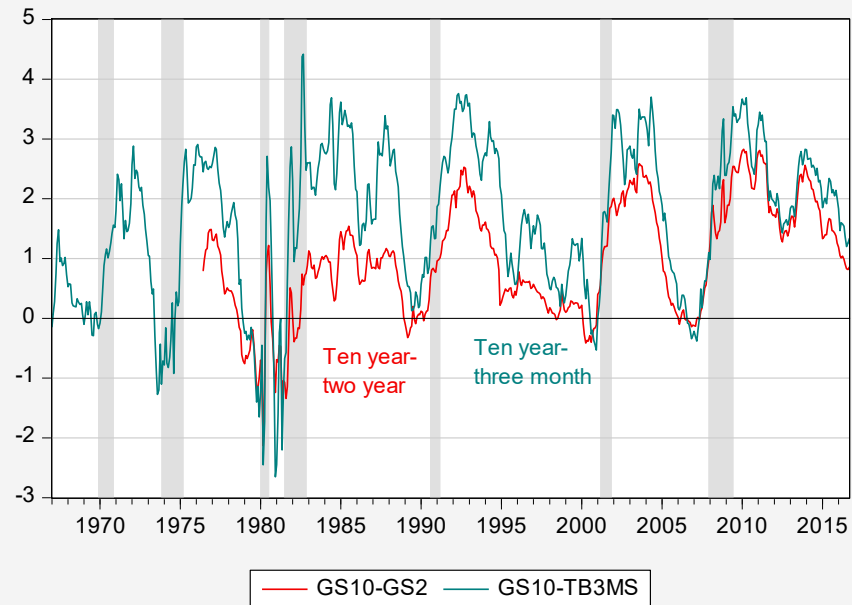
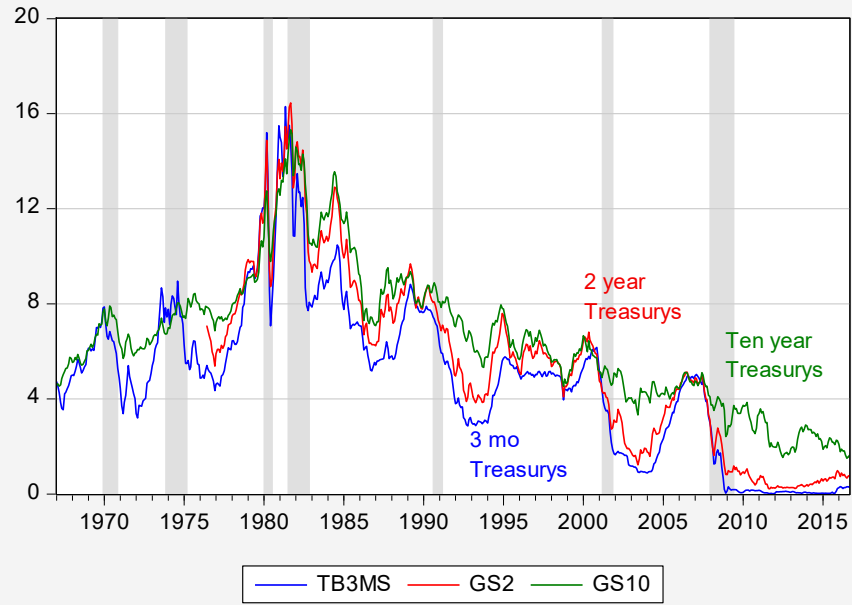
Instructor: Prof. Menzie Chinn
UW Madison
Fall 2016

Outline

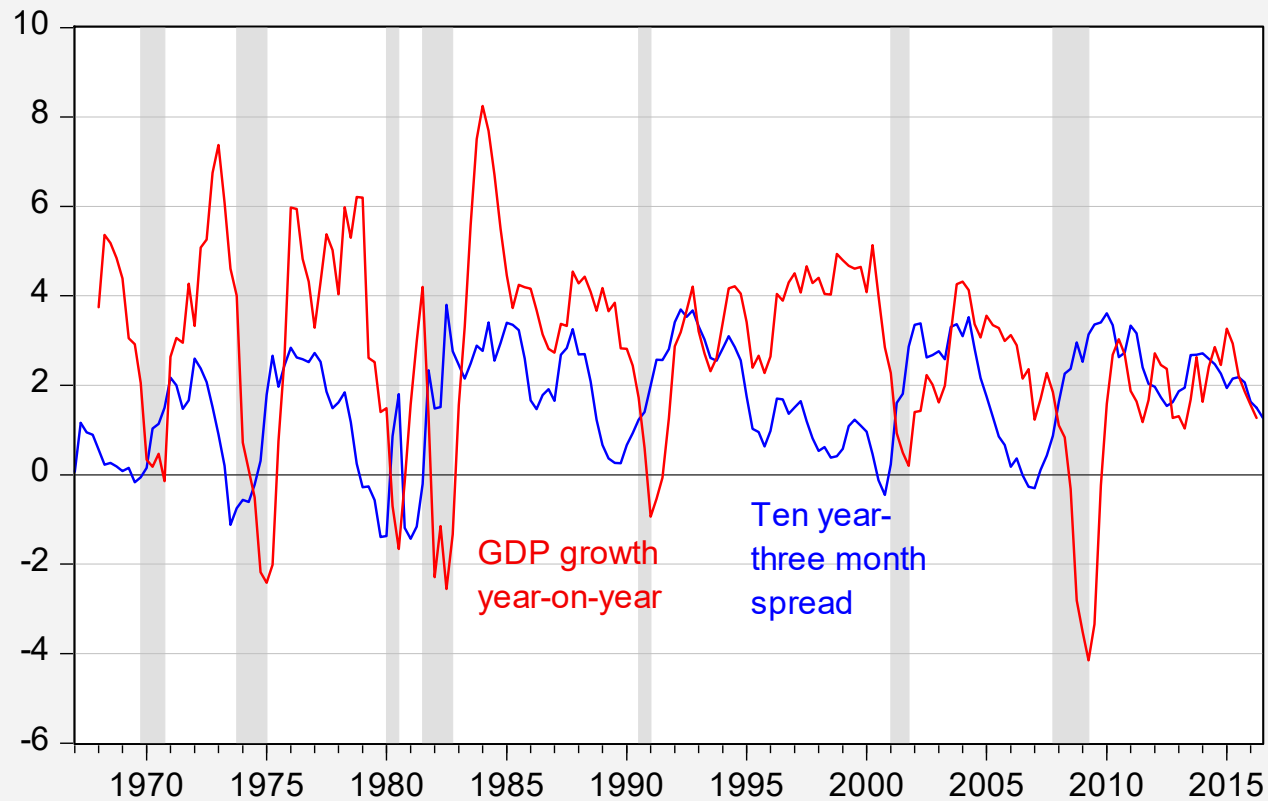
- The Term Structure
- The Term Structure and Predictive Power
- Credit Spreads and Ratings Agencies

Term Structure of Interest Rates

- Why do bonds with the same default rate and tax status but different maturity dates have different yields?
 - Long-term bonds are like a composite of a series of short-term bonds.
 - Their yield depends on what people expect to happen in the future.
- How do we think about *future interest rates*?



Term Spread and GDP Growth



— GS10-TB3MS — $D(\text{LOG}(\text{GDP09}),0,4)*100$

Ratings & the Risk Structure of Interest Rates

- Default is one of the most important risks a bondholder faces.
- In fact, independent companies (rating agencies) have arisen to evaluate the creditworthiness of potential borrowers.
 - These companies estimate the likelihood that the corporate or government borrower will make a bond's promised payments.
 - The government has acknowledged a few firms as “nationally recognized statistical rating organizations” (NRSROs).
 - Moody's, Standard & Poors, Fitch

Bond Ratings

- Firms or governments with an exceptionally strong financial position carry AAA or Aaa.
 - Ex: U.S. Government, ExxonMobil, Microsoft
- The top four categories are considered **investment-grade bonds**.
 - These bonds have a very low risk of default.
 - Reserved for most government issuers and corporations that are among the most financially sound.
- Contrast with **non-investment-grade or speculative/highly speculative grade bonds**.
 - regulated institutional investors can't hold these.

	Moody's	Standard & Poor's	Description	Examples of Issuers with Bonds Outstanding in 2009
Investment Grade	Aaa	AAA	Bonds of the best quality with the smallest risk of default. Issuers are exceptionally stable and dependable.	U.S. government ExxonMobil Microsoft
	Aa	AA	Highest quality with slightly higher degree of long-term risk.	General Electric Procter and Gamble Spain
	A	A	High-medium quality, with many strong attributes but somewhat vulnerable to changing economic conditions.	Bank of America Oracle China Italy
	Baa	BBB	Medium quality, currently adequate but perhaps unreliable over the long term.	General Mills Time Warner Russia
Noninvestment, Speculative Grade	Ba	BB	Some speculative element, with moderate security but not well safeguarded.	Goodyear Tire Sears Turkey
	B	B	Able to pay now but at risk of default in the future.	Ford Motor Hertz Argentina
Highly Speculative	Caa	CCC	Poor quality, clear danger of default.	Beazer Homes USA Ukraine
	Ca	CC	Highly speculative quality, often in default.	Ambac
	C	C	Lowest-rated, poor prospects of repayment though may still be paying.	
	D	D	In default.	Champion Enterprises CIT Group



LESSONS FROM THE CRISIS RATING AGENCIES

- What caused the ratings errors?
 - Data didn't have sufficient information.
 - Firms hire the agencies to consult on what types of MBS have the highest ratings and then rate them, which was a conflict of interest.
 - Ratings agencies are compensated by the issuers of the bonds.
 - Agencies used a single rating scale to represent default probabilities, independent of other characteristics like liquidity.
 - This may have led investors to underestimate other important risks.

Commercial Paper

- **Commercial paper** is a short-term version of a bond.
 - The borrower offers no collateral so the debt is *unsecured*.
 - Commercial paper is
 - Issued on a discount basis, as a zero-coupon bond specifying a single future payment with no associated coupon payments.
 - Has maturity of less than 270 days, usu. 5-45 days.
 - Rated P-1, P-2 at issue, or speculative after downgrades
 - More than 1/3 is held by money-market mutual funds.

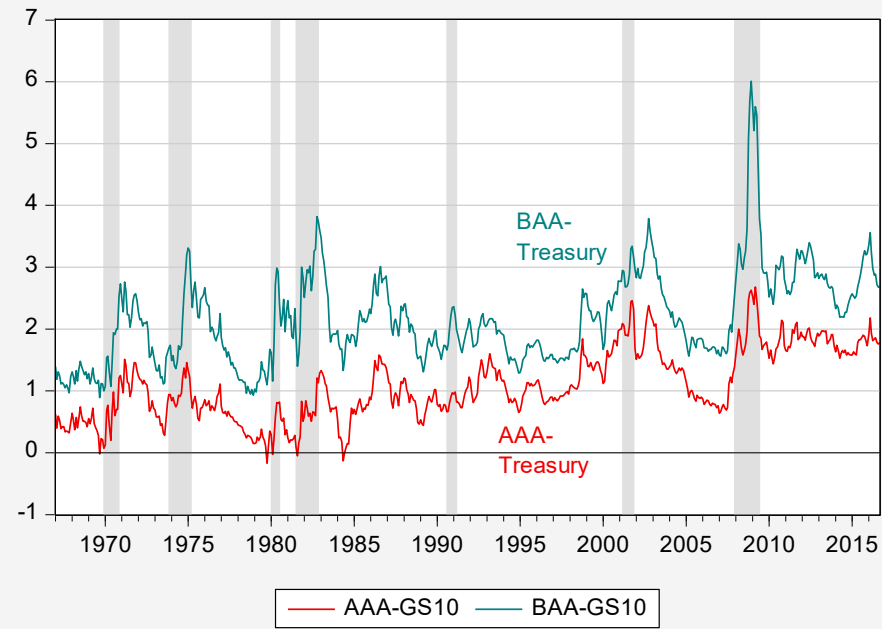
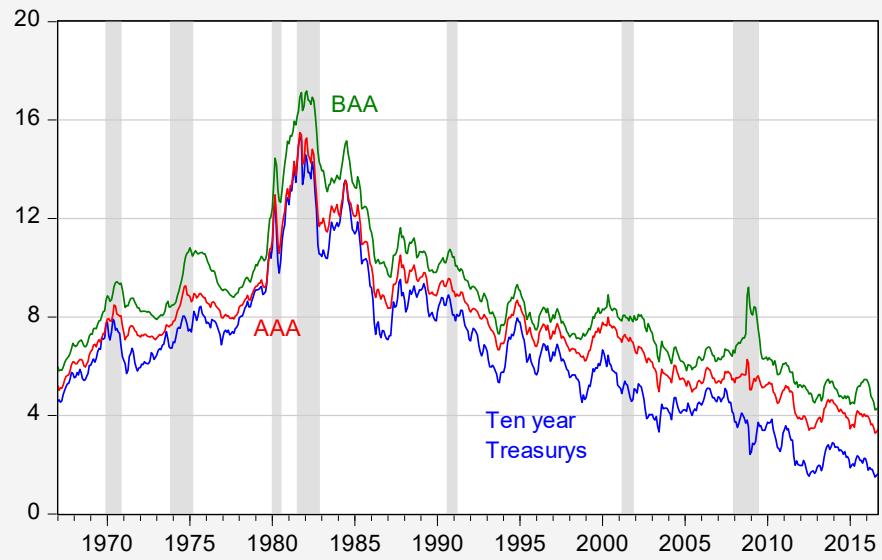
Commercial Paper

- Most commercial paper is issued with a maturity of 5 to 45 days and is used exclusively for short-term financing.
- The rating agencies rate the creditworthiness of commercial paper issuers in the same way they do bond issuers.
- Almost all carry Moody's P-1 or P-2 rating
 - P stands for prime grade commercial paper.
 - Speculative-grade commercial paper does exist, but not because it was issued as such.

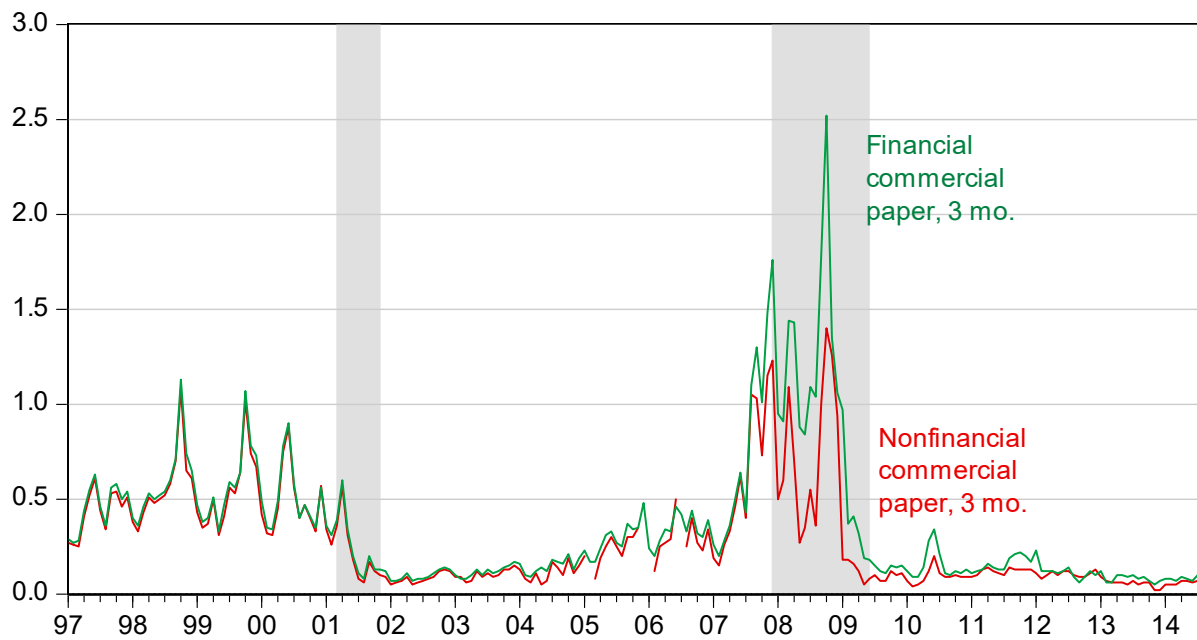
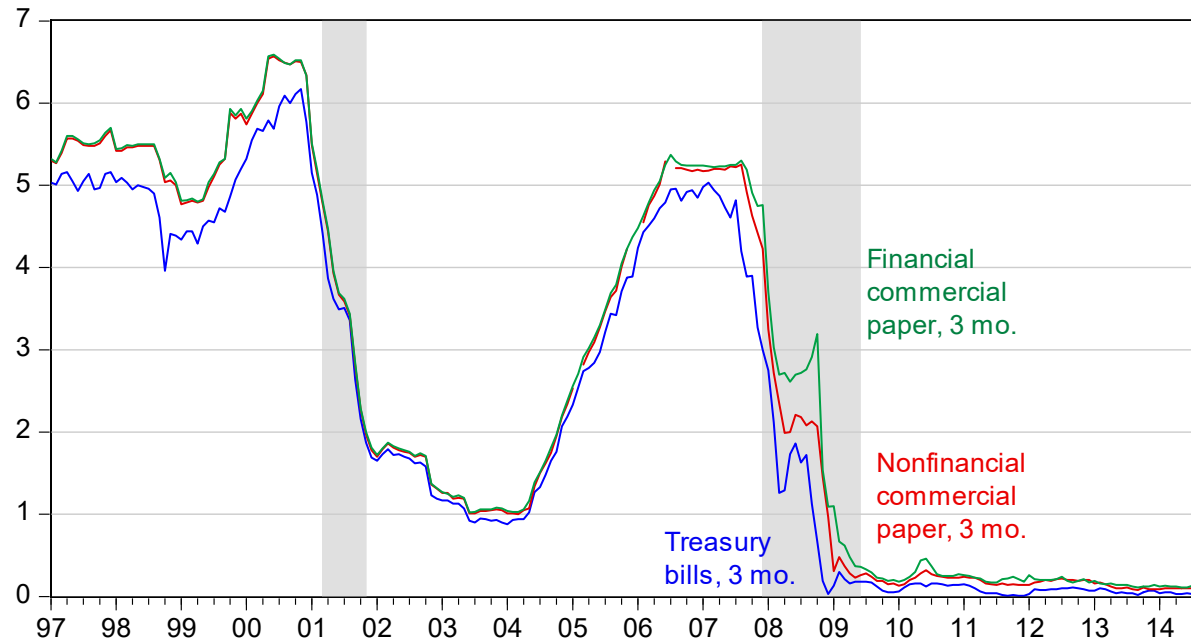
Commercial Paper

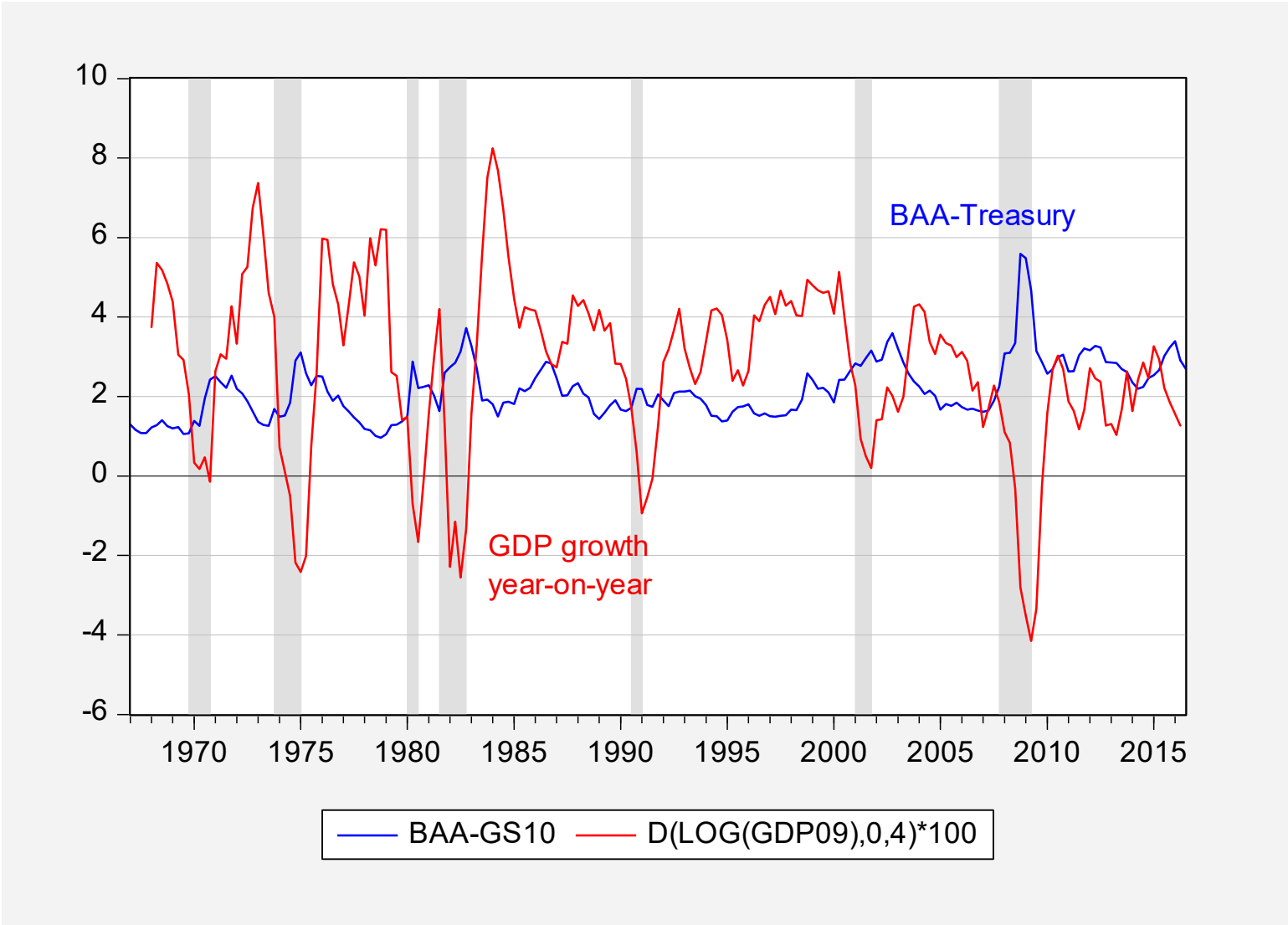
Table 7.2 Commercial Paper Ratings

	Moody's	Standard & Poor's	Description	Examples of Issuers with Commercial Paper Outstanding in 2009
Investment or Prime Grade	P-1	A-1+, A-1	Strong likelihood of timely repayment.	Coca-Cola Procter & Gamble China
	P-2	A-2	Satisfactory degree of safety for timely repayment.	General Mills Time Warner Malaysia
	P-3	A-3	Adequate degree of safety for timely repayment.	Alcoa Cardinal Health, Inc. India
Speculative, below Prime Grade		B, C	Capacity for repayment is small relative to higher-rated issuers.	Sears GMAC Turkey
Defaulted		D		Lehman Brothers



— AAA-GS10 — BAA-GS10





The Impact of Ratings on Yields

- Changes in the U.S. Treasury yields account for most of the movement in the Aaa and Baa bond yields.
- From 1979-2009, the 10-year U.S. Treasury bond yield has averaged almost a full percentage point below the average yield on Aaa bonds and two percentage points below the average yield on Baa bonds.

Combining Term Credit Spreads

Giovanni Favara, Simon Gilchrist, Kurt F. Lewis, and Egon Zakrajšek

- Use corporate bond credit spread adjusted for maturity.
- Strip out investor attitude to risk, retain default risk.
- Run probit regression:

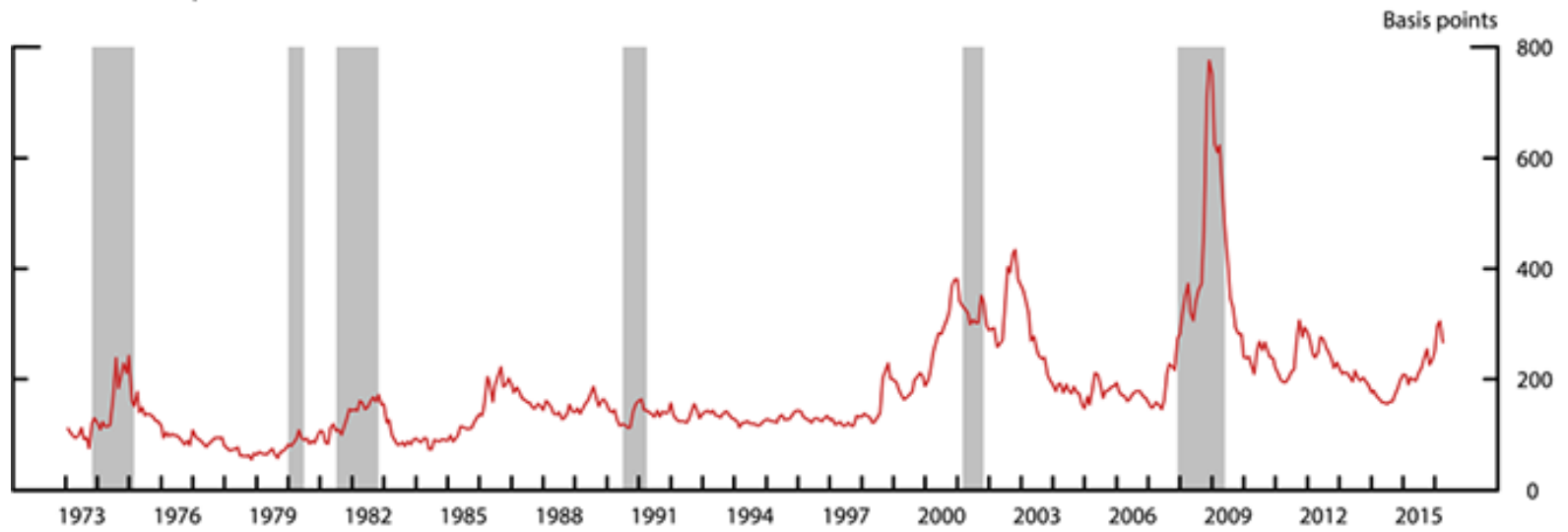
$$P(\text{NBERT}_{t,t+12}=1)=\Phi(\alpha+\beta_1\text{SGZ}_t+\gamma_1\text{TSt}+\gamma_2\text{RFF}_t)$$

$$P(\text{NBERT}_{t,t+12}=1)=\Phi(\alpha+\beta_1\text{S}^{\wedge}\text{GZ}_t+\beta_2\text{EBP}_t+\gamma_1\text{TSt}+\gamma_2\text{RFF}_t).$$

Probit Regression Results

Explanatory Variables	(1)	(2)	(3)
GZ credit spread (SGZt)	0.140***	.	.
	(0.037)		
Term spread (TSt)	-0.079**	-0.092***	.
	(0.034)	(0.029)	
Real federal funds rate (RFFt)	0.047**	0.017	
	(0.021)	(0.016)	
Predicted GZ credit spread (S^GZt)	.	-0.018	.
		(0.057)	
Excess bond premium (EBPt)	.	0.300***	0.327***
		(0.055)	(0.075)
Pseudo R^2	0.426	0.527	0.288

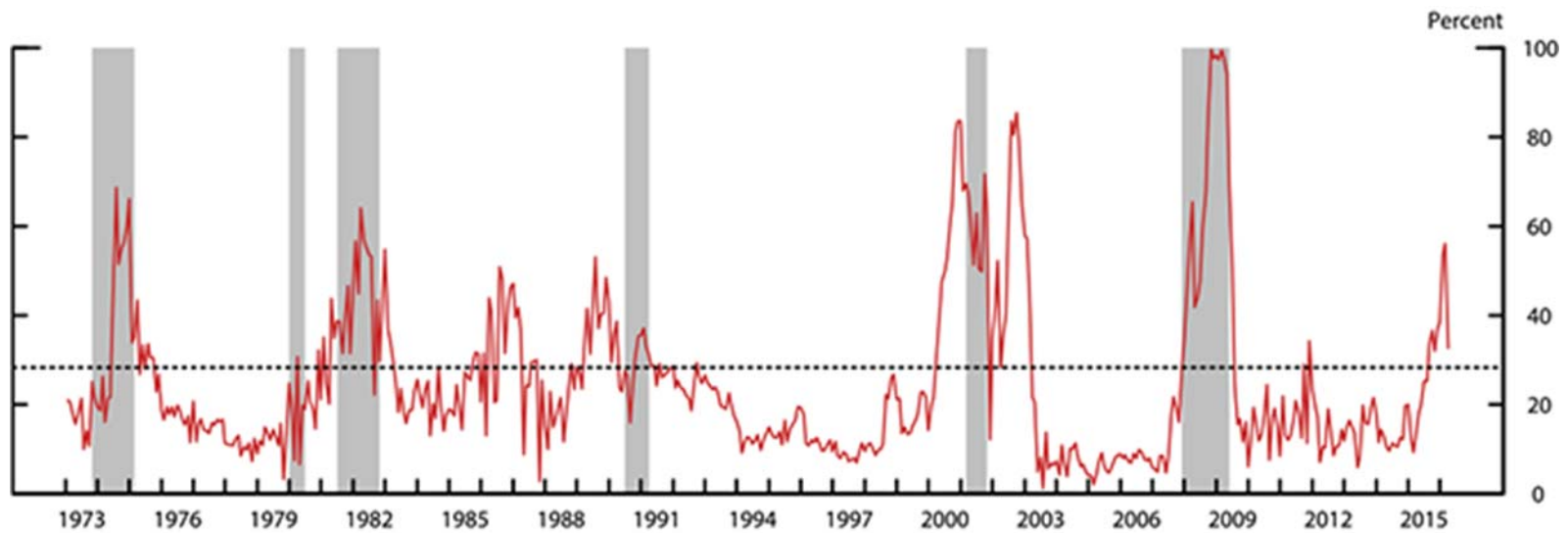
(a) GZ credit spread



(b) Excess bond premium



Recession Probability Based on EBP Only



Updated Recession Probabilities

