
Macro Risk Premium and Intermediary Balance Sheet Quantities

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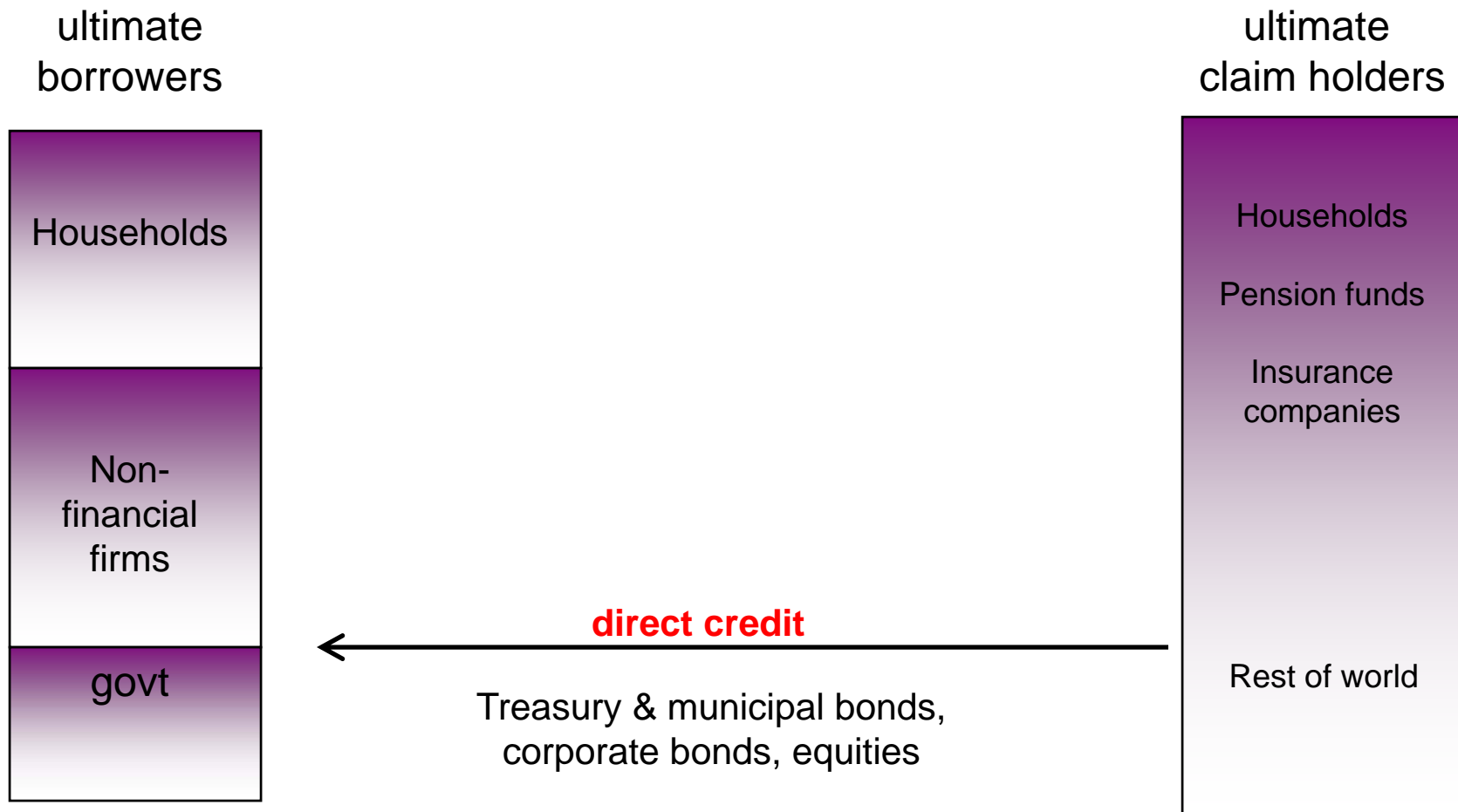
Motivation

- Focus on the role of financial intermediaries in monetary policy transmission
- We estimate reduced form macro-finance model where financial intermediaries are driving boom-bust cycle
- “Risk taking channel” of monetary policy

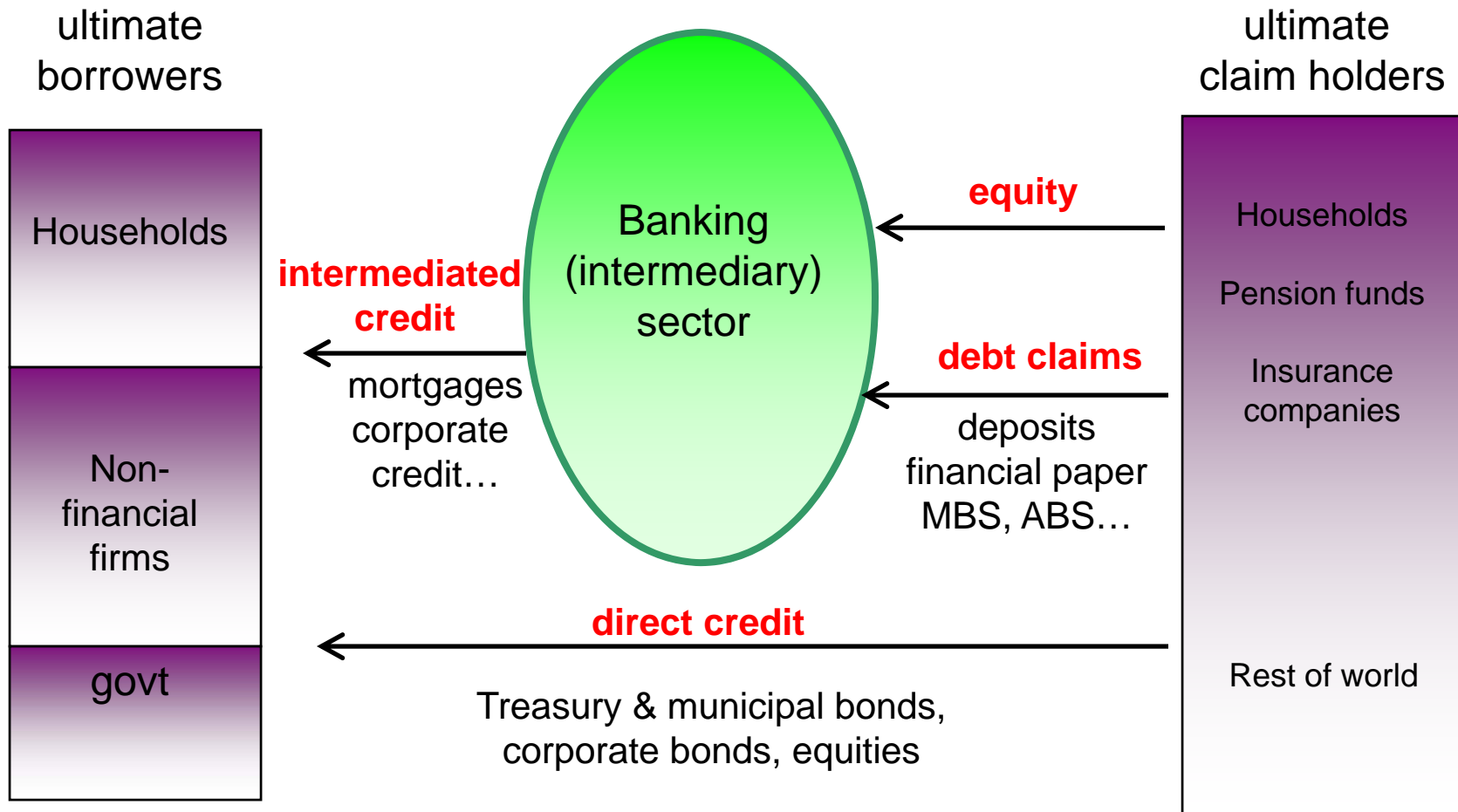
Risk Taking Channel

- Financial intermediaries maximize return on equity subject to VaR constraint
- Tightness of the VaR constraint determines their “risk appetite”
- Risk appetite determines credit supply
- Liquidity injections increase risk appetite

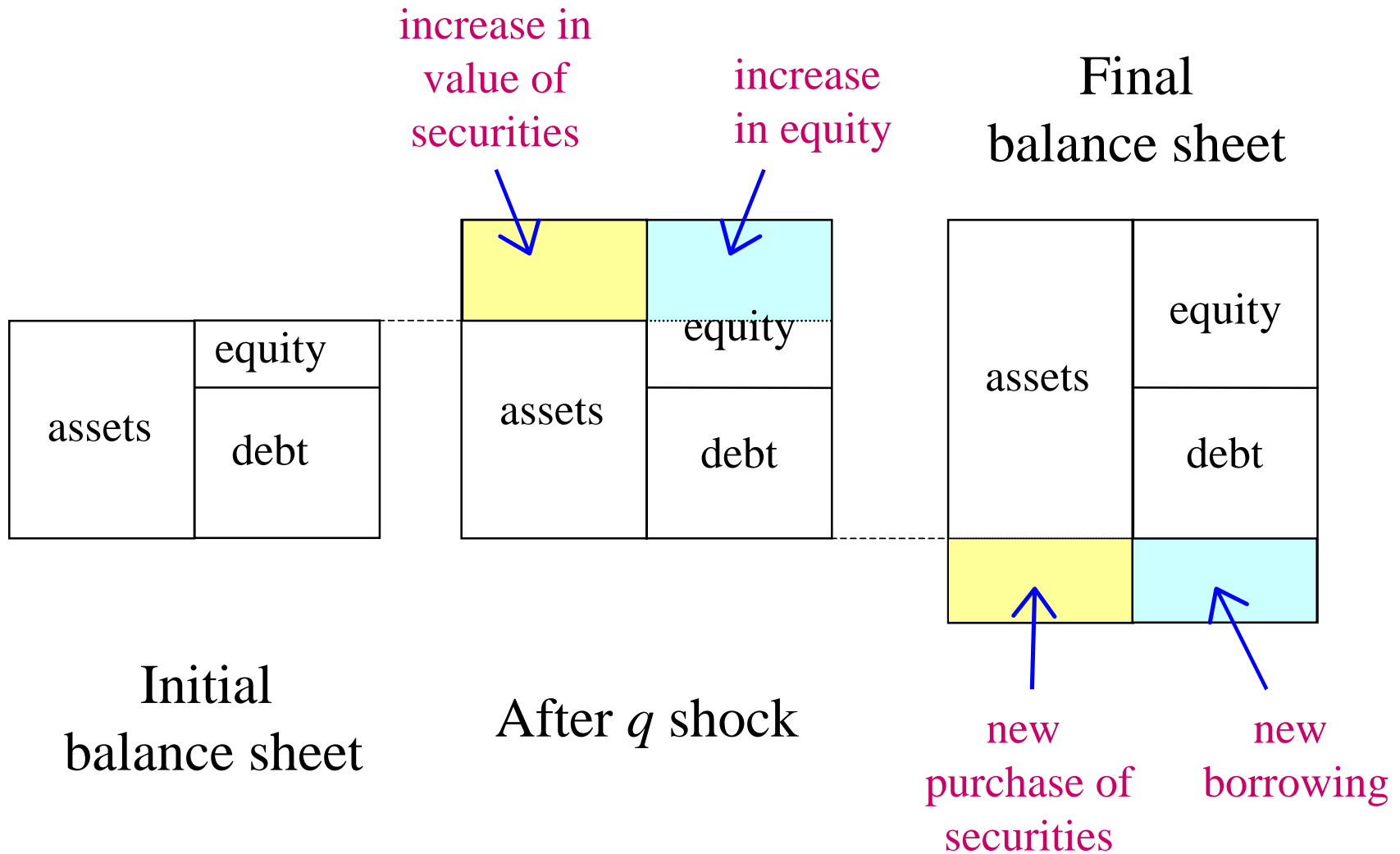
Stylized Financial System



Stylized Financial System



Intermediary Balance Sheet Management

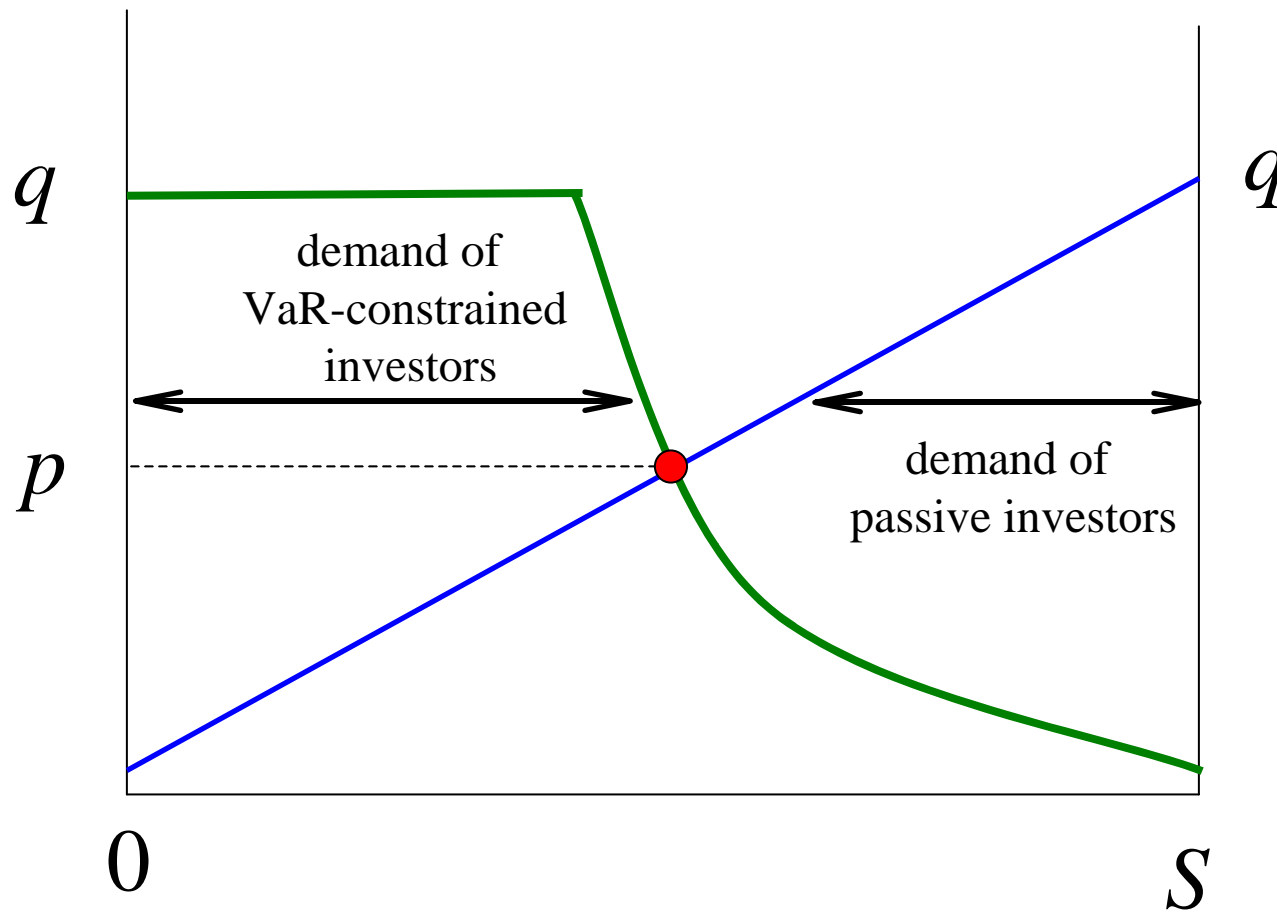


A Model of Financial Intermediaries

(Adrian and Shin, 2009, Handbook of Monetary Economics)

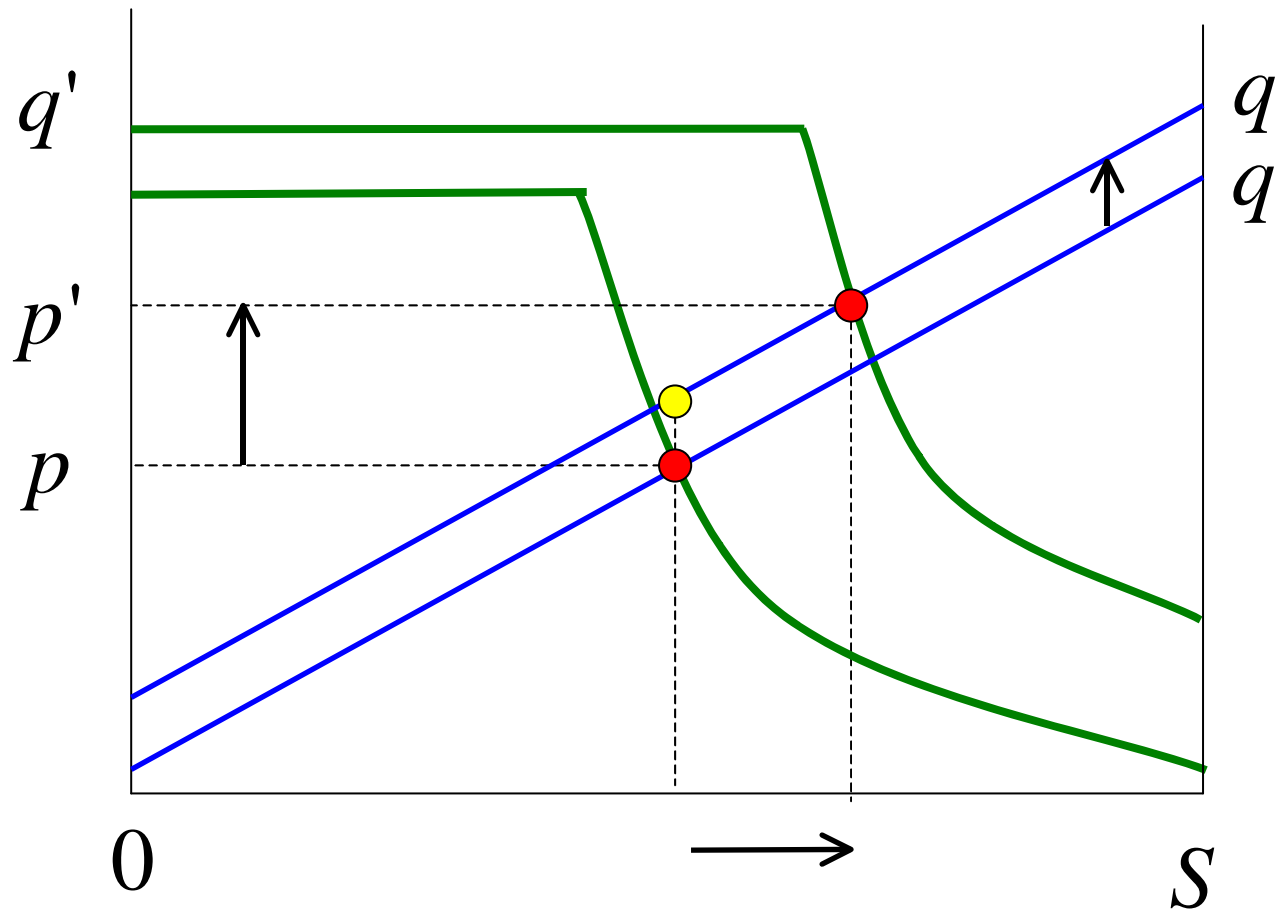
- Active investors face VaR constraint
→time varying risk aversion
- Passive investors have mean-variance preferences
- Payout: q , asset price: p , return: $q/p-1$
- Asset supply: S

Determination of Risk Premia

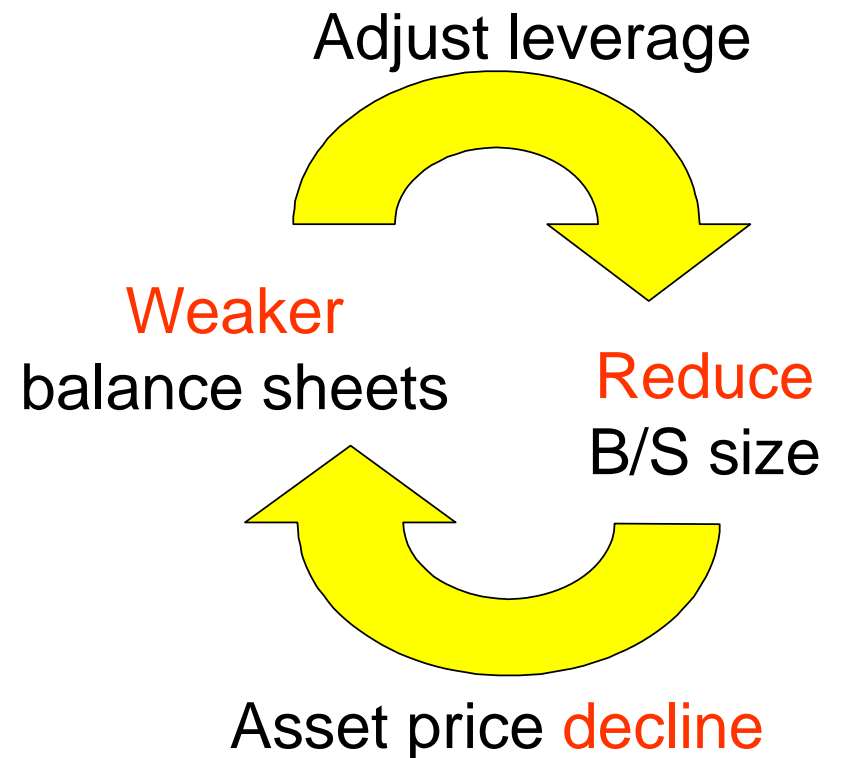
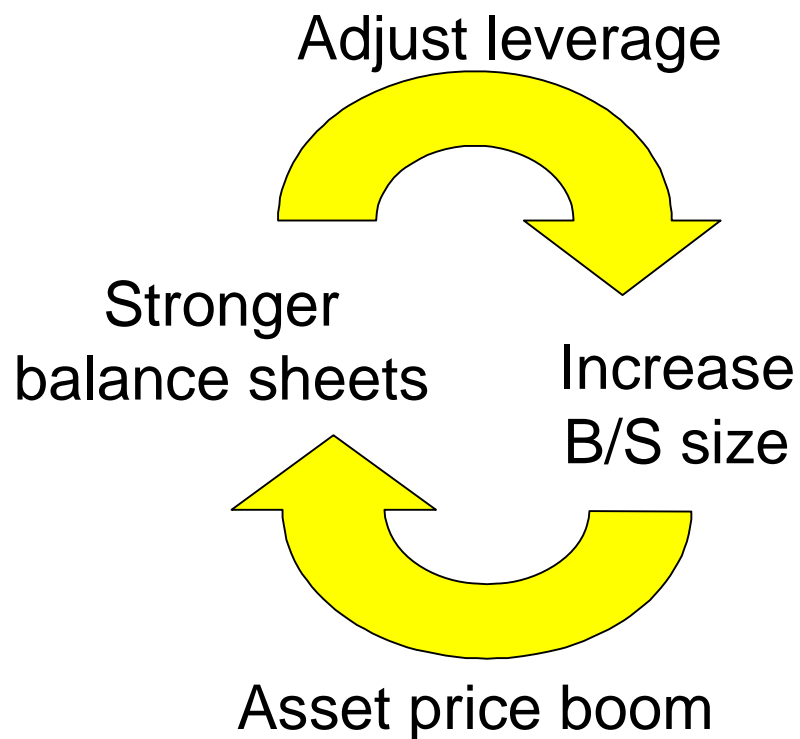


Compression of Risk Premium

From Increase in Intermediary Balance Sheets

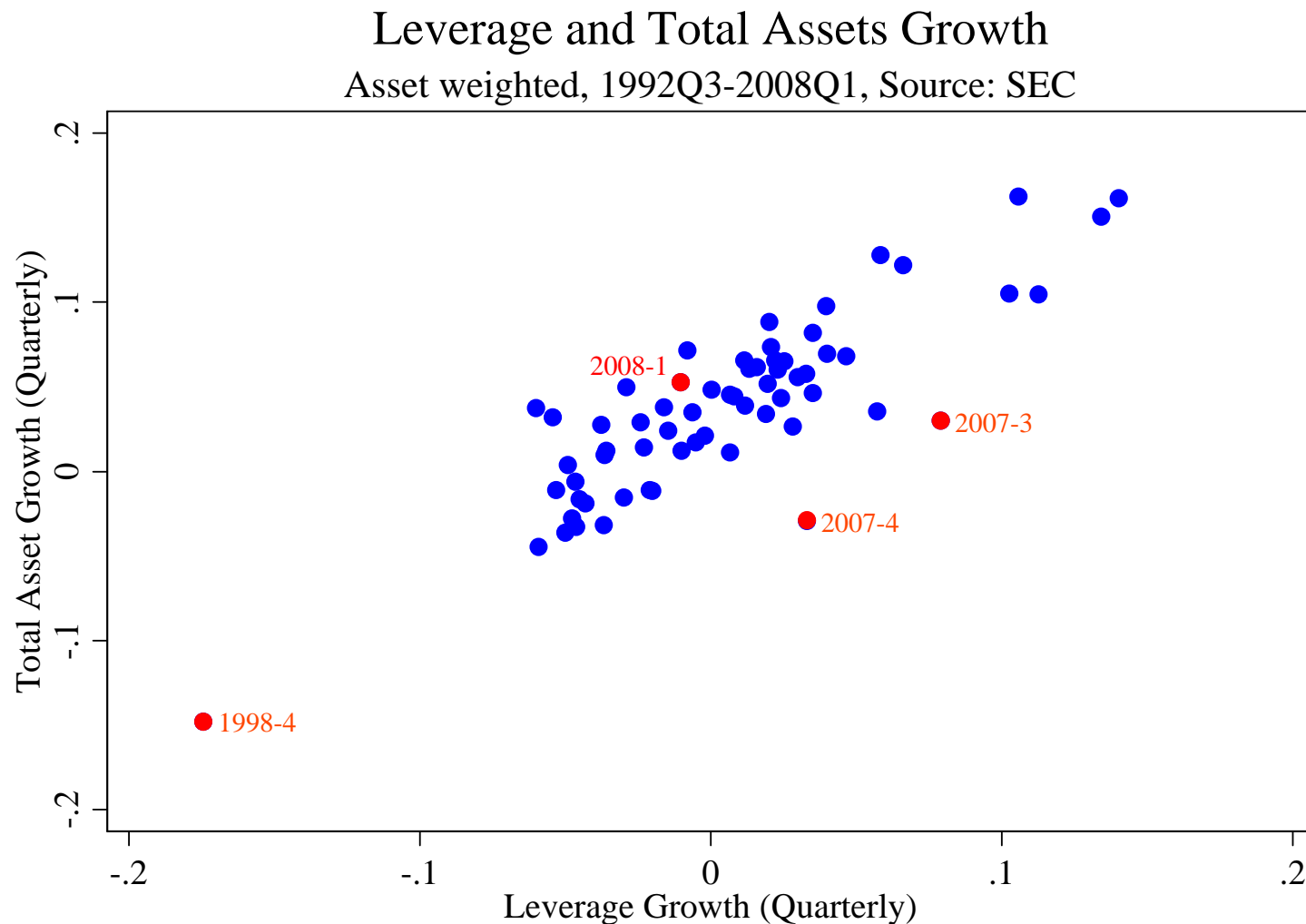


Balance Sheet Amplification



Procyclical Leverage of US Investment Banks

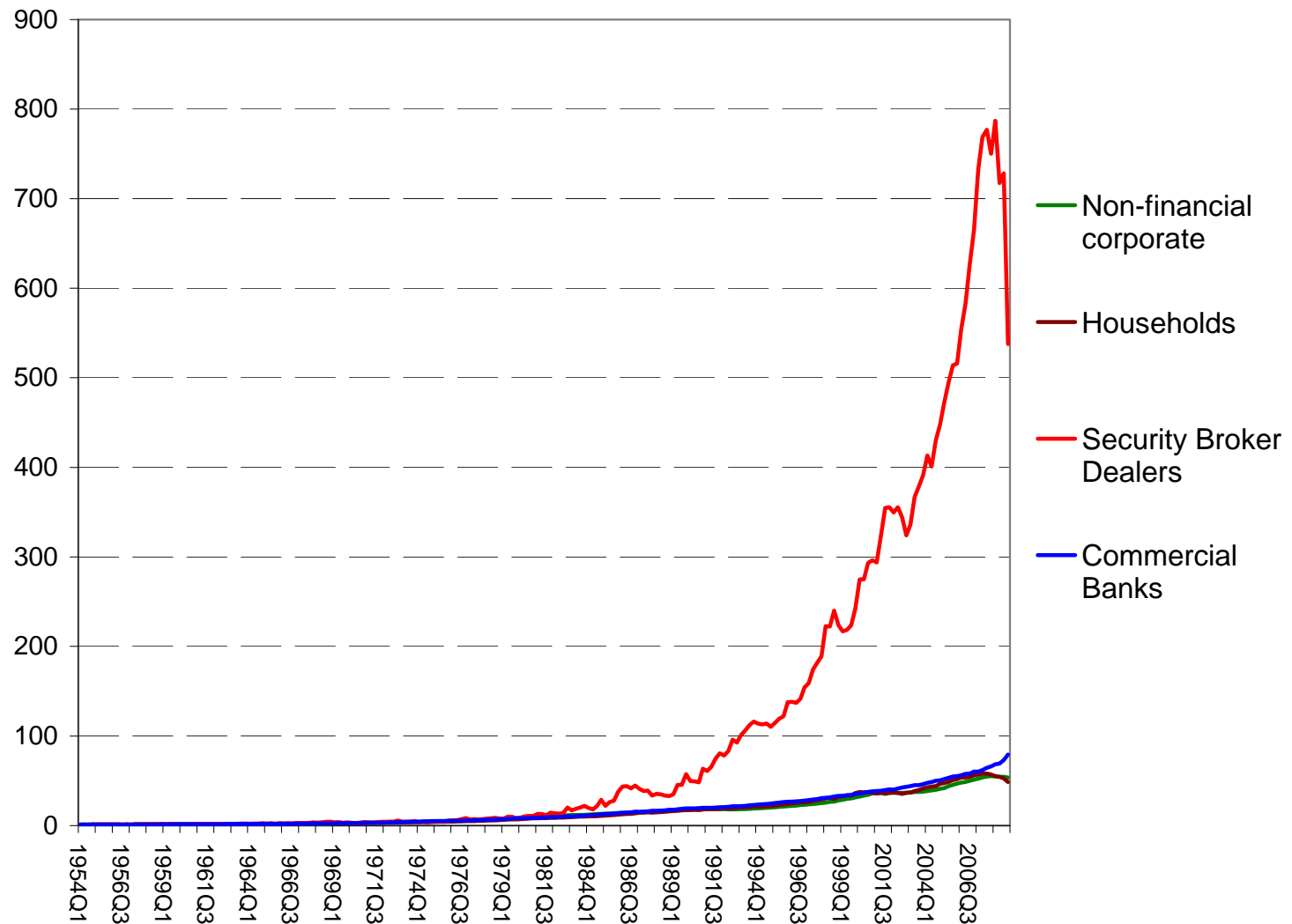
(Adrian and Shin, 2007)



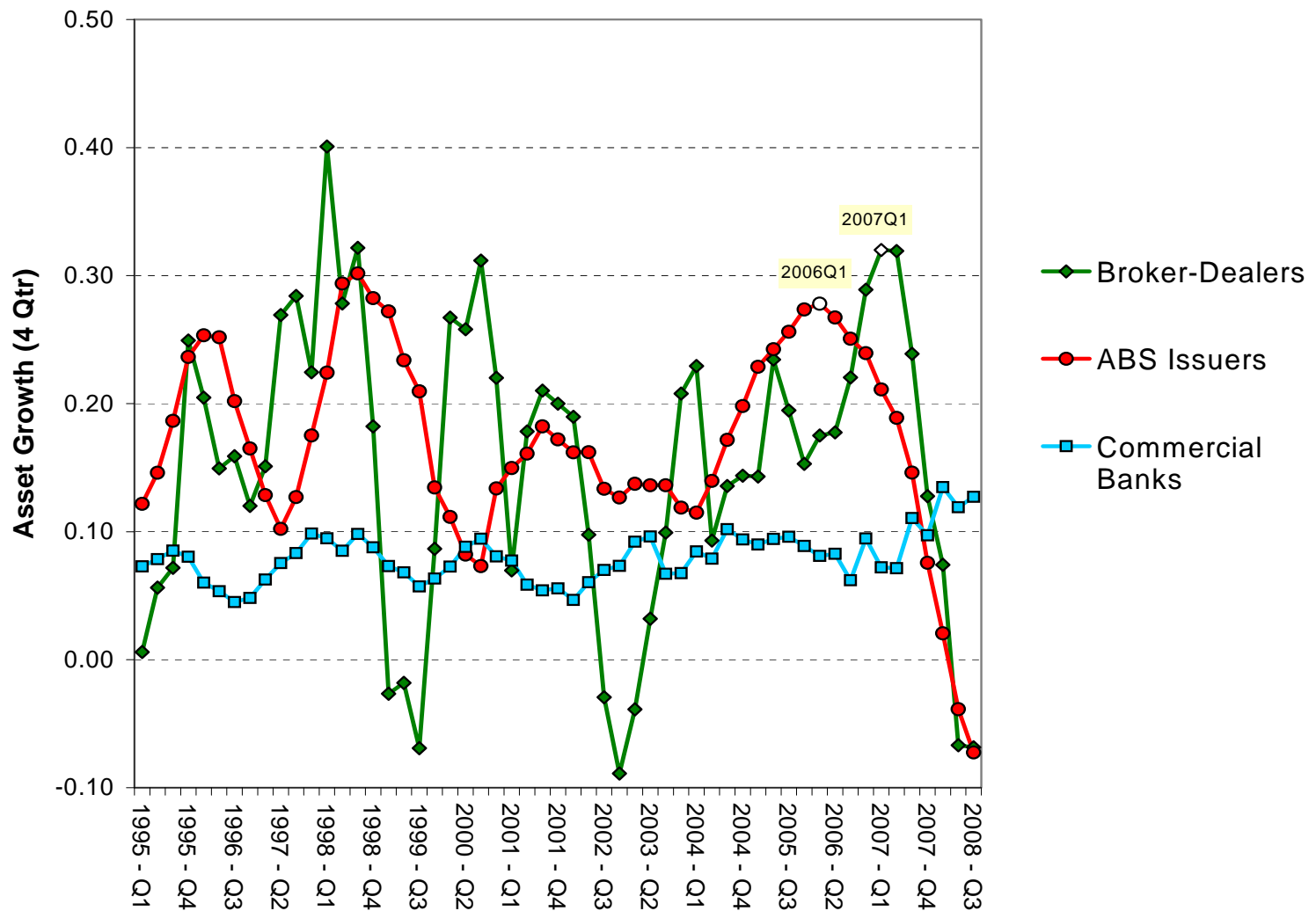
Balance Sheet Amplification

- Stronger balance sheets give surplus capital
- Analogy with “surplus capacity” in manufacturing
- For such surplus capacity to be utilized, the intermediaries must expand their balance sheets
- On the liability side, they take on more debt
- On the asset side, they search for potential borrowers
- Greater willingness to lend leads to an erosion in risk premium from lending, and spreads become compressed

Growth of Assets of Four Sectors (March 1954 = 1)



Annual Growth Rates of Assets



Reduced Form Macro-Finance Model

- IS curve:
$$y = a_y + b_y (i - \pi) + c_y r$$
- Macro risk premium:
$$-\Delta r = a_r + b_r y_{lag} + c_r i_{lag} + d_r \lambda_{lag}$$
- Phillips curve:
$$\pi = a_\pi + b_y y$$
- Target rate rule:
$$i = a_i + b_i y + c_i \pi + d_i r + e_i \lambda$$

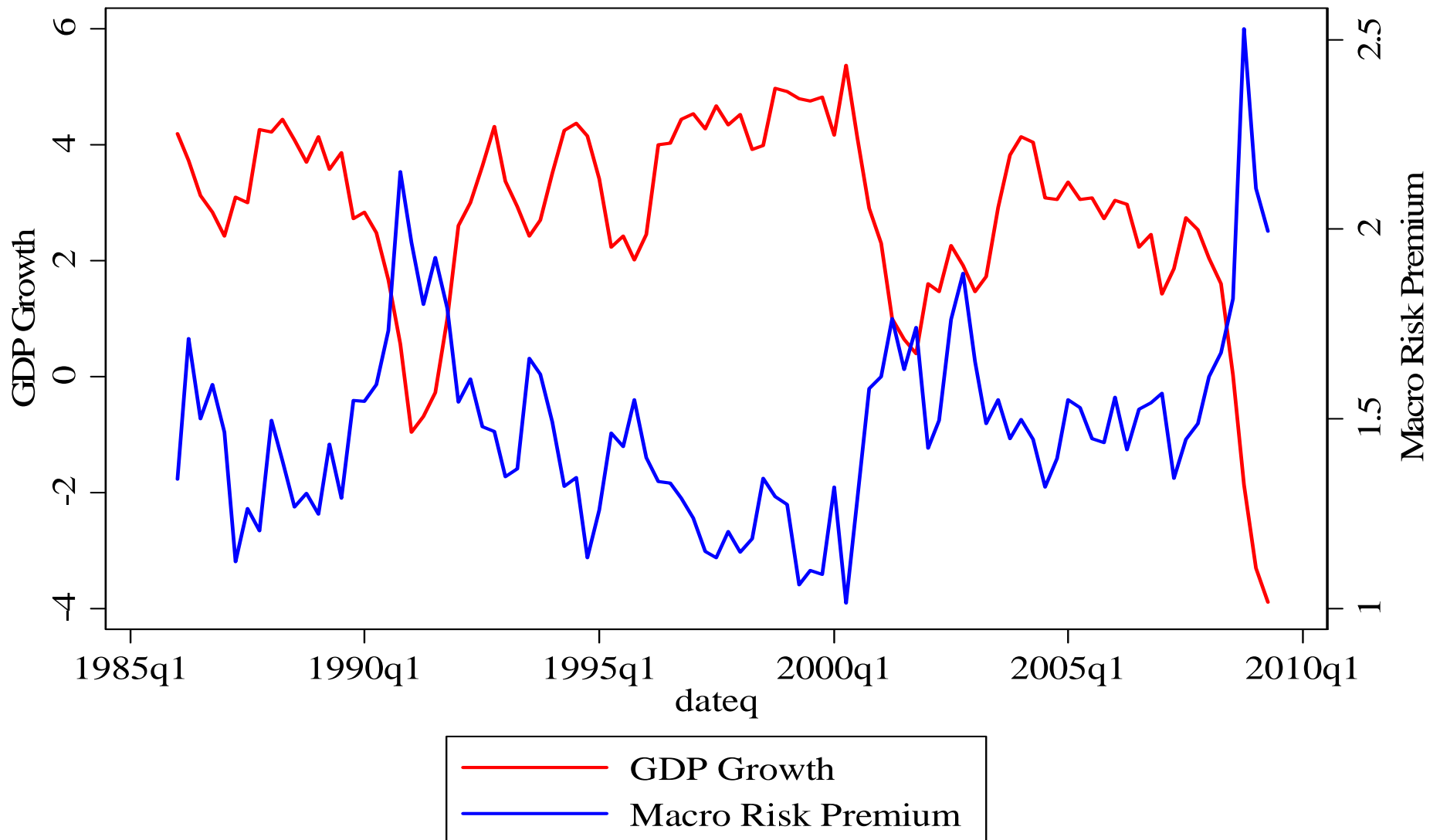
Reduced Form Macro-Finance Model

- Real activity y is pinned down by real rate AND macro risk premium “ r ”
- Returns to the macro risk premium “ $-\Delta r$ ” are predictable by macro variables y and i , as well as by “intermediary risk appetite λ ”
- Interest rate setting might depend on r and λ as well as real growth and inflation

Estimation of the Macro Risk Premium

- We estimate the macro risk premium by contemporaneously regressing GDP growth on a wide variety of Treasury and credit spreads
- Constant maturity yields and credit spreads
- Macro risk premium is combination of yields and spreads most correlated with GDP growth
- We rotate the macro risk premium to make it most highly correlated with the AA credit spread

Macro Risk Premium



Sources: Bureau of Economic Analysis, Standard & Poors, Federal Reserve Board of Governors

Determinants of the Macro Risk Premium

	(1)	(2)	(3)
Yield Level Factor	-0.09***		
Yield Slope Factor	0.04***		
Credit Spread Level Factor	0.22***		
Credit Spread Slope Factor	0.30***		
Real Fed Funds		-0.06***	
PCE Inflation			0.07**
Constant	0.84***	1.59***	1.27***
Observations	90	90	90
Adjusted R-squared	0.680	0.222	0.095

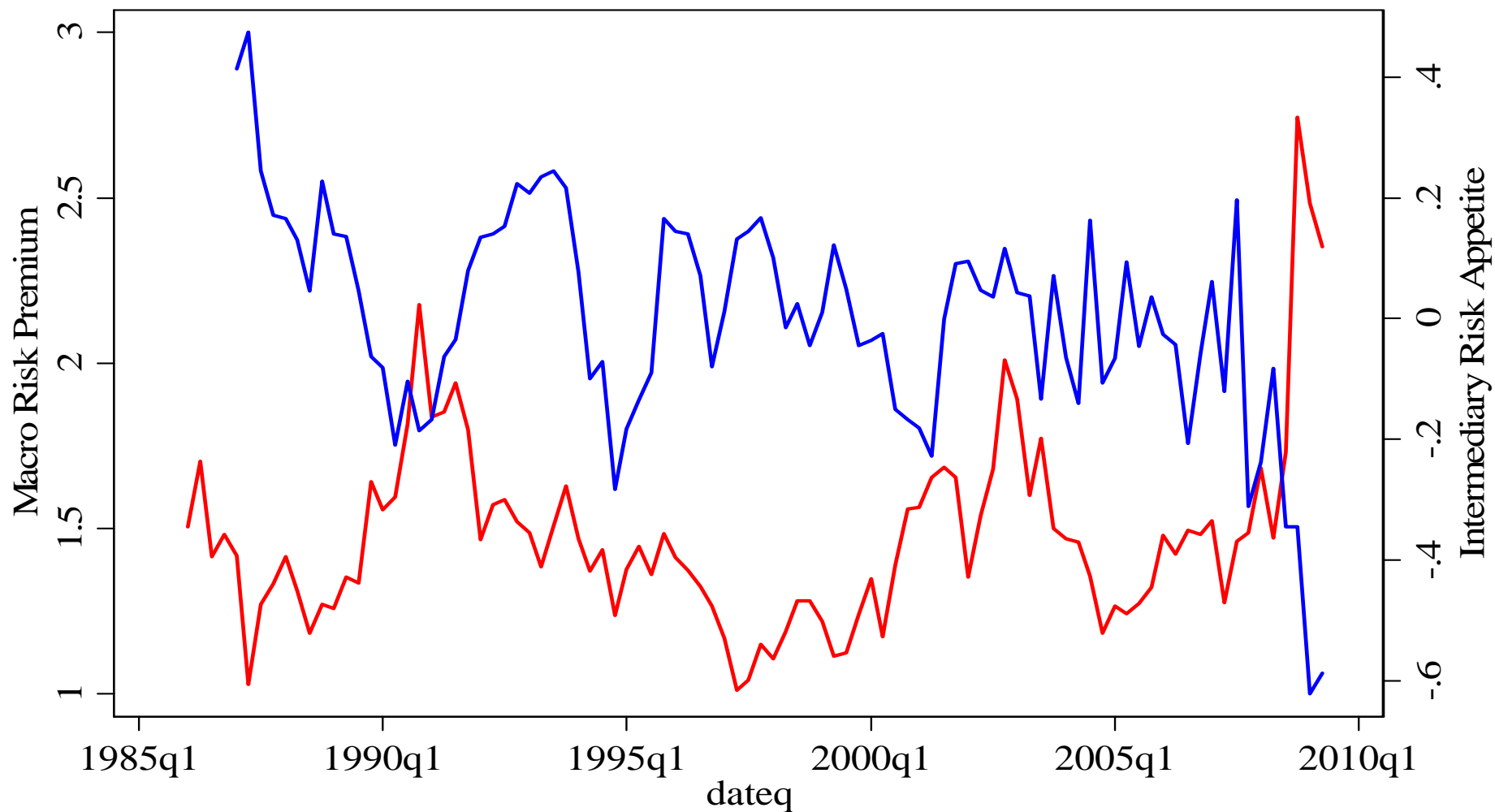
Estimation of Risk Appetite

- Not clear which institutions are the most important in determining risk premia for the economy as a whole
- We run forecasting regressions for the negative changes of the macro risk premium on a variety of balance sheet measures from different classes of financial institution
- For each type of institution, we include asset growth and the growth of net worth as potential variables
- We also include the growth rates of assets and net worth weighted by the relative size of total assets

The Intermediary Risk Appetite Factor

	Negative of Annual Change of the Macro Risk Premium		
	(1)	(2)	(3)
Broker-Dealer Asset Growth (year lag)	0.00*		0.00
Broker-Dealer Equity Growth (year lag)	0.03**		-0.02
Shadow Bank Asset Growth (year lag)	0.01**		0.01
Shadow Bank Equity Growth (year lag)	-0.02		-0.42
Commercial Bank Asset Growth (year lag)	-0.05***		-0.03
Commercial Bank Equity Growth (year lag)	-0.04		-0.31
Broker-Dealer Asset Growth (year lag, weighted)		0.07	0.02
Broker-Dealer Equity Growth (year lag, weighted)		1.17**	2.01*
Shadow Bank Asset Growth (year lag, weighted)		-0.03	-0.04
Shadow Bank Equity Growth (year lag, weighted)		-0.25	2.54
Commercial Bank Asset Growth (year lag, weighted)		-0.04	-0.05
Commercial Bank Equity Growth (year lag, weighted)		-0.08	0.91
R-squared	0.214	0.032	0.280

Intermediary Risk Appetite and the Macro Risk Premium



GDP Growth and Intermediary Risk Appetite

GDP Growth (lag)	0.87***	0.76***	0.90***
PCE Inflation (lag)	-0.14	-0.24*	-0.10
Fed Funds Target (lag)	0.01	0.00	-0.05
Intermediary Risk Appetite (lag)	2.42***	1.94***	1.48***
VIX (lag)		0.02	
Moody's BAA / 10-Year Treasury Spread (lag)		-0.63***	
10-year / 3-month Treasury spread (lag)		0.12	
Broker-Dealer Total Asset Growth (lag)			0.01***
ABS Issuer Total Asset Growth (lag)			0.01**
Constant	0.56**	1.97***	0.26
R-squared	0.858	0.875	0.869

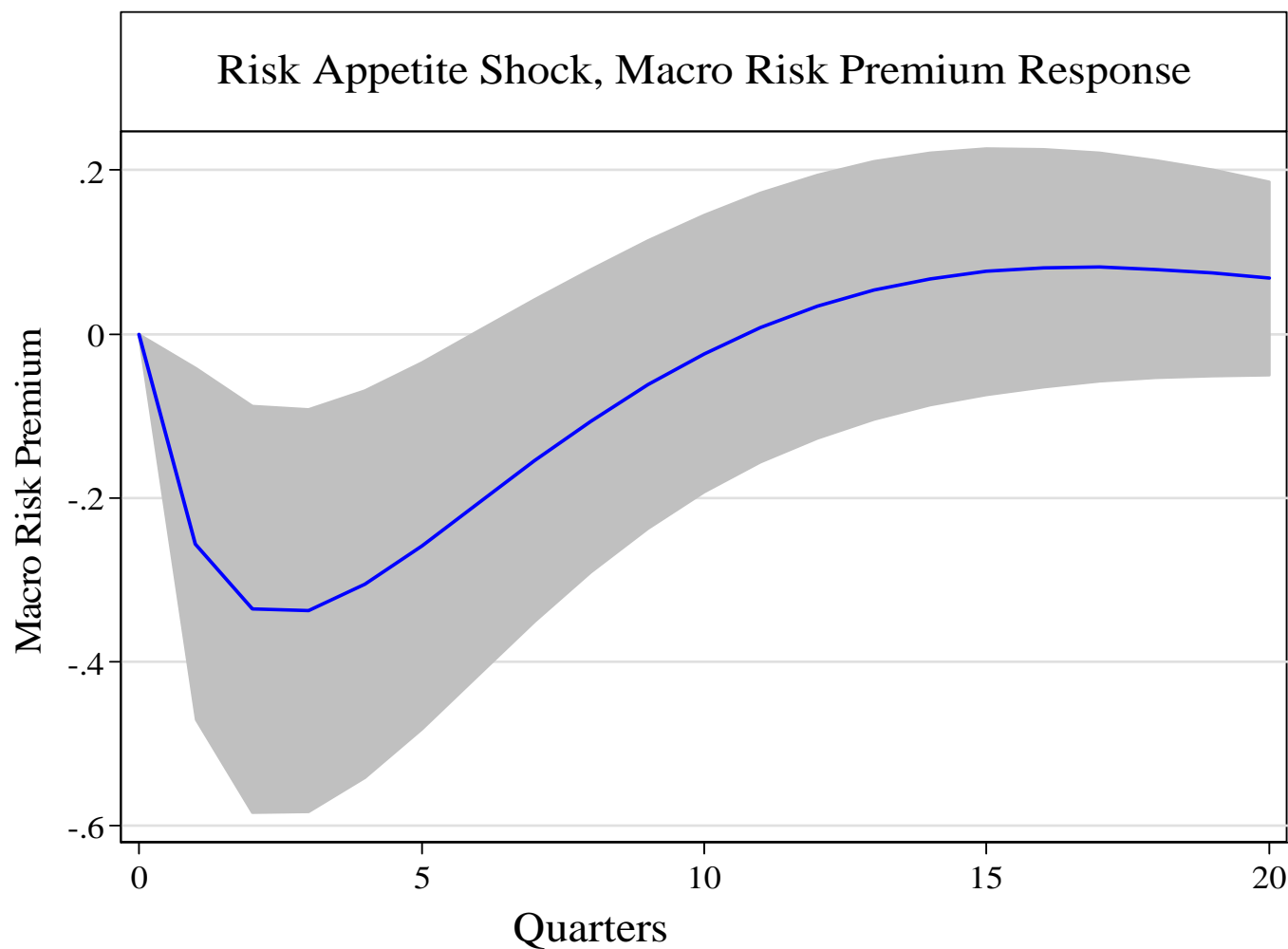
Risk Appetite Vector Autoregression

	GDP Growth	PCE Inflation	Fed Fund	Risk Premium	Risk Appetite
GDP Growth (lag)	0.77***	0.01	0.13**	-0.03*	-0.02
PCE Inflation (lag)	-0.05	0.95***	0.20***	0.02	0.04**
Fed Funds Target (lag)	-0.05	0.00	0.88***	0.00	-0.02**
Macro risk premium (lag)	-0.60	-0.04	-0.84**	0.57***	-0.18**
Risk Appetite Factor (lag)	1.74***	-0.08	0.46	-0.26**	0.52***
Constant	1.85**	0.10	0.82	0.65***	0.30*

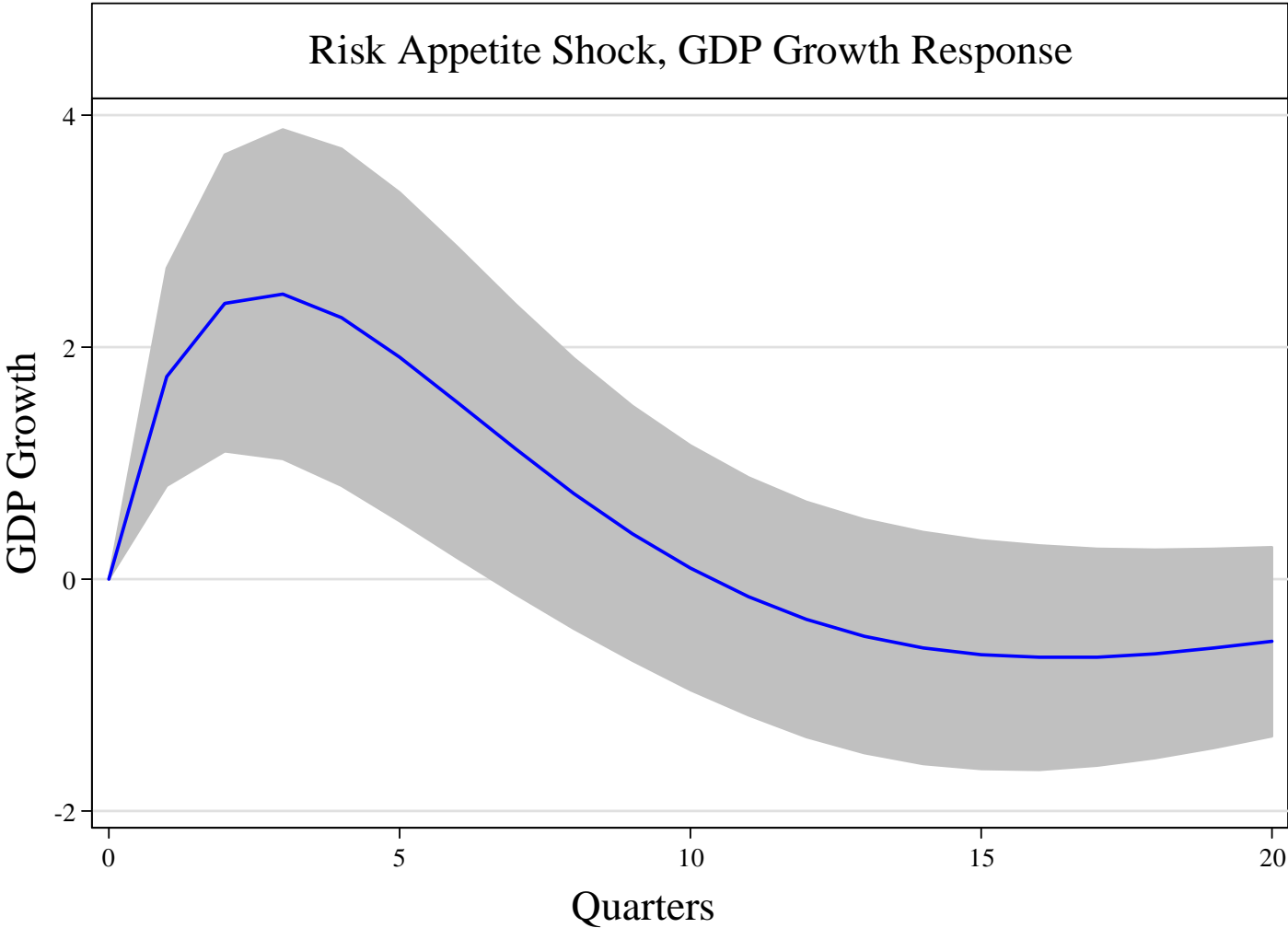
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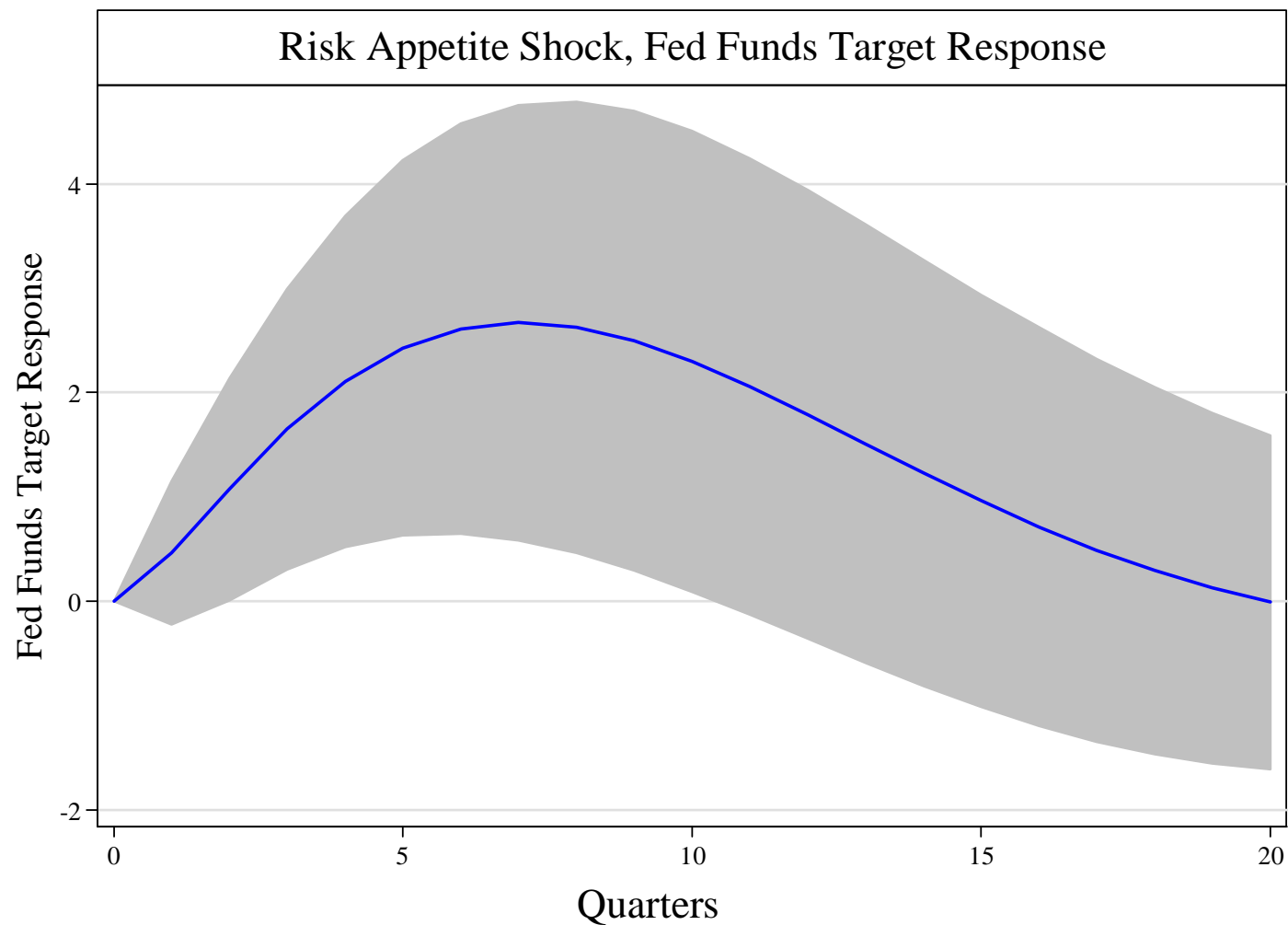
Impulse Responses of Macro Risk Premium to Risk Appetite Shock



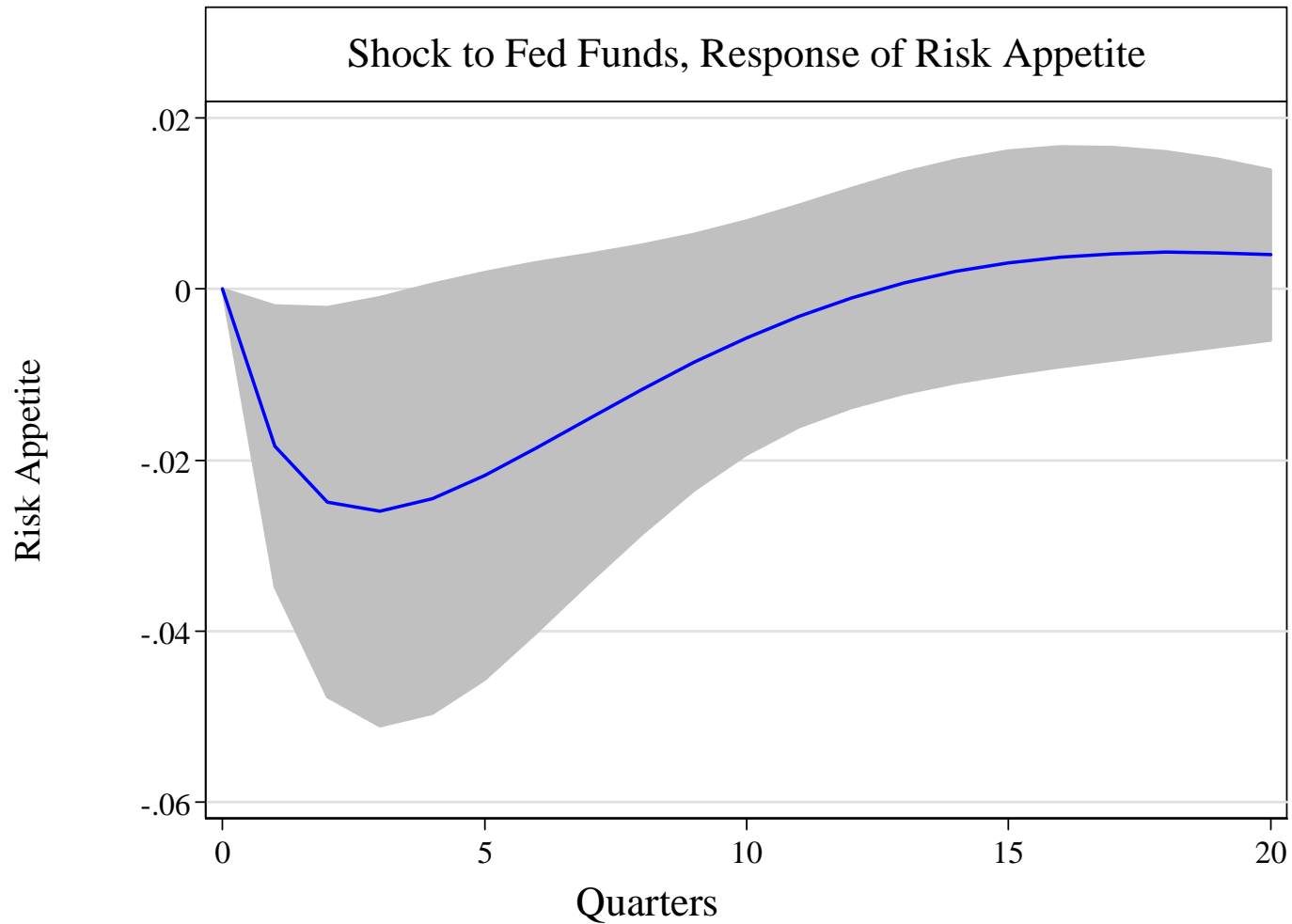
Impulse Responses of GDP Growth to Risk Appetite Shock



Impulse Responses of Fed Funds Target to Risk Appetite Shock



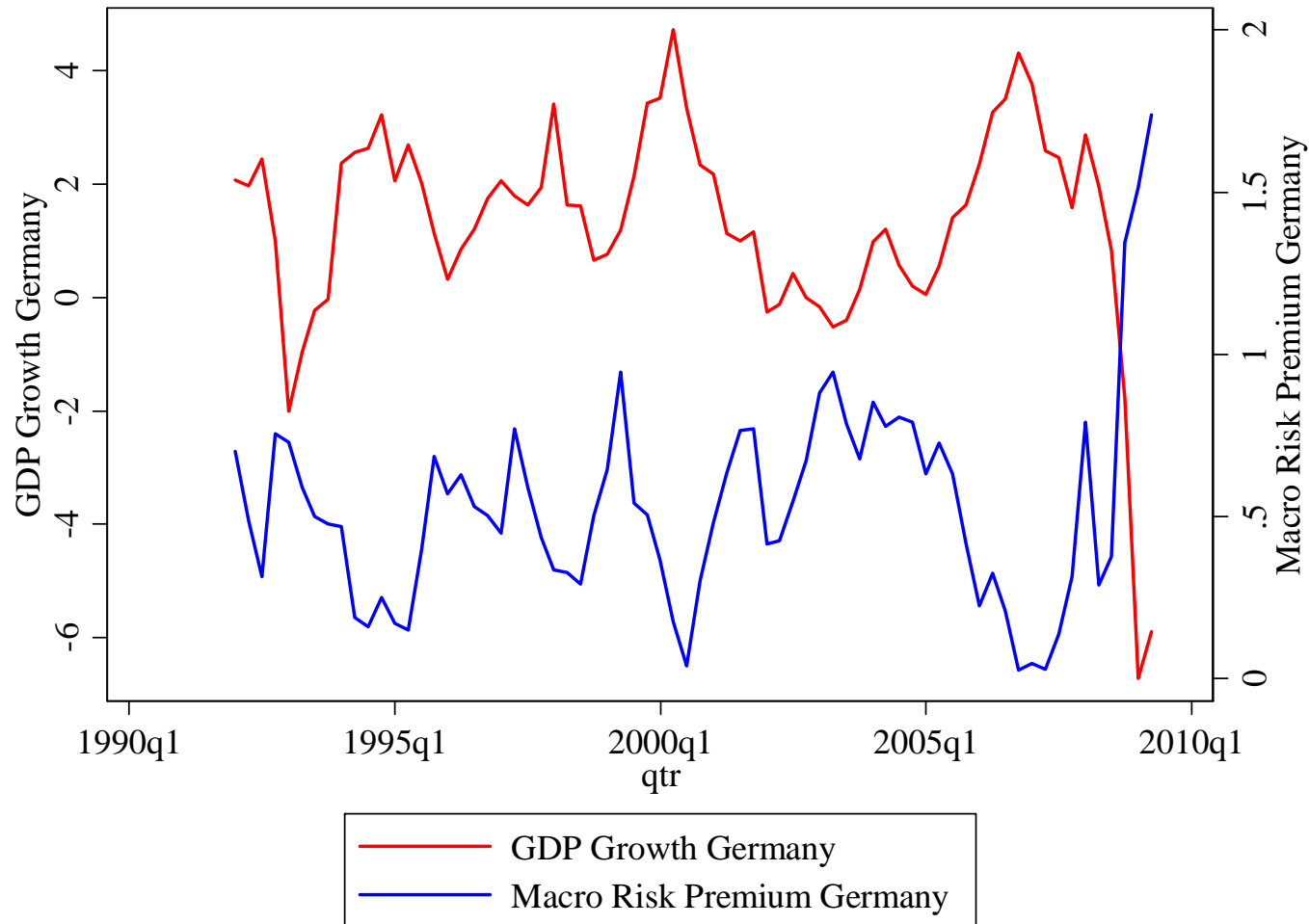
Impulse Responses of Risk Appetite to Fed Funds Target Shock



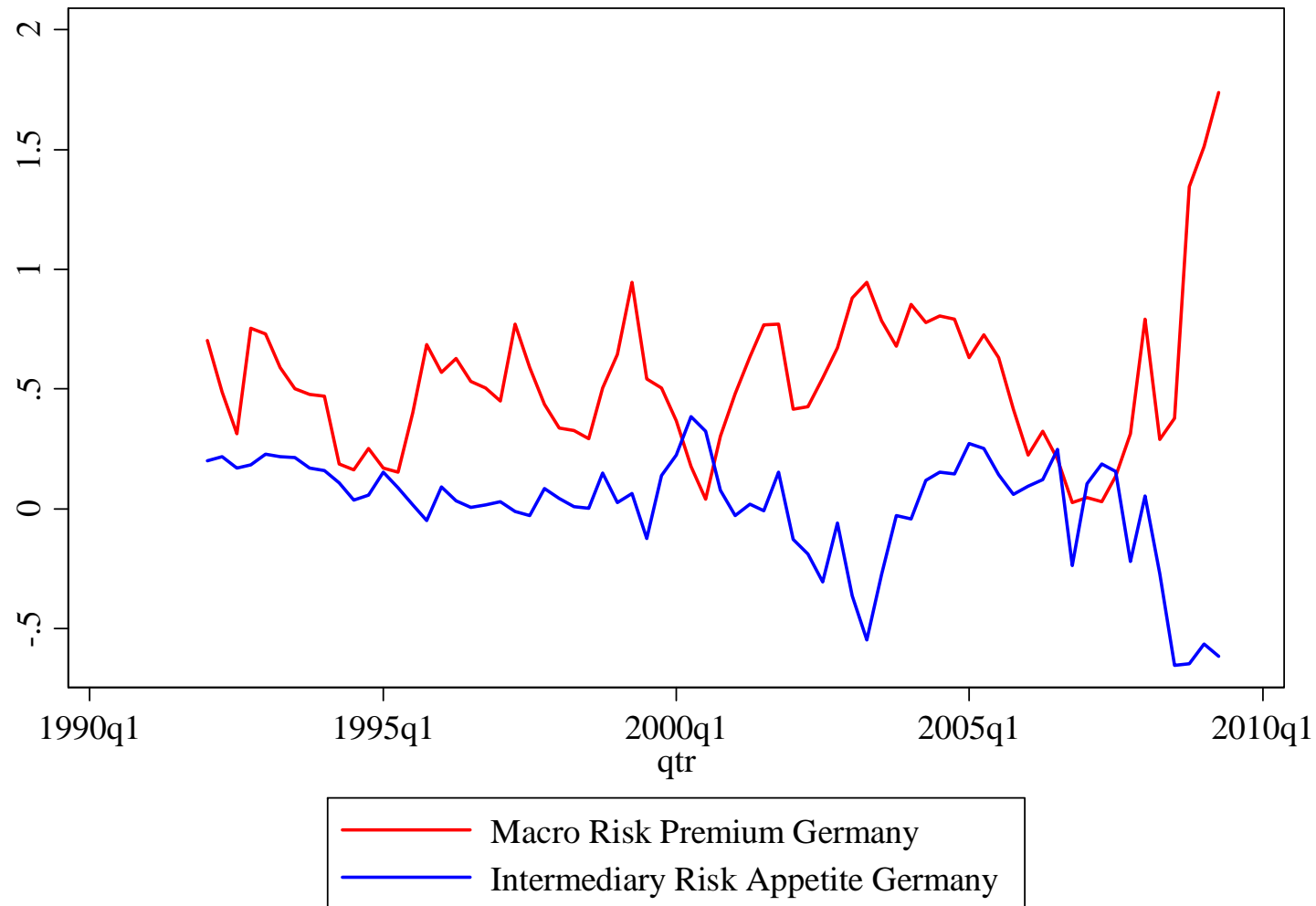
International Comparison: Germany, Japan, and UK

- International results limited by Flow of Funds data
- Nature of financial intermediation varies across countries
 - predictability of macro risk premia by intermediary balance sheets varies
- VAR analysis limited by short data

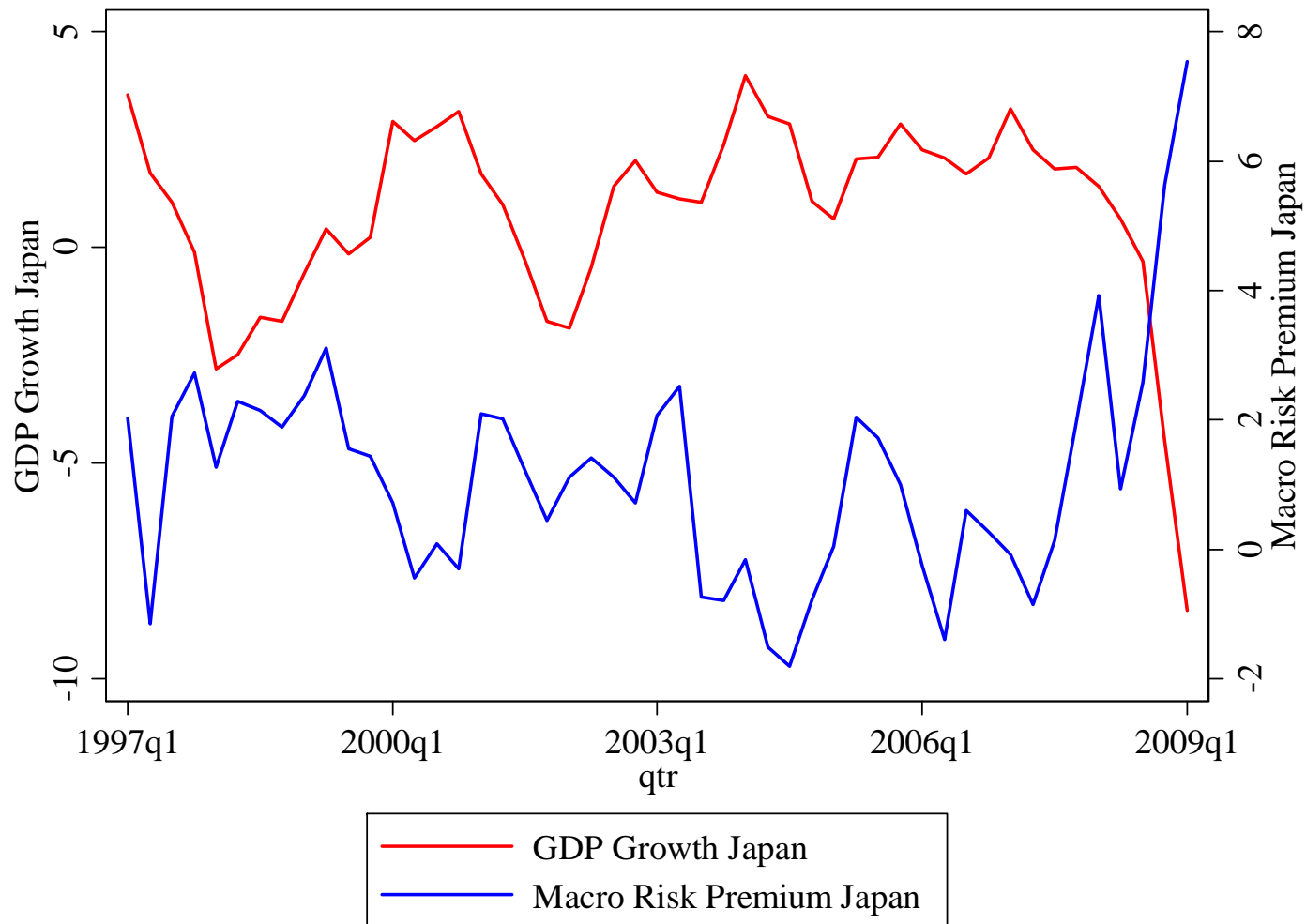
Macro Risk Premium for Germany



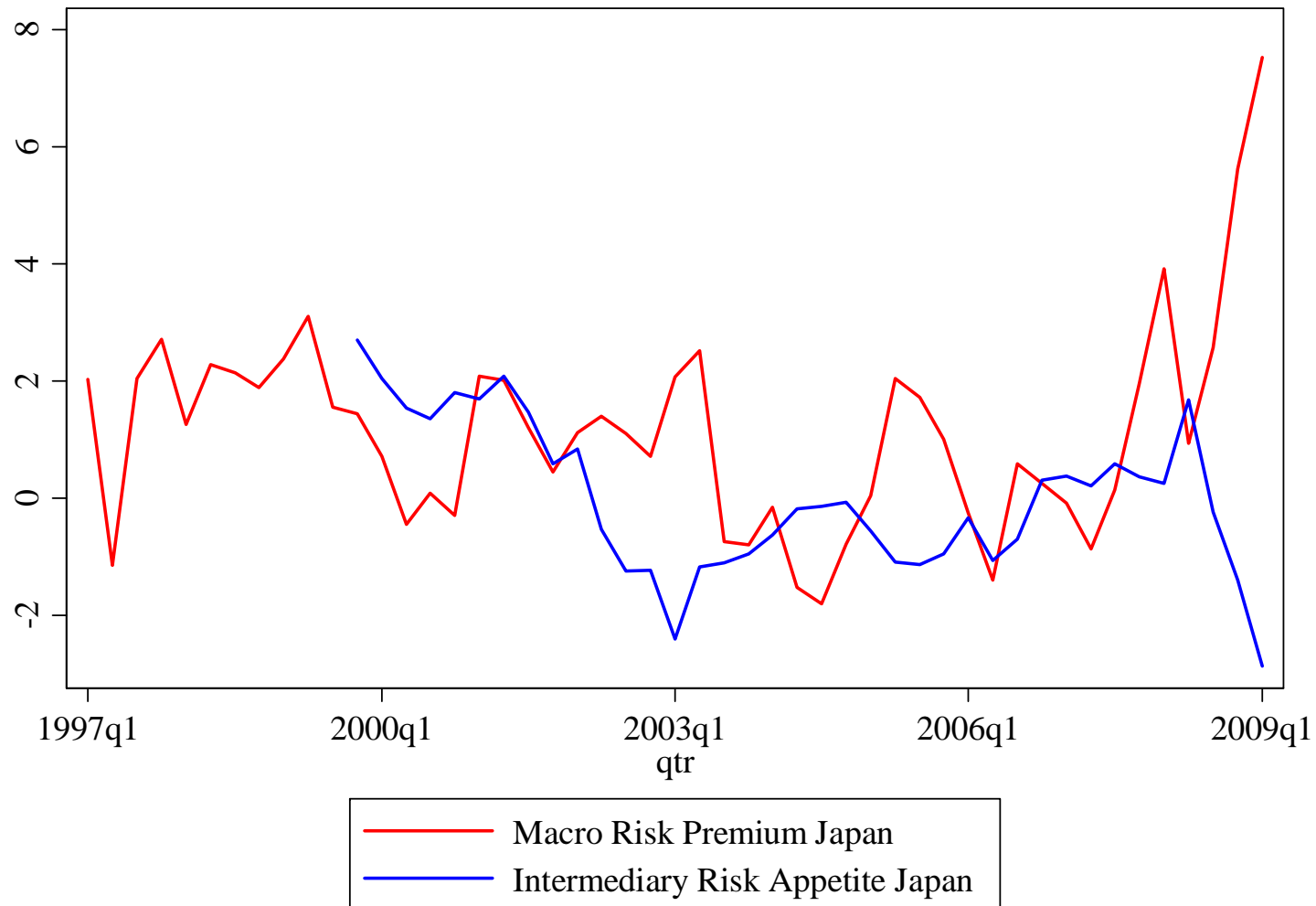
Intermediary Risk Appetite for Germany



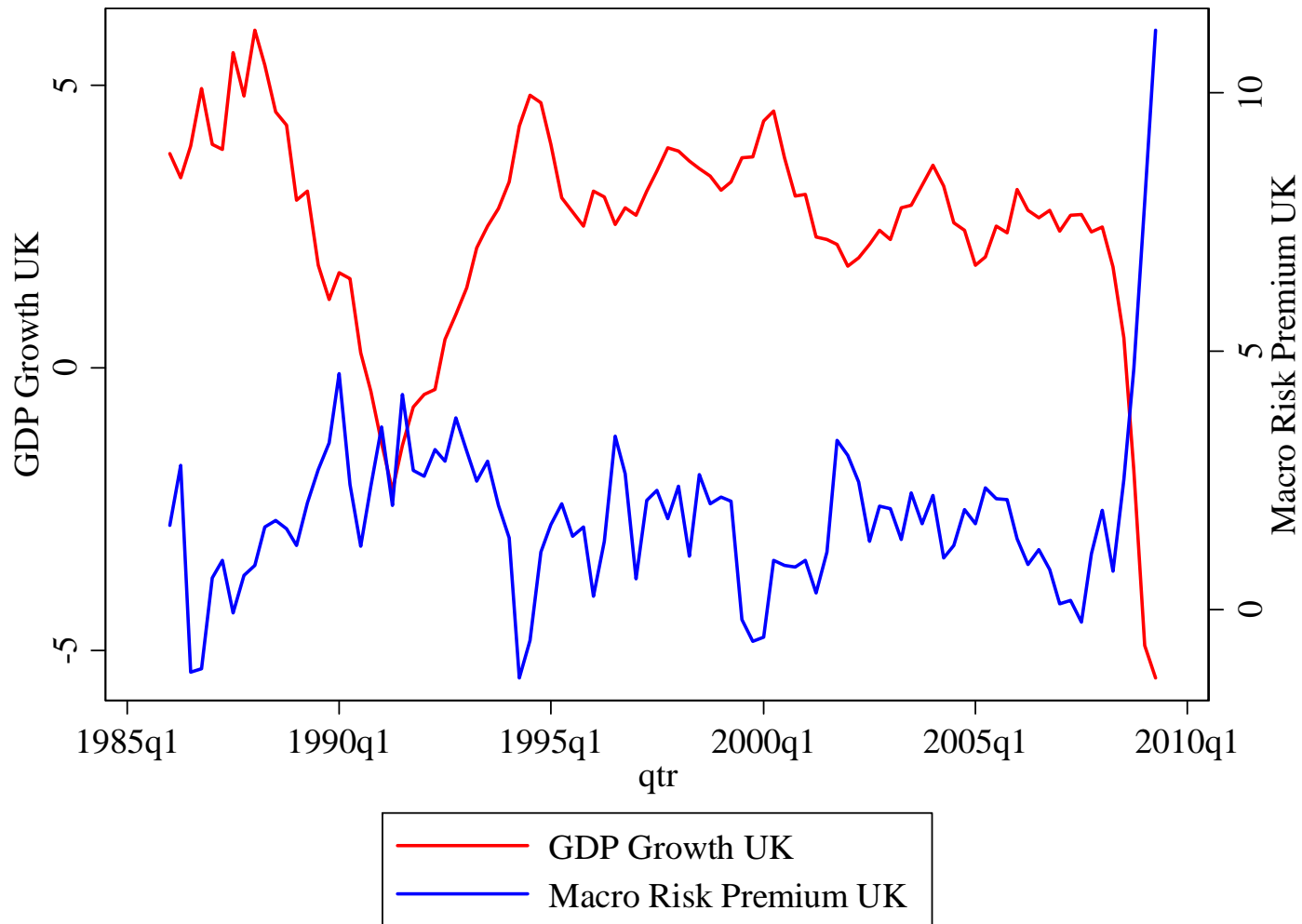
Macro Risk Premium for Japan



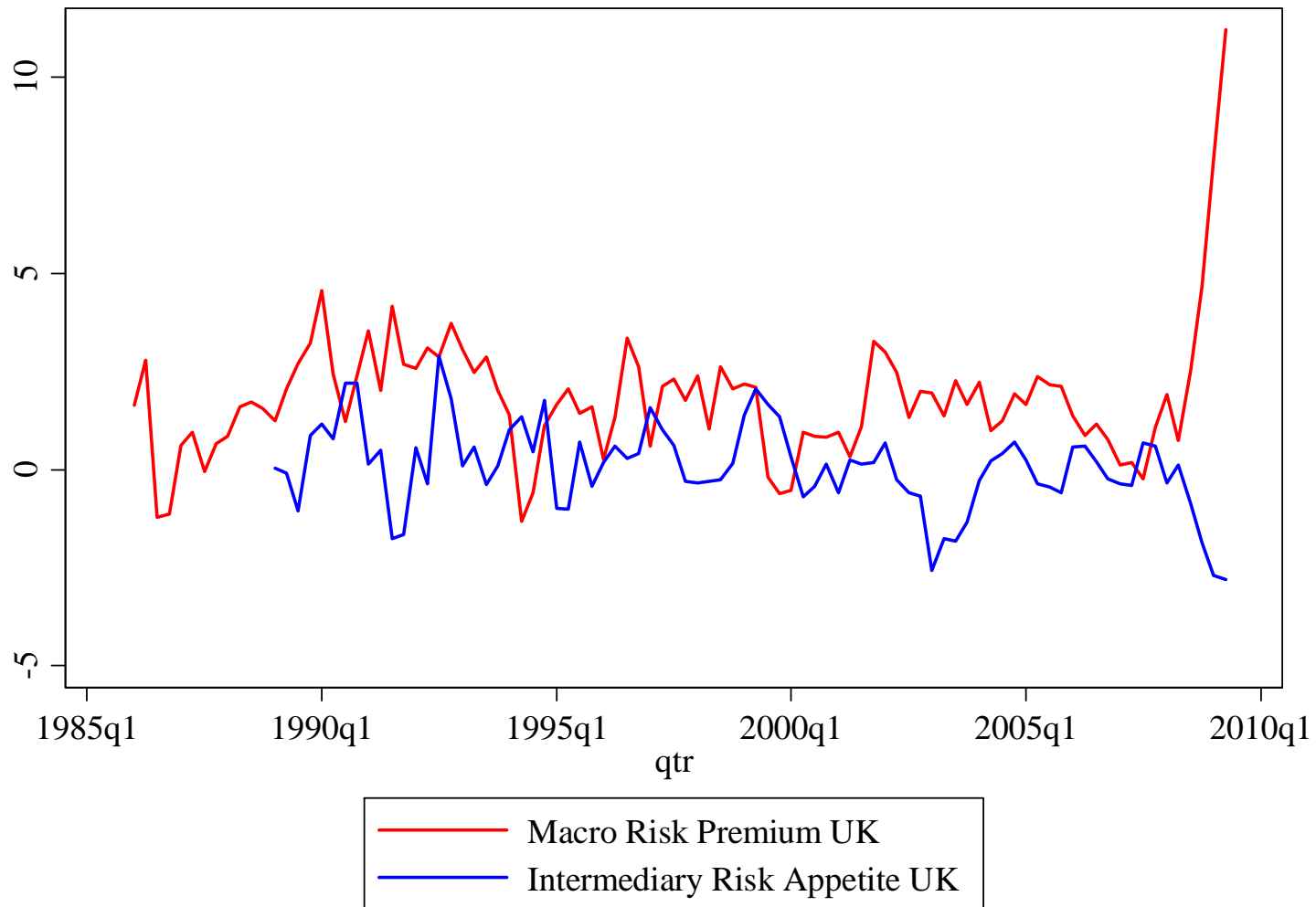
Intermediary Risk Appetite for Japan



Macro Risk Premium for the UK



Intermediary Risk Appetite for the UK



Related Research

- Formal asset pricing
(Adrian, Moench, Shin, 2009)
- Structural modeling
(Gertler and Kiyotaki, 2009)
- Study of nonconventional central bank policies
(work at Fed, ECB, and other central banks)

Conclusion

- Funding constraints determine financial intermediaries' risk appetite
- Tightness of financial intermediary constraints drive risk premia and credit supply
- “Risk taking channel” of monetary policy