What Drives Shadow Banking? Evidence from Short-Term Business Credit

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* The views expressed are those of the author, and are not necessarily those of the Federal Reserve Bank of Dallas or of the Federal Reserve System.

Introduction

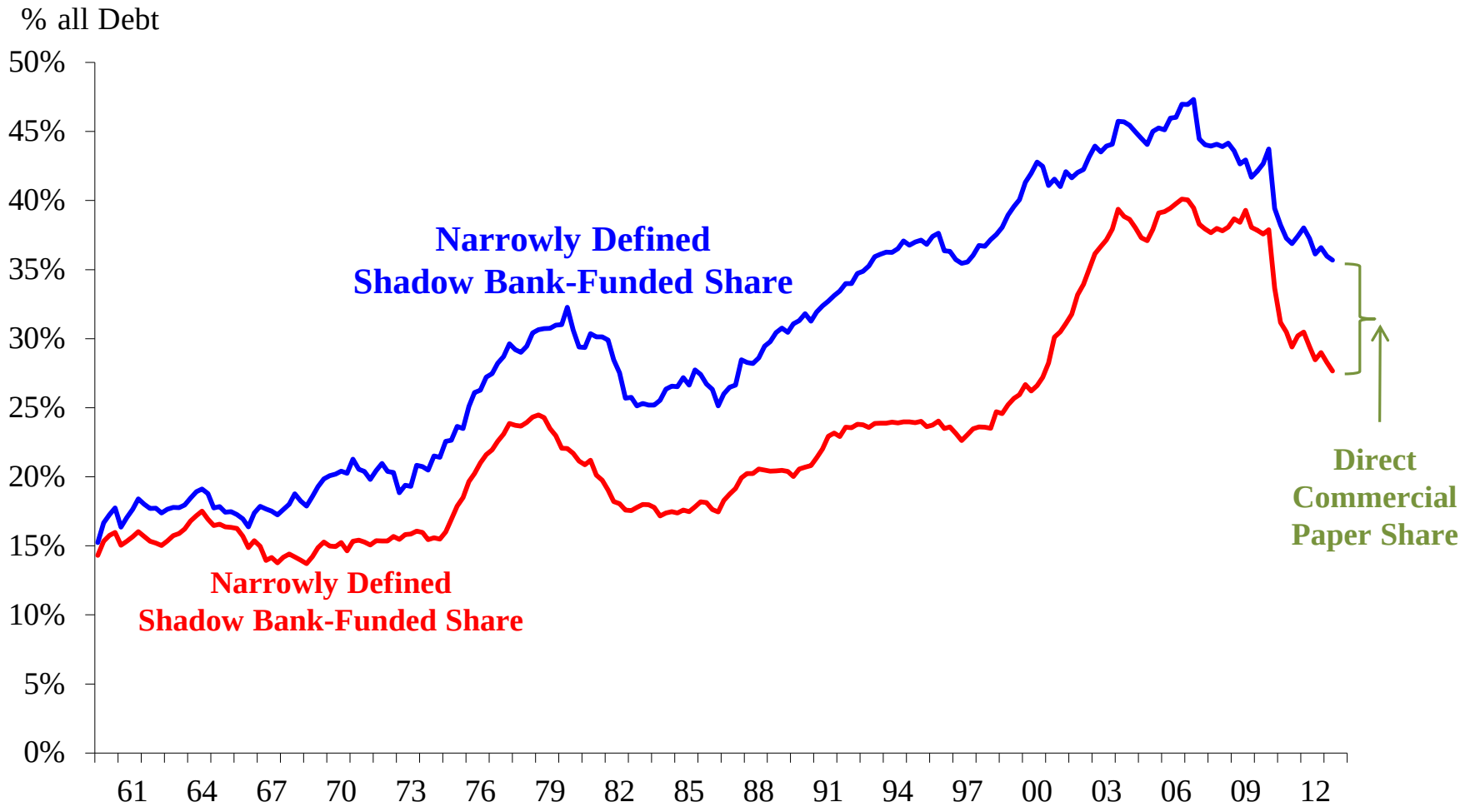
- Much less written on business credit. Focus on insights from modelling short-term business credit over a half century instead of GSE dominated measures (leave to other panelists)
  - Avoids modelling stock adjustment from financing long-lived RE or debt/equity trade-offs—allows better modelling of short-run factors
  - Also avoid need to model the S&L debacle that impacted real estate financing (and ironically helped spawn MBS and later PMBS market)
- Using one-half century of data gives one the potential to:
  - model various influences (not just most recent fad)
  - disentangle short- from long-run factors, to assess long-run shifts
  - **Not** omit pre-Great Moderation; important information from spanning regulatory regimes—relevant to current attempts at financial reform.
  - Assess impact of various factors:
    - ***Long-run***: regulatory arbitrage, information costs (often neglected)
    - ***Short-run***: Reg Q ceilings, events (BNP Aug '11), start of MMDAs, business cycle, credit controls, and flights to quality (controlling for policy interventions)

Security-Funded or Broadly Defined Shadow Banking System Share of Short-Run Business Credit

- Regulatory arbitrage and improvements in information technology affect the relative appeal and use of security vs. deposit funding of business credit
  - Relative share approach reduces need to include all of the common driving variables of bank and security-funded ("shadow") loans
  - Security funded share of nonfinancial business short-run credit = ratio of [directly issued CP + nonbank financial loans + securitized C&I loans via ABS] to these components and bank C&I loans (Flow of Funds data)
  - Akin to Kashyap-Wilcox-Stein "mix" variable (CP/(bank loans +CP)

    and the share of large bank loans of Jaffee-Modigliani (AER, 1969)
- Security-funded rather than narrowly defined shadow-funded business credit helps internalize hard to measure substitution between directly issued nonfinancial corporate CP and ABS intermediated credit funded with CP and short-run debt securities
  - Much commercial paper (CP) held by money funds, other shadow banks
  - Combines "internal" and "external" shadow banking subsystems of Poznar, et al. (2012), while omitting the gov't sponsored subsystem

Figure 2: Shifts in Narrowly-Defined Shadow Bank Share Partly Reflect Substitution with Commercial Paper Directly Issued by Nonfinancial Corporations



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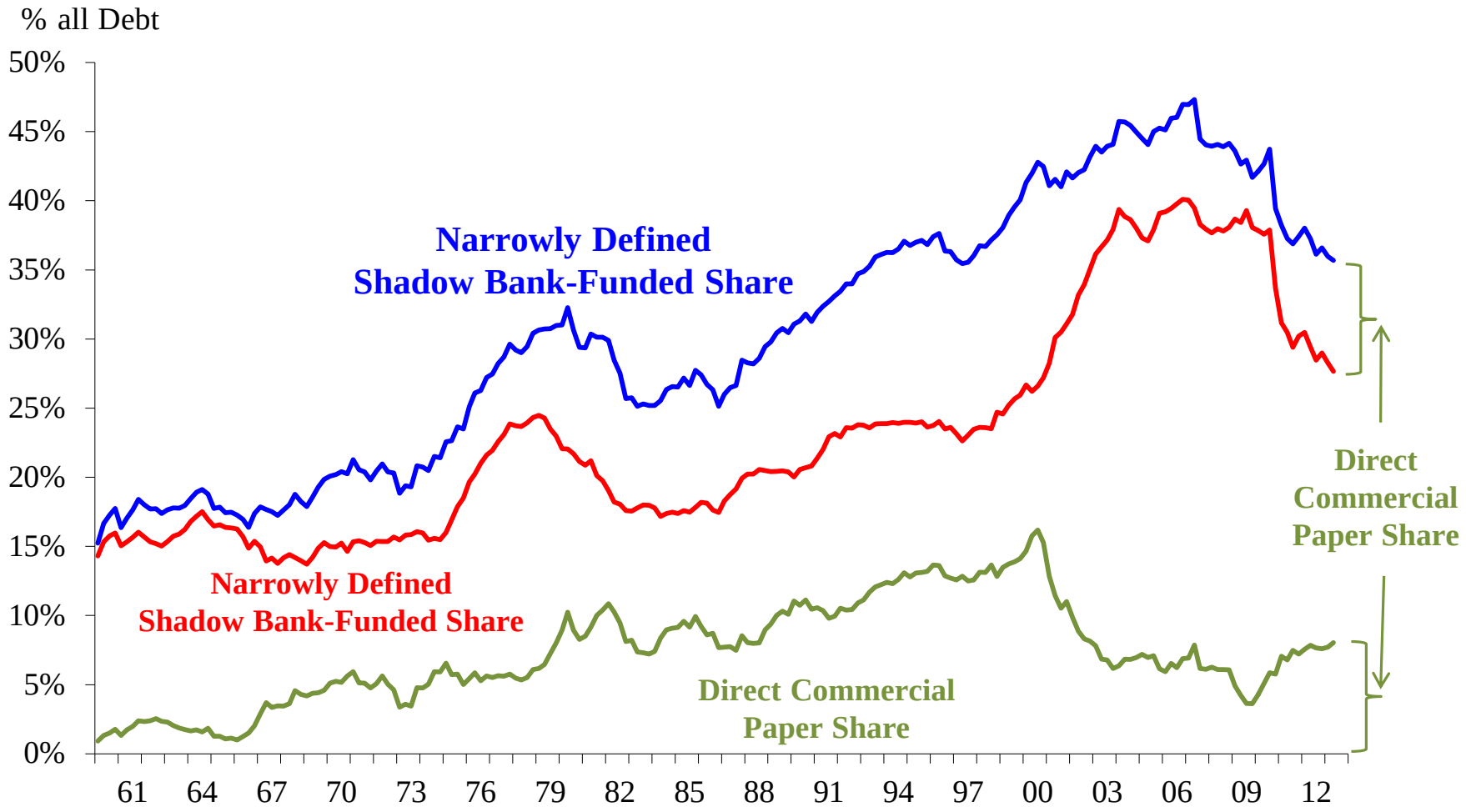

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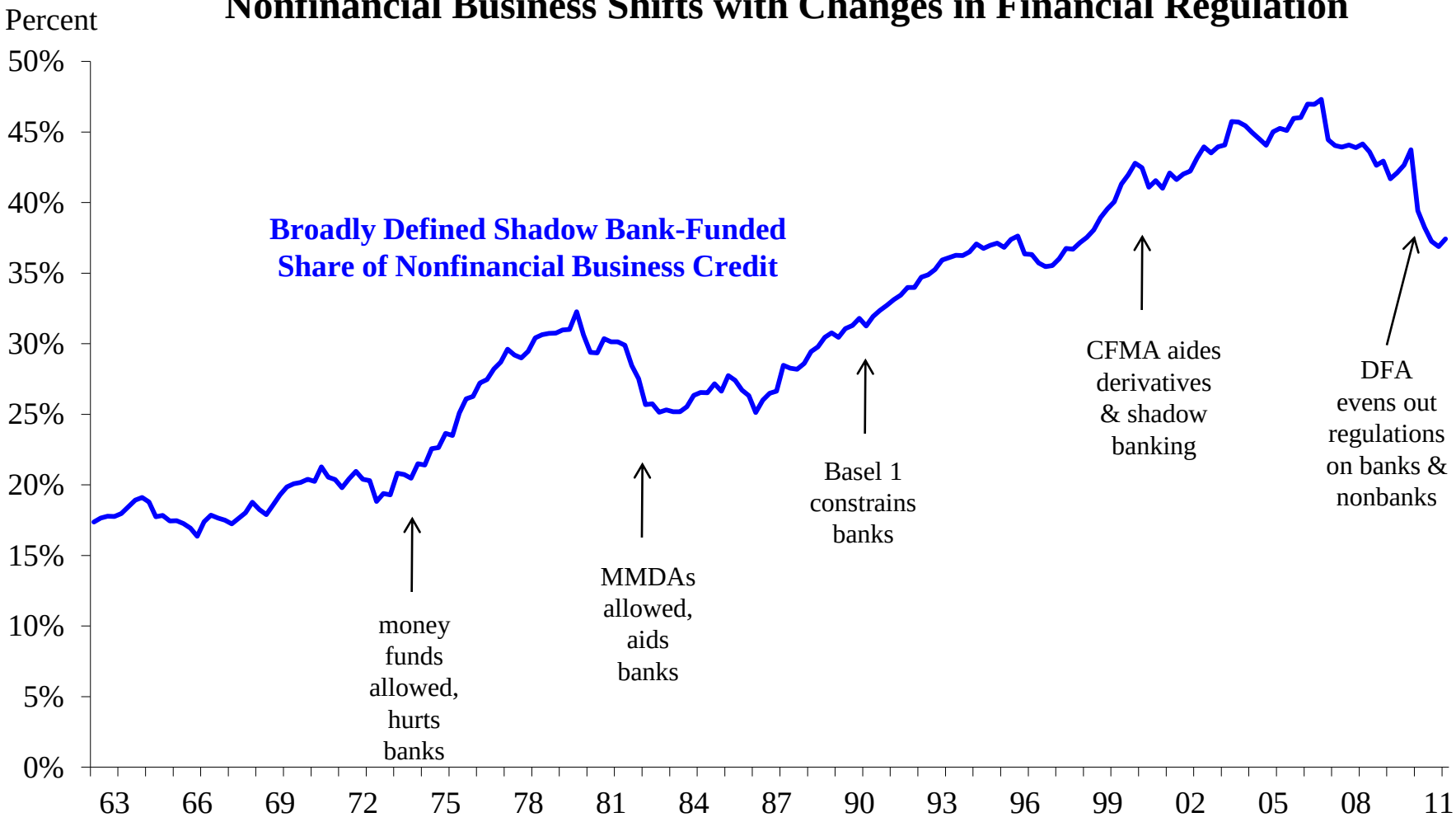
Modelling Strategy

- Security-funded share reflects the impact of factors on the competitiveness of banks vs. (mkt + shadow bank) credit.
- Short-run changes reflect both error-correction of actual to long-run equilibrium, and short-run impact factors
- Flow of Funds 1963- (post early 60's breaks), 73q1 break dummy
- Nonstationary equilibrium l-run share depends on l-run factors:
  - **(+) *Information Costs*** the often neglected "*usual suspect.*" Falling info costs necessary for development of securitization, mutual funds, junk bonds…Ratio of computer & software invest deflator to GDP deflator
  - ***Regulatory Arbitrage*** *usual suspects* of capital standards & other regs.:
    - **(+) *BASELtoDFA*** = 1 from 1989:q4 to 2010:q3 (in model, lagged 1 quarter)
    - (+) ***CFMAtoDFA*** = 1 from 2000:q4 to 2010:q3, fin mkts deregulated then regulated, CFMA fostered credit enhancements used for securitizing credit outside of GSE MBS.
    - **(+) *RRTAX*** the *forgotten usual suspect* of the reserve requirement tax that had encouraged the use of nondeposit funding—(reserve requirements adjusted for use of reservable deposits and the impact of sweep accounts) * (Tbill-IORR)
    - **(+) *MMMFMMDA*** = 1 from 1974:q2 to 1982Q4 between MMMFs permitted by SEC and allowing banks to offer MMDAs in 1982q4. F*orgotten usual suspect* of deregulation
    - No significant evidence of robust money targeting or distinct Basel 1 vs 2 effects

Figure 3: Broadly Defined Shadow Bank-Funded Share of Nonfinancial Business Shifts with Changes in Financial Regulation



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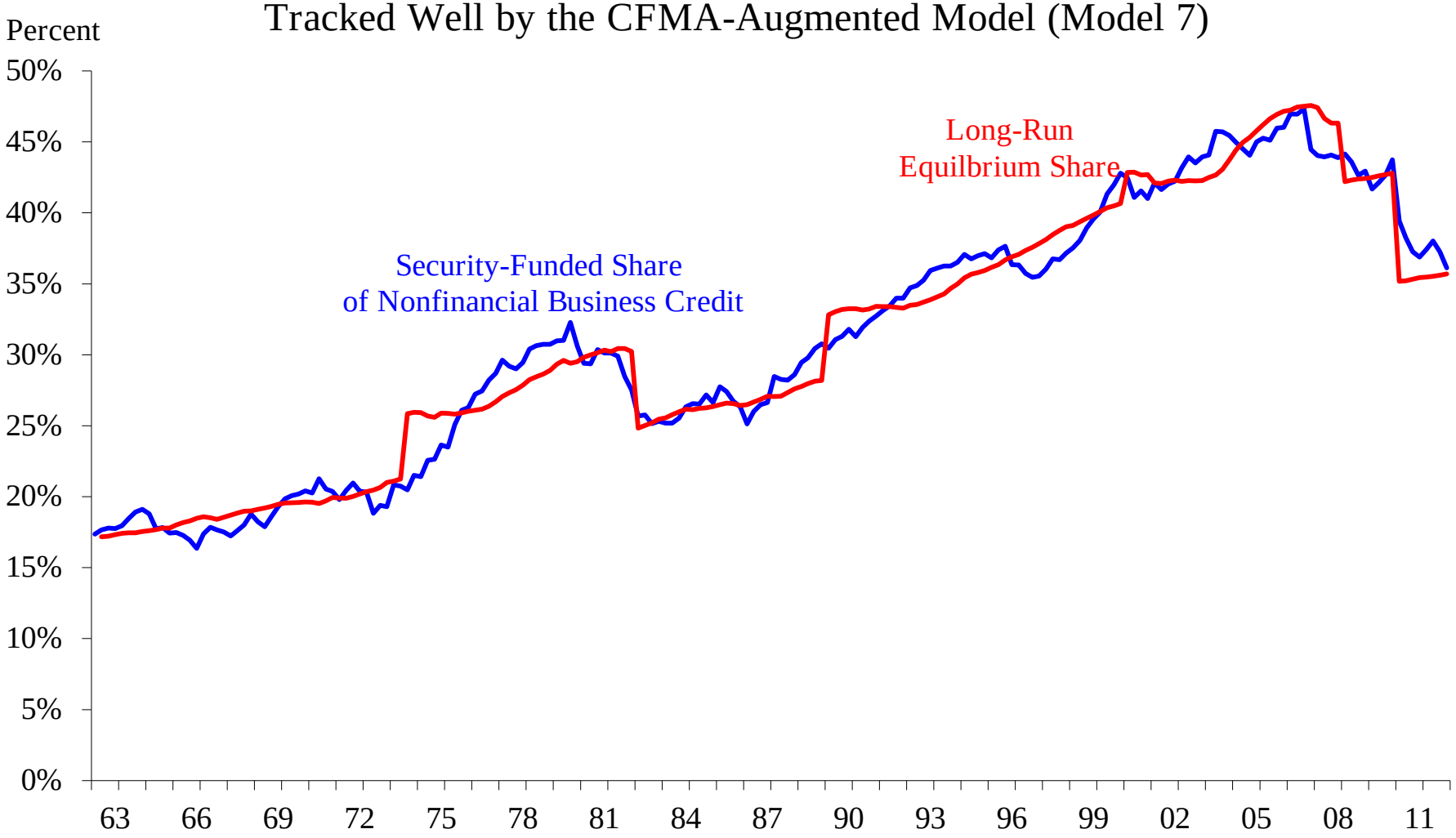
What Drives Security-Funded Short-Run Business Credit in the Long-Run?

- Security-funded share cointegrated with the nonstationary regulatory and information cost variables.
- Signs of long-run effects are as expected:
  - Positive effects of Basel, advent of money funds, reserve req. tax, and CFMA each of which disadvantaged banks vs. nonbank credit sources
  - Negative effects of advent of MMDAs (reversed much of MMMF effect) and of DFA (reversed much of earlier CFMA boost to structure finance)
- Hard to identify stable and significant reserve requirement tax effect—insignificant in samples ending in 2007q2. Other long-run estimated effects are quantitatively and qualitatively similar in pre-crisis and post-crisis full (1963-2012) samples
- Long-run estimated equilibrium relationship lines up nicely with the long-run share. Large roles for regulatory arbitrage and information costs.

Figure 6: Security-Funded Share of Nonfinancial Business Credit Tracked Well by the CFMA-Augmented Model (Model 7)



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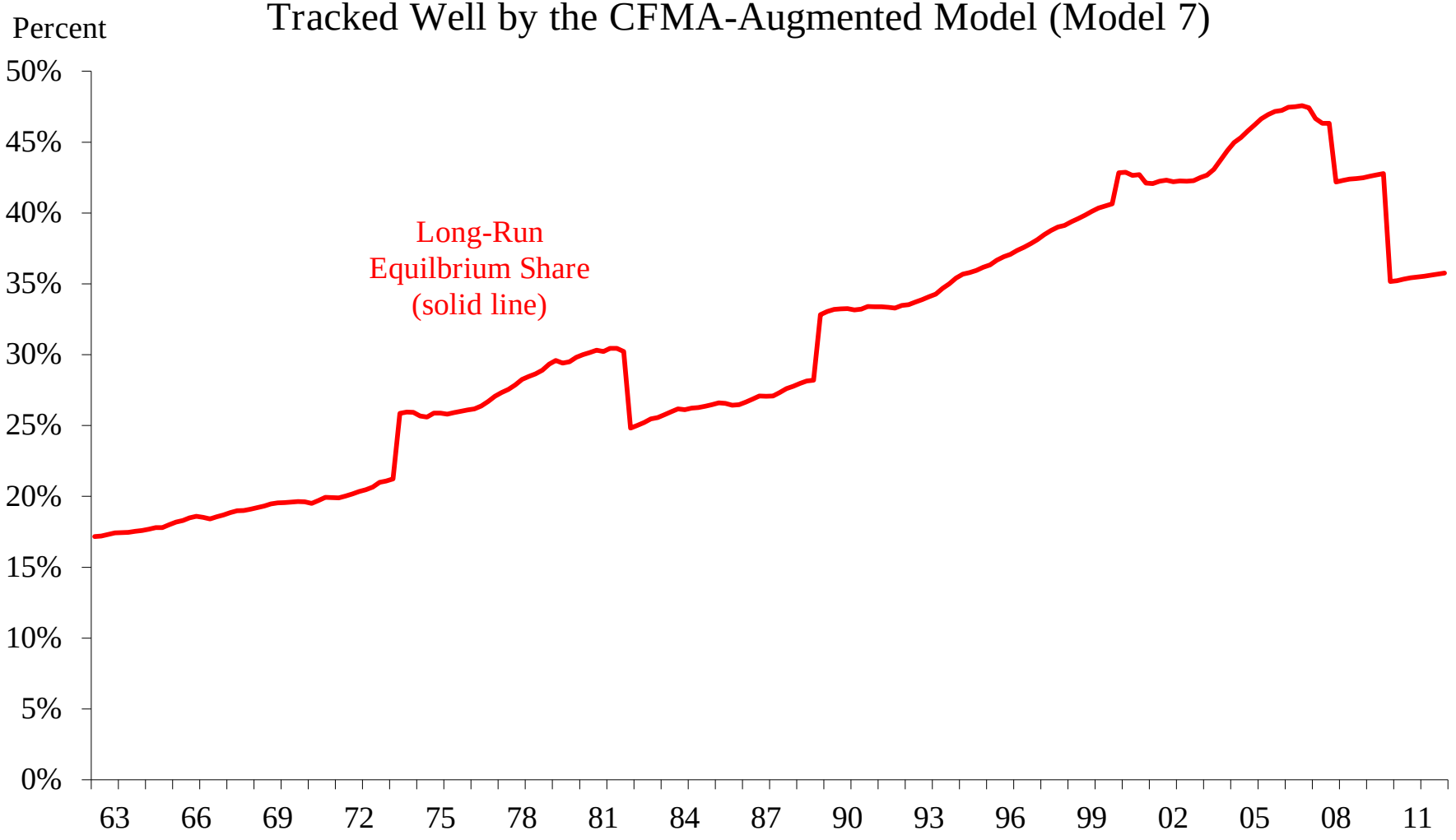

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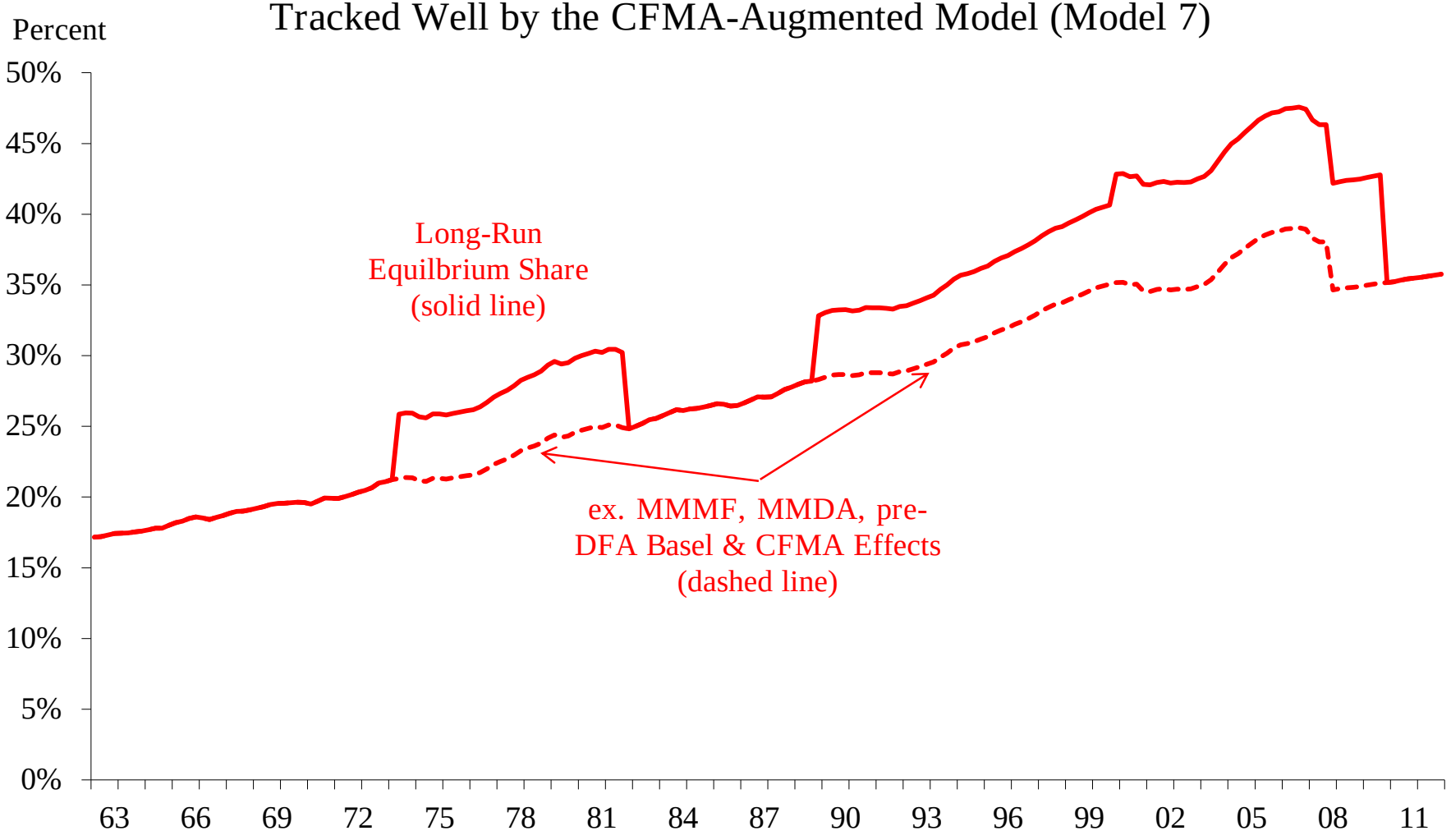

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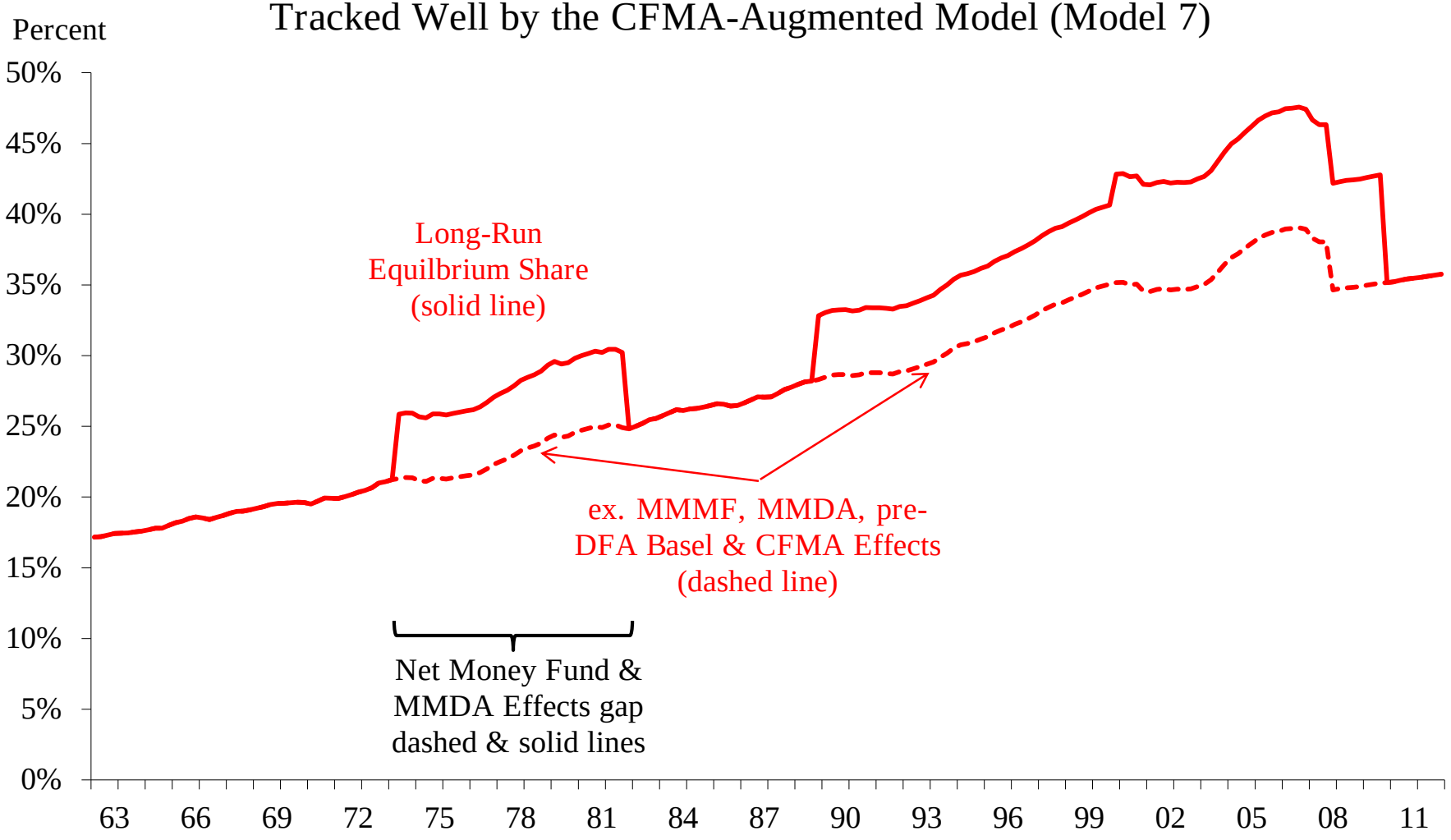

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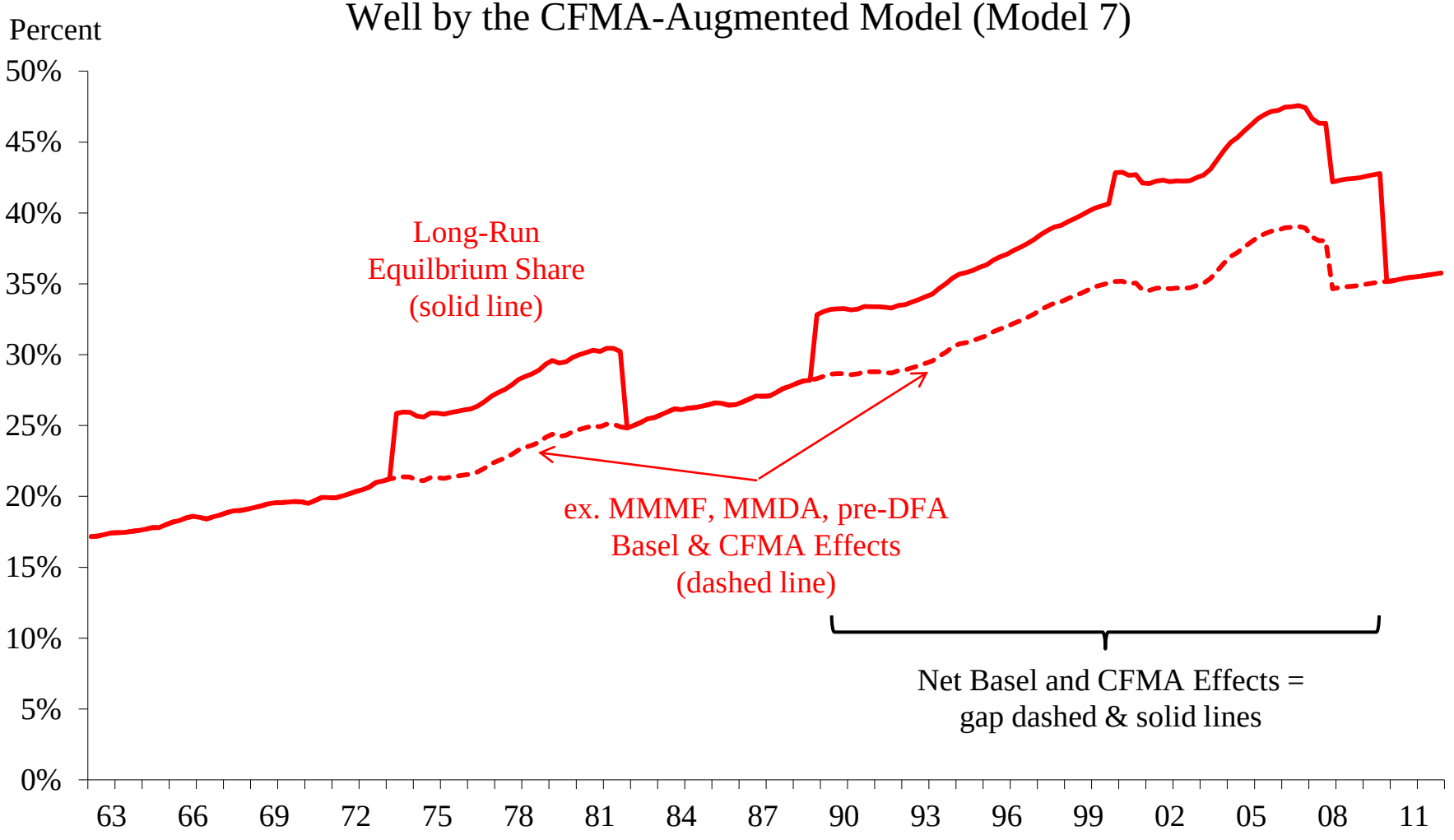

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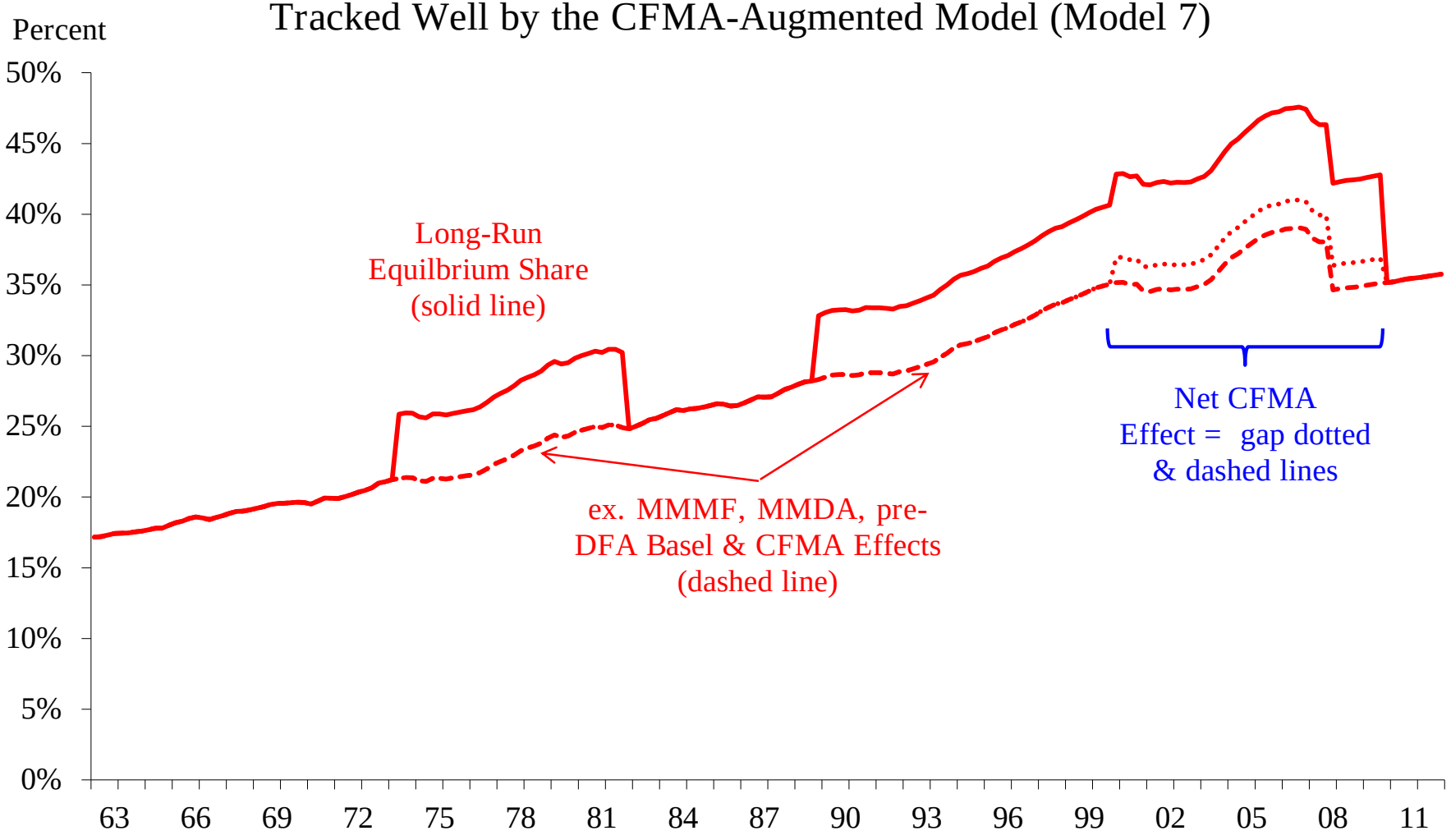

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Modelling Strategy (continued)

- Short-run factors reflect not only lagged changes in the long-run factors listed above, but also one-off events
- Short-run factors altering bank competitiveness relative to nonbank sources
  - (+) ***RegQ*** Bindingness of Regulation Q ceilings on bank deposit interest rates (adjusted for deregulation ala Duca and Wu, *JMCB* 2009)
  - (-) ***LTDDereg*** 1973:q3 lifting of rate ceilings on bank large time deposits
  - (-) Introduction ***MMMFs*** = 1 1974:q3, else 0—impact disintermediation effect when retail money funds permitted
  - (-) Introduction ***MMDAs*** = 1 1982:q4, else 0—reintermediation effect dummy often used to model M2 (Small & Porter, 1989 *FRB Bulletin*)
  - (+) ***DCON*** 1 in 1980:q2, -1 in 1980:q3, else 0 track impact of 1980q2 imposition and 1980q3 lifting of controls on the growth of bank credit
  - (-) Passage of the ***Dodd-Frank*** financial reform act: helps level regulatory playing field between very large banks & nonbank financial firms

Modelling Strategy (continued)

- (+) Forward-looking cyclical factors: ***YieldCurve*** t-3 lag (10 yr Treasury-fed funds); perhaps 2 non-mutually exclusive factors:
  - Steep yield curve often reflects expectation of an improving economy with less downside risk, more risk tolerance or more risk taking.
  - Might partly also reflect "search for yield" effects since the yield curve is typically steep when the federal funds rate is very low
- Short-run flight-to-quality factors:
  - (-) ***PennCentral*** = 1 in 1970:q2, -1 in 1970:q3, 0 otherwise control for Penn Central commercial paper default which had induced a short-lived flight-to-quality in securities markets that rapidly unwound.
  - (-) ***1987StockCrash*** = 1 in 87:q4, -1 in 88:q1, 0 otherwise captured sharp, but short-lived flight-to-quality and its rapid unwinding.
  - (-) ***AUG07*** = 1 07q3 redemption freeze at 3 subprime exposed hedge funds triggers turmoil & higher costs in the open-market paper market

Concluding Comments

- Consistent with factors stressed by older studies*, shadow banking's role in short-term business finance is affected in
  - Long-run by (+) information costs, (+) reserve requirement taxes, and bank capital regulation (+)
  - Short-run by (+) Regulation Q disintermediation, (-) deposit deregulation, and (-) curbs on bank lending
- Consistent with post-millennium studies**, shadow banking's role in short-term business credit is *<u>also</u>* affected in the
  - Long-run by (+) nonbank financial deregulation aiding structured finance—CFMA, and (-) nonbank financial regulation—e.g., DFA
  - Short-run by (+) pro-cyclical risk-taking (yield curve effects), (+) risk-taking with derivatives/structured finance, and (-) financial market event risk and flights to quality

* e.g., Edwards and Miskin (1995); Pennacchi (1988); *inter alia*

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In summary, there is much to be gained by synthesizing roles for information costs, financial regulation, and financial innovation in analyzing the evolution of shadow banking over the last half century.

Shortened List of References

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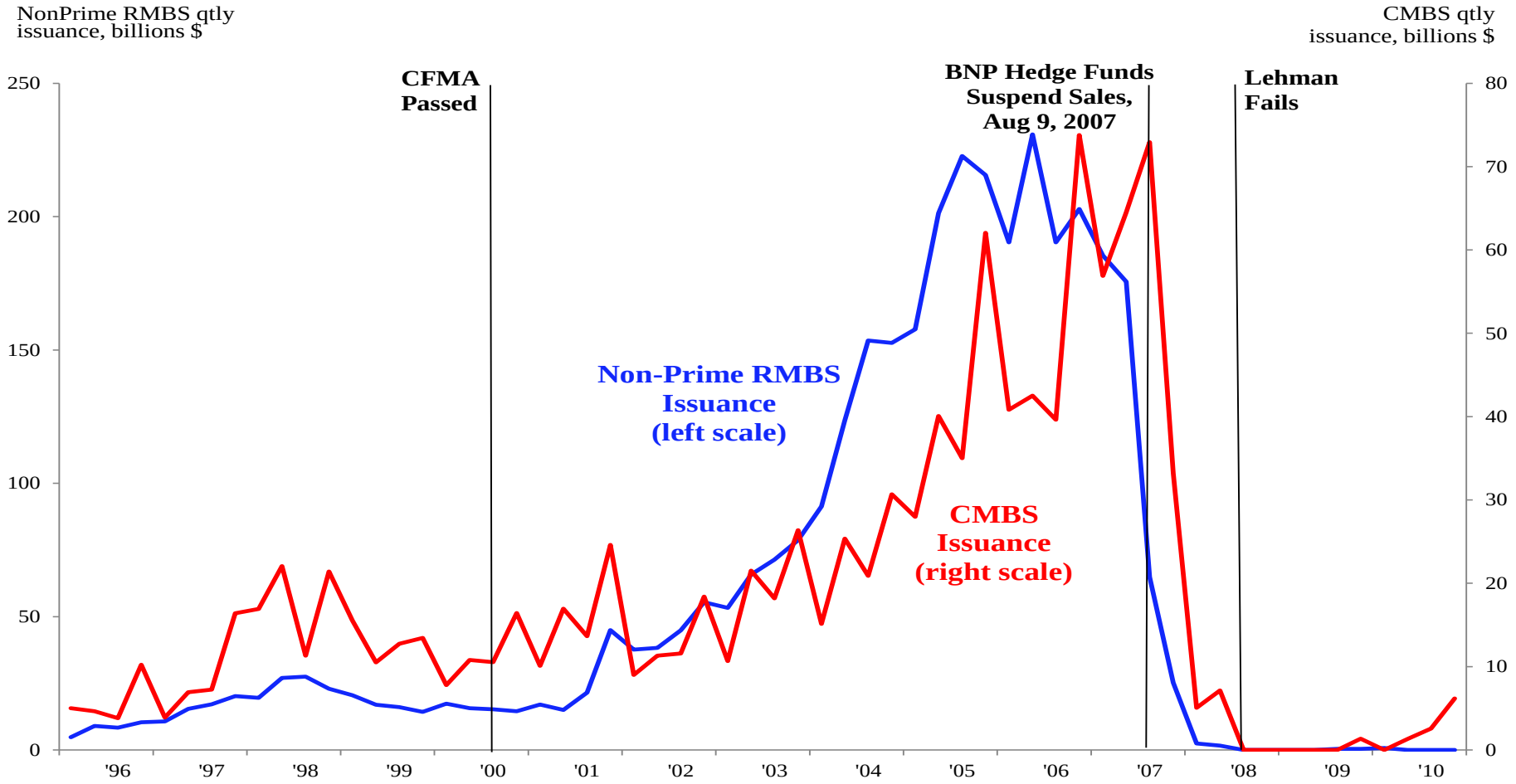
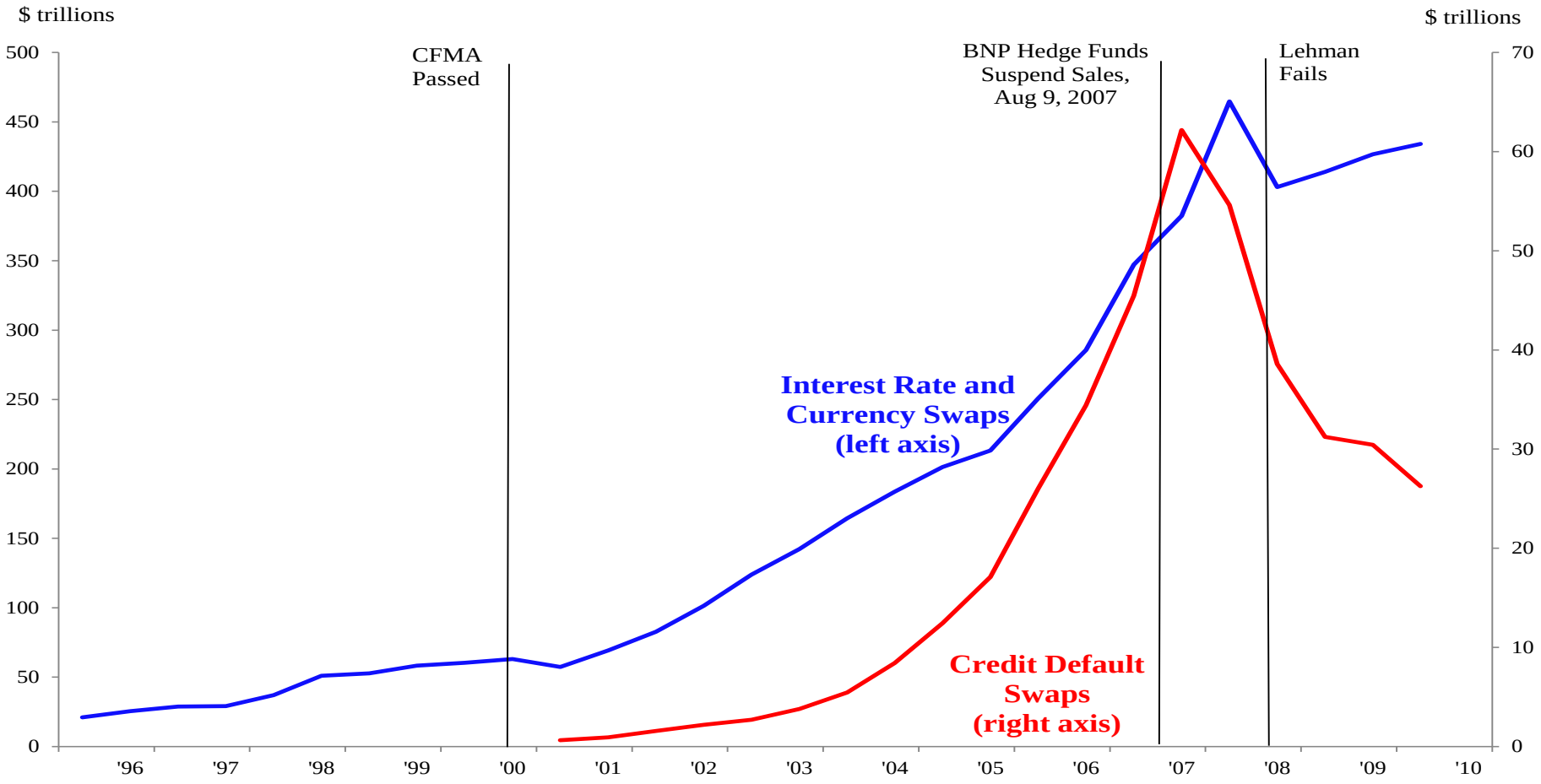
Back-up Slides on CFMA, Non-GSE MBS Issuance, and Derivatives

Fig. 2: Real Non-Prime RMBS and CMBS Issuance Surge in mid-2000s and plunge in 2007-08



Sources: Inside Mortgage Finance, CMSA, and Duca, John V., John Muellbauer and Anthony Murphy (2013), "Shifting Credit Standards and the Boom and Bust in U.S. House Prices: Time Series Evidence from the Past Three Decades." August 2013.

Fig. 3: Notional Derivatives Surge after Passage of 2000 Commodity Futures Modernization Act (CFMA), CDS's Plunge Since 2007



Sources: ISDA Market Survey and Duca, John V., John Muellbauer and Anthony Murphy (2013), "Shifting Credit Standards and the Boom and Bust in U.S. House Prices: Time Series Evidence from the Past Three Decades." August 2013. Data are adjusted for double-counting. Notional amounts of derivatives contracts outstanding.