The Big Short, Part II

***Rob Anderson**, Chief Actuary, United Auto Ins. Co.*

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Live Survey Question

(CAS Events App, click on this session, click on Live Poll)

What was the primary cause of the 2008 financial crisis?

a) *Irrational exuberance within the housing sector, artificially inflating prices*
b) *A liquidity fracture in the global monetary system*
c) *Mass defaults in sub-prime mortgages*
d) *Proliferation of credit default swaps*
e) *Taking Fannie Mae & Freddie Mac into receivership*

Learning Objectives

- 1) Understand *fundamentally* the primary cause of financial crises
- 2) Recognize a major economic problem we face in 2019
- 3) Learn of another, and systemic, problem in the global monetary system
- 4) Identify current events related to this monetary problem
- 5) Discuss how these two risks might impact the insurance industry
- 6) Ideas for risk management strategies

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Why did the 2008 financial crisis happen?

The Risk Management Paradox

- Risk management is a rational thinking approach to understanding relative risk
- Risk management was born out of the fact that humans don't typically approach risk rationally and often misunderstand relative risk.
- Risk management professionals are humans

The solution to the paradox

To be a successful risk manager you must first become a successful critical (or rational) thinker.

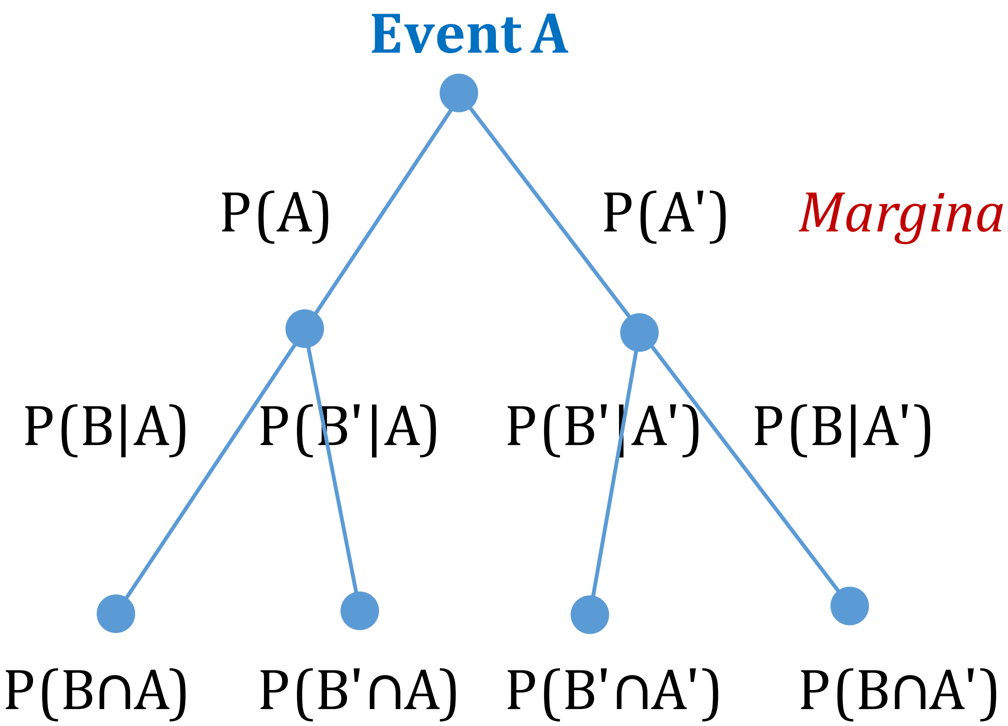
The fundamental cause of financial crises

- **Parameter Error** – the uncertainty in the parameters used to model a certain phenomenon

- **Model Error** – the uncertainty in the performance of a chosen model to properly quantify a certain phenomenon

Bayes' Theorem – the foundation for critical thinking

Bayesian reasoning is the critical thinking process of how to change your mind when you learn new info about the world around you or have new experiences or encounter new evidence.



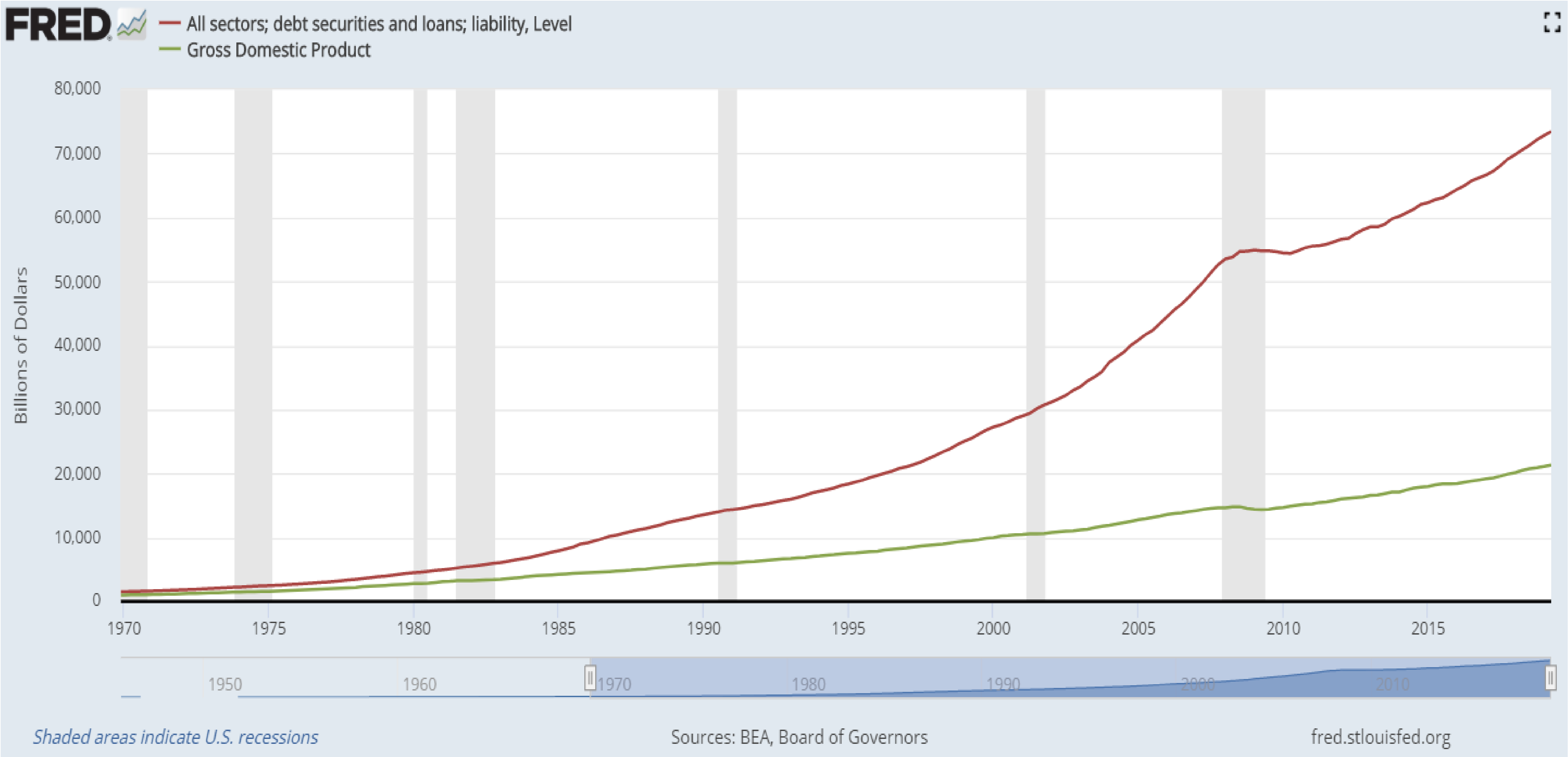
Marginal Probabilities

Conditional Probabilities

Event B *likelihoods given* Event A

Joint Probabilities

US Debt to GDP



On the Horizon – a global debt crisis

at the household, corporate, and sovereign levels

There are only two ways (for households and corporations) and two additional ways (for a sovereign) to deleverage from a debt problem:

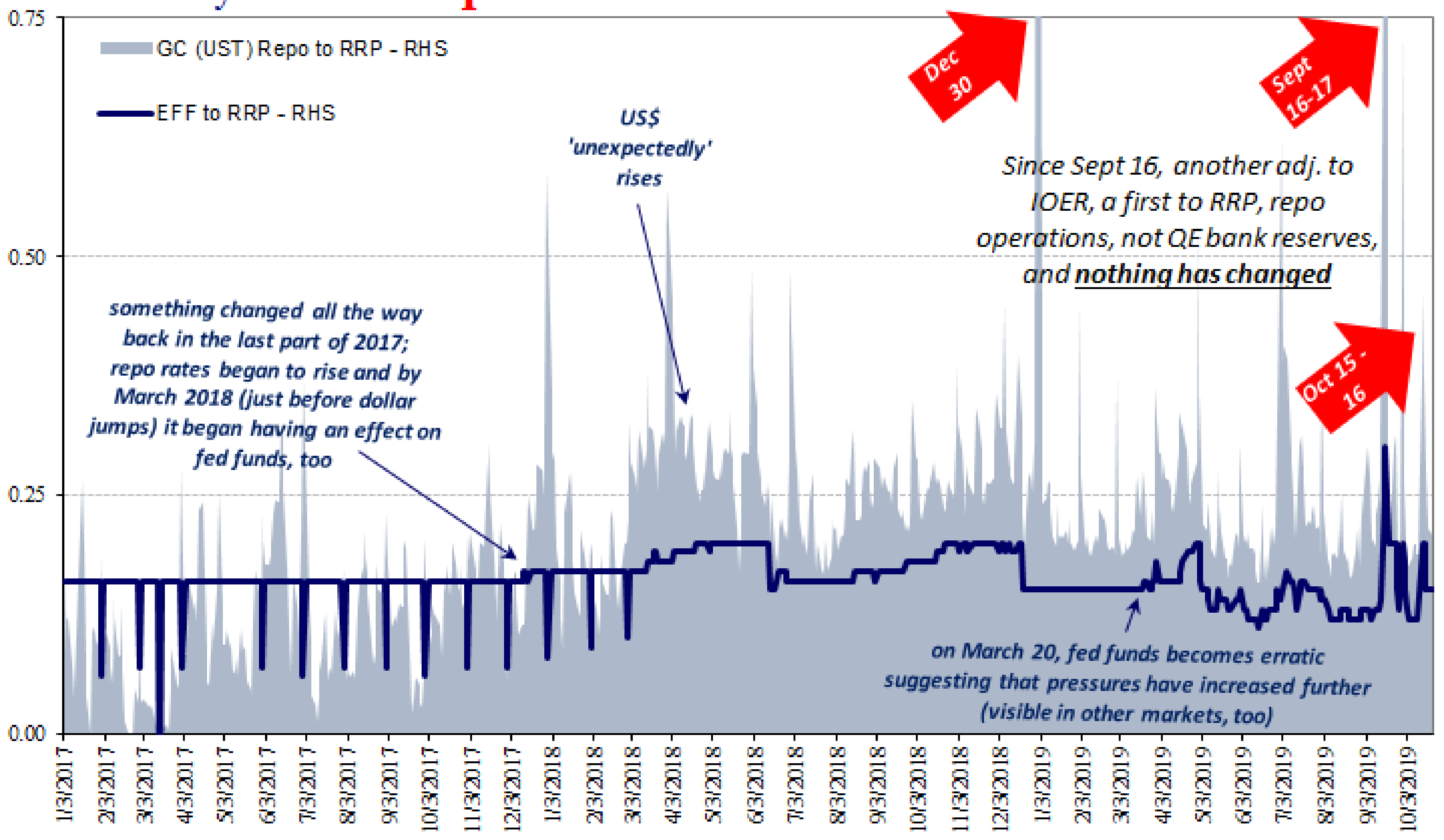
1) **Pay off the debt** ☒

2) **Default on the debt** ☑

3) **Socialize the debt** ?

4) **Devalue the debt** ☒

Money Markets Equivalents



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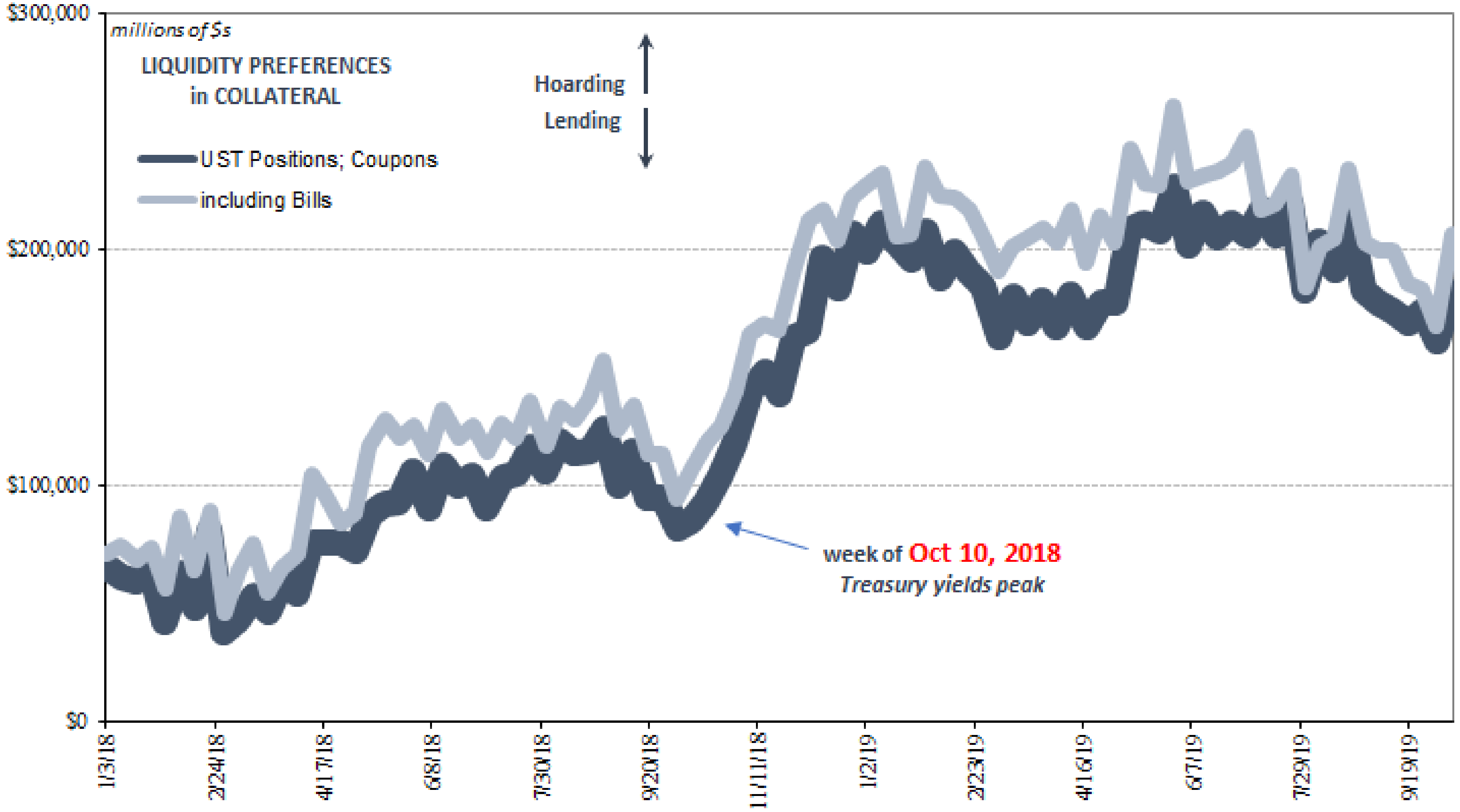
Primary Dealers Net UST Positions (excl. TIPS)



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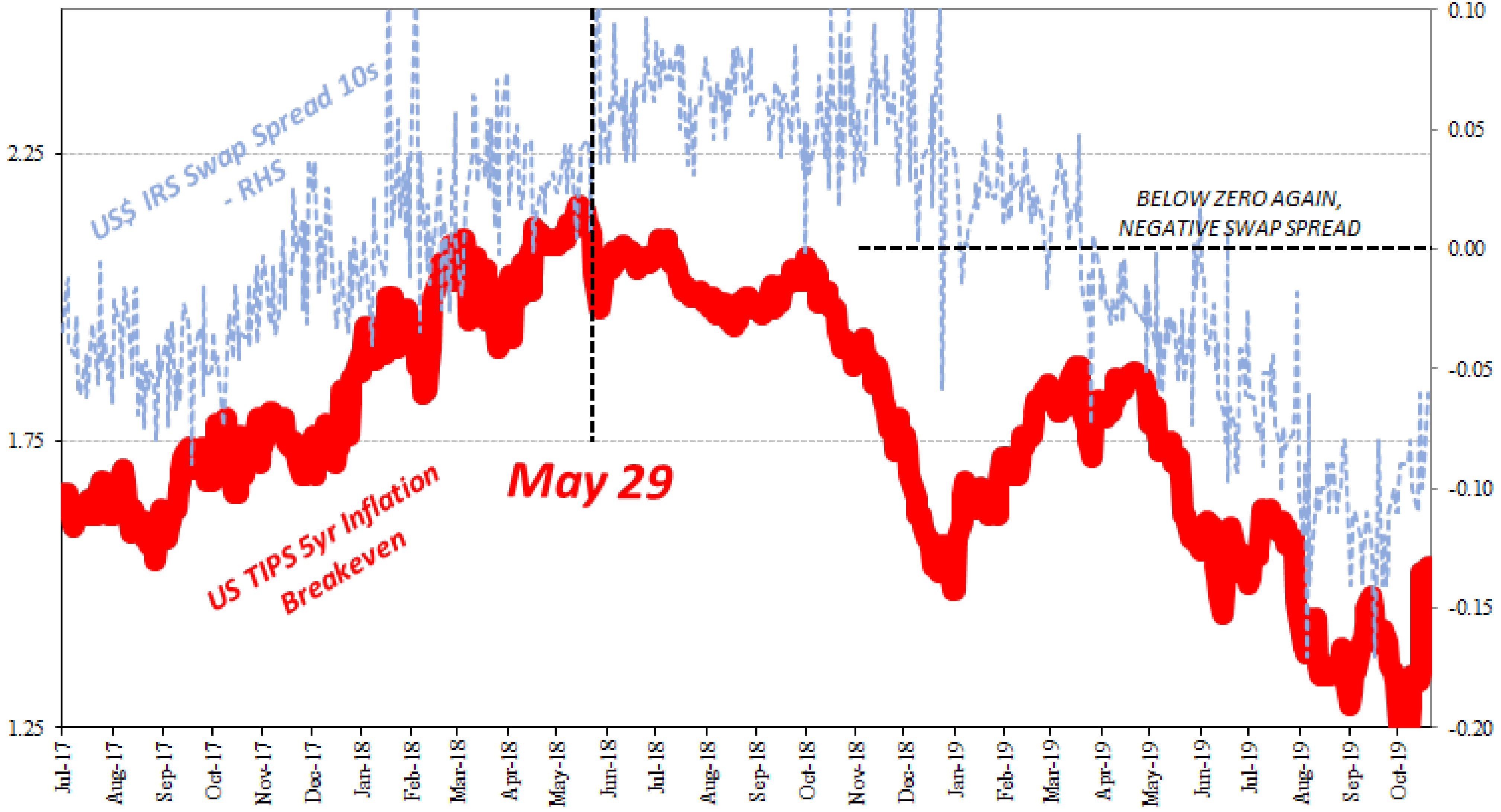
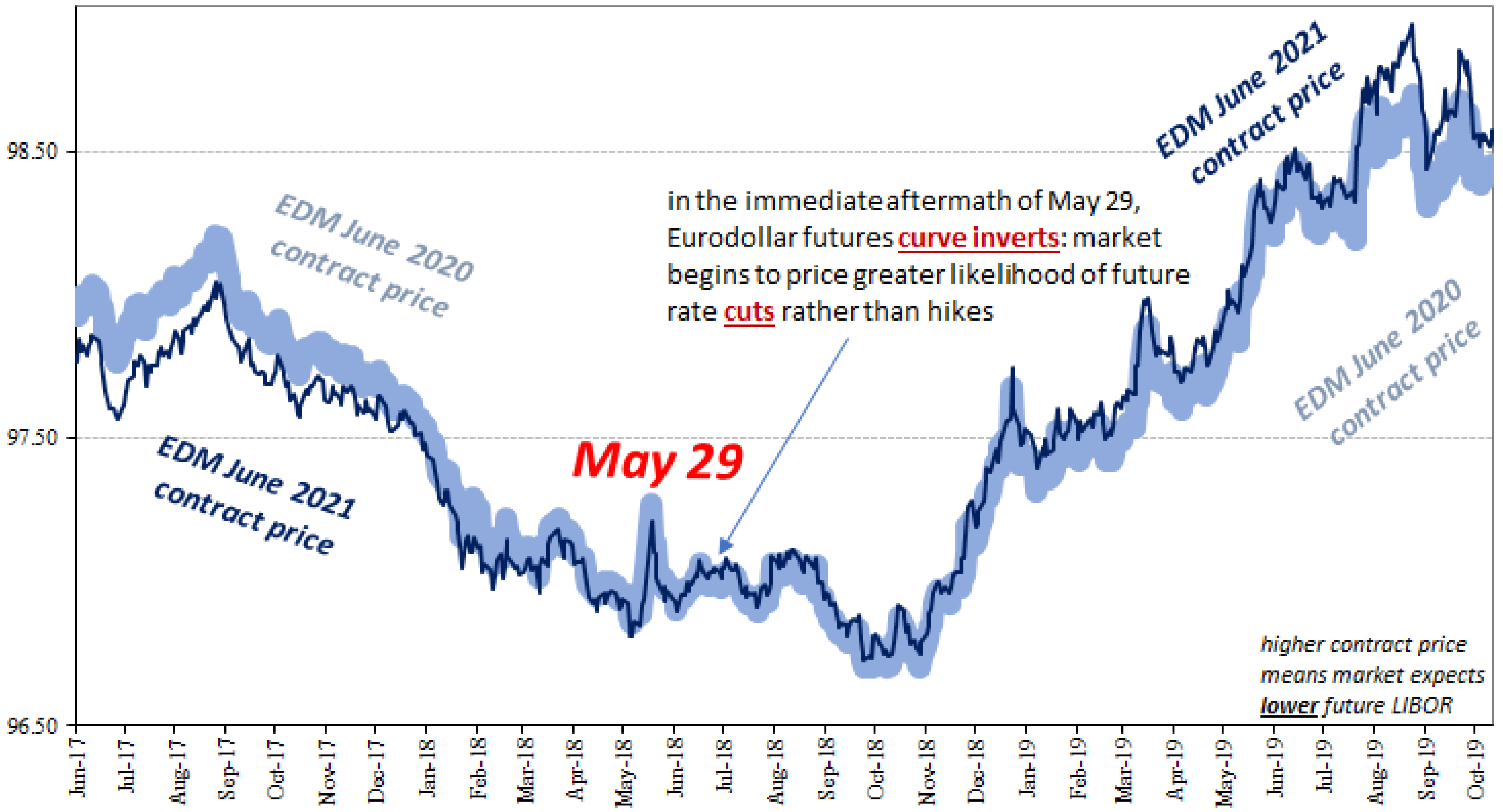
US Treasury Market; US$ Interest Rate Swaps



Eurodollar Futures Curve



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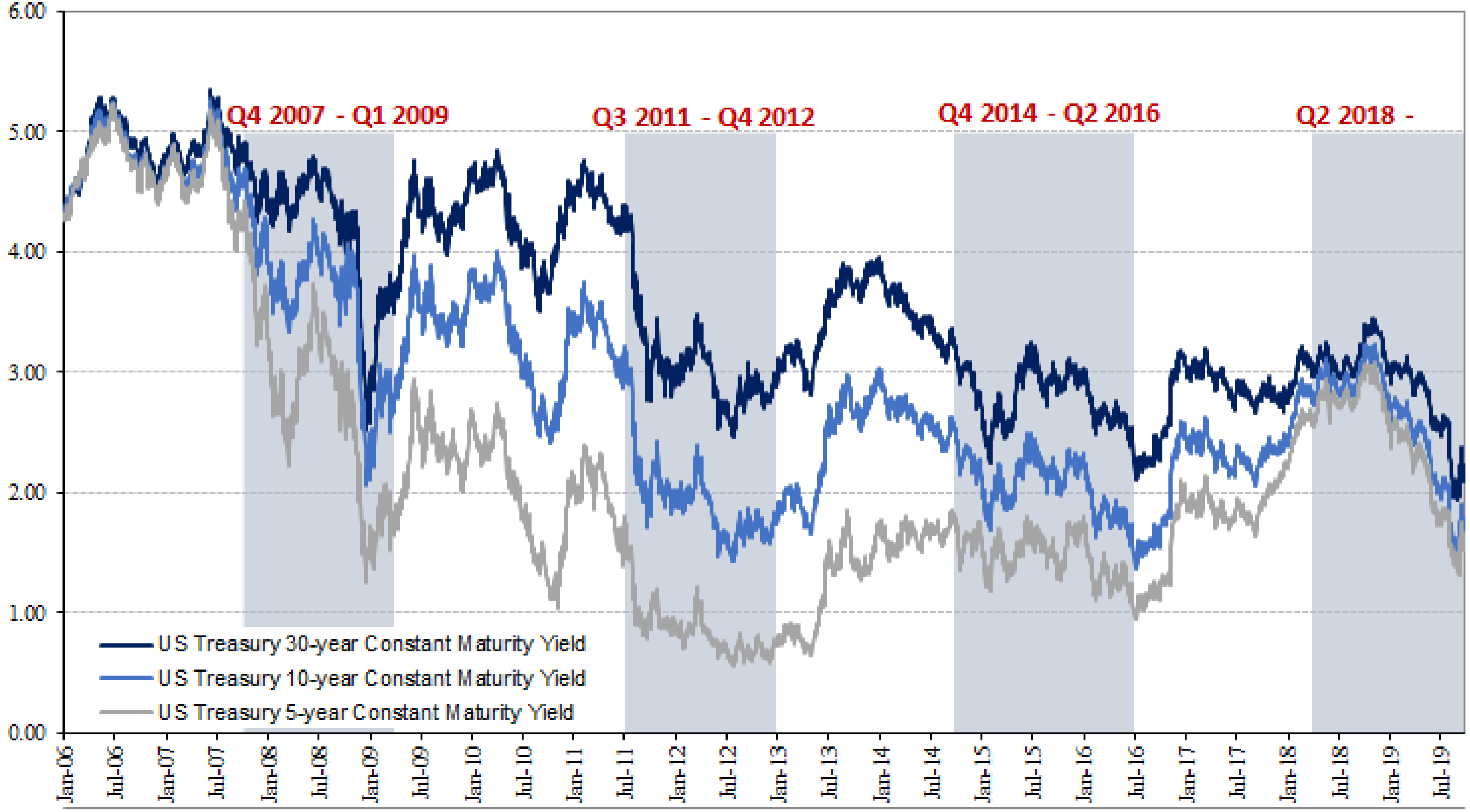
Flight to Liquidity: US Treasury Yields



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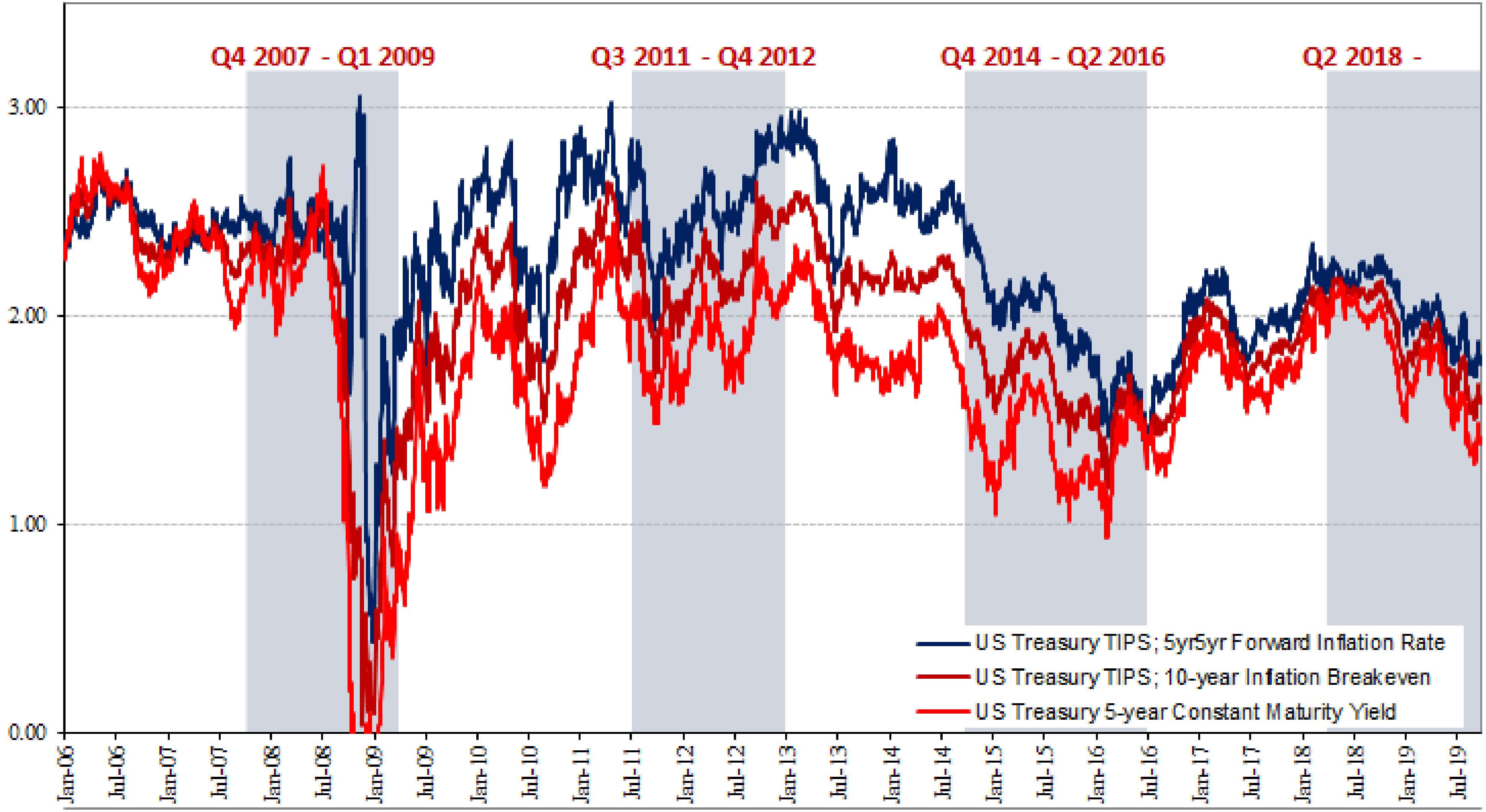
Flight to Liquidity: US Treasury TIPS



Flight to Liquidity: Euro$ Futures

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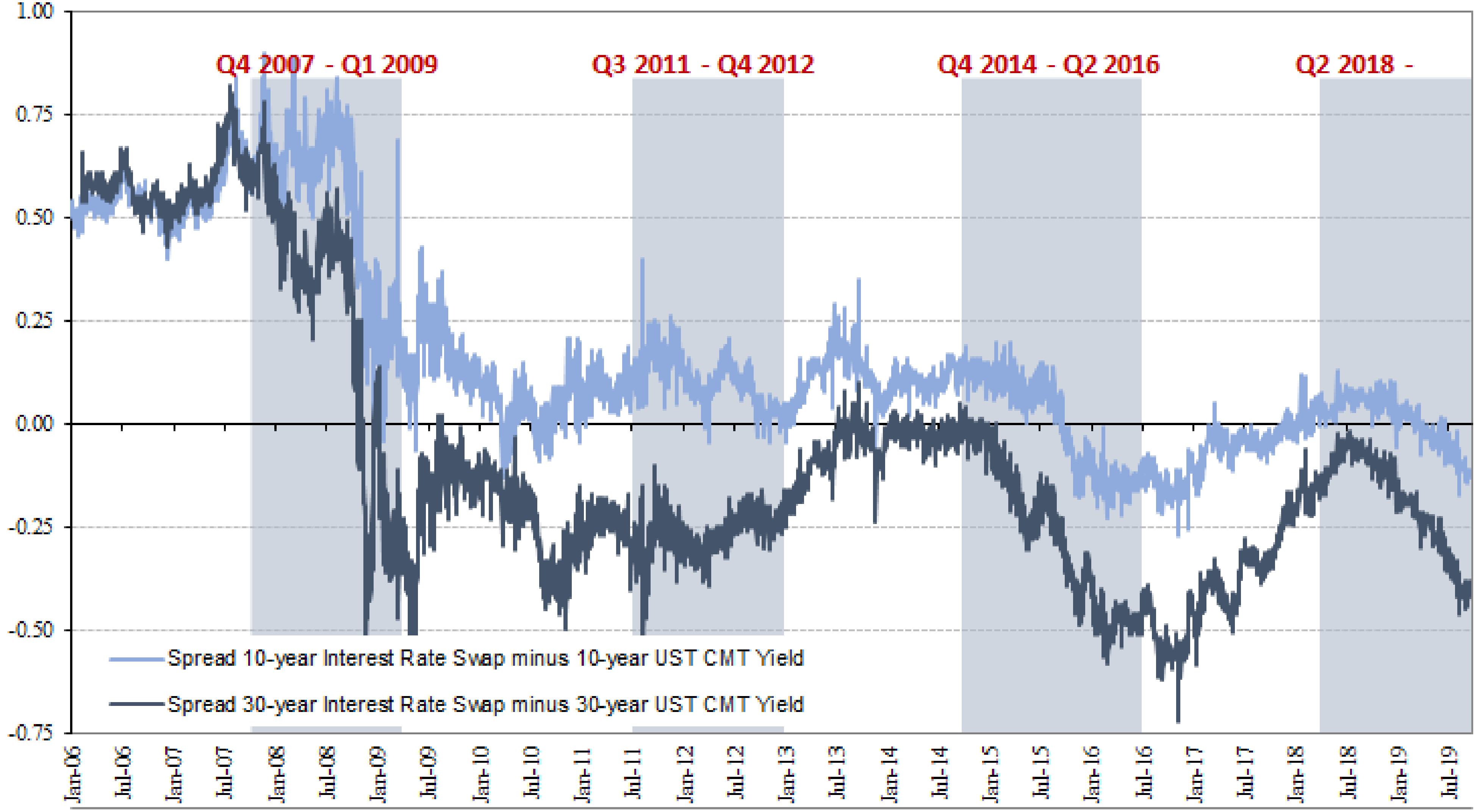
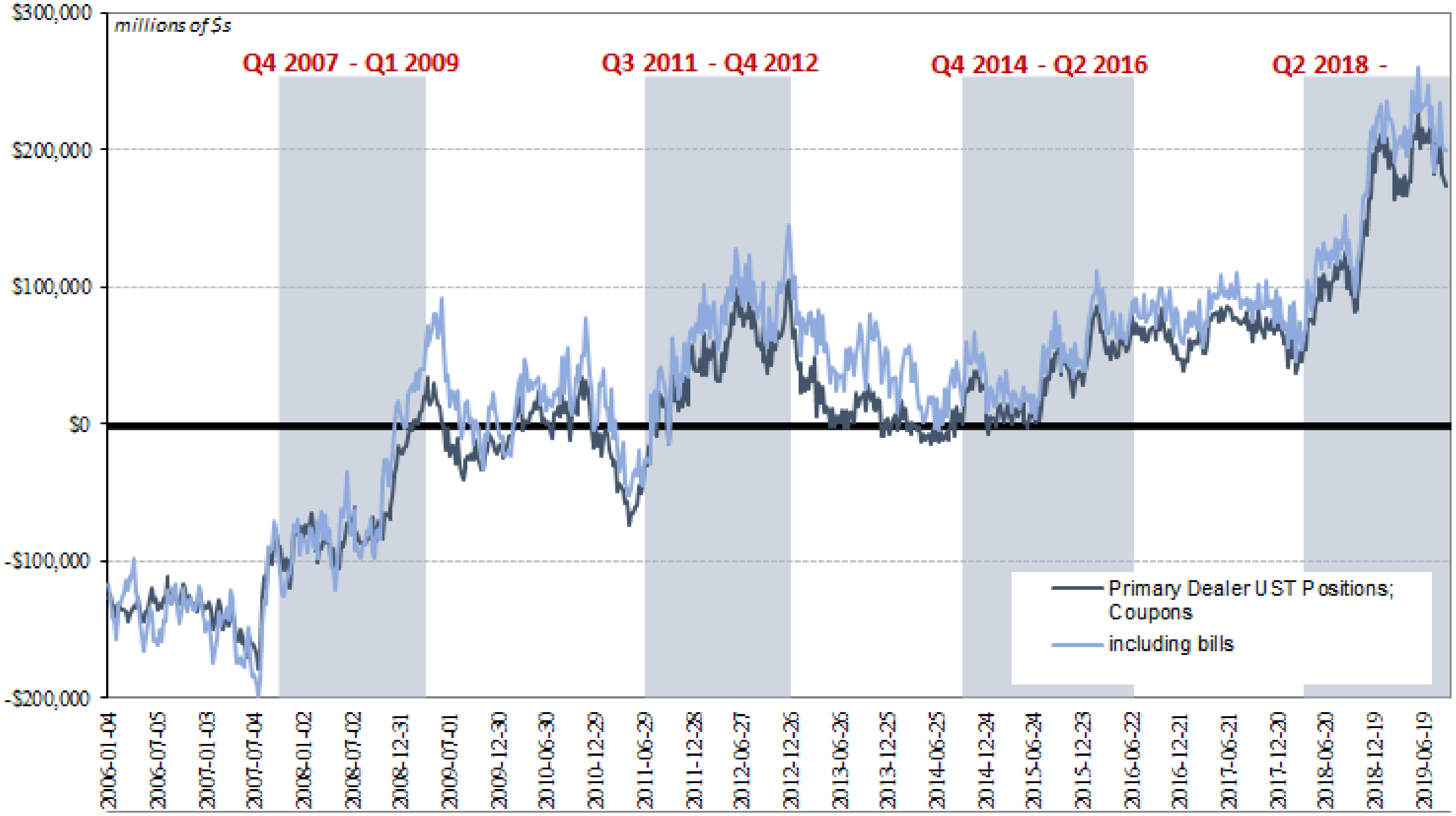
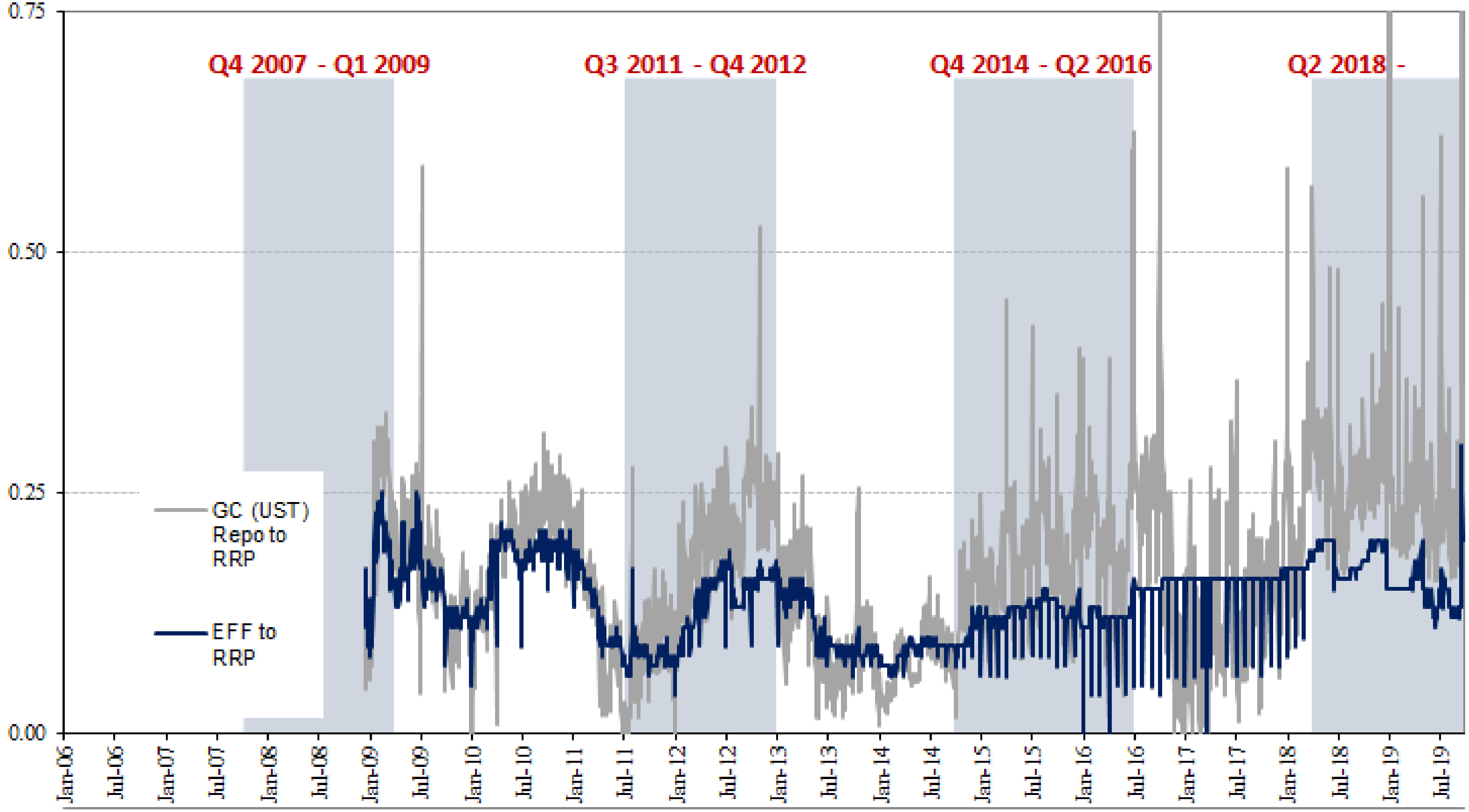
Flight to Liquidity: US$ IRS



Flight to Liquidity: Primary Dealer UST Positioning (net)



Flight to Liquidity: US$ Money Markets



Missing shadow Money

> "Prospective **subprime losses were clearly not large enough on their own to account for the magnitude of the crisis**. Rather, the system's vulnerabilities, together with gaps in the government's crisis-response toolkit, were the principal explanations of why the crisis was so severe and had such devastating effects on the broader economy.

Ben Bernanke
Chairman, Federal Reserve
Testimony to the Financial Crisis Inquiry Commission

CONCLUSIONS OF THE
FINANCIAL CRISIS INQUIRY COMMISSION

The Financial Crisis Inquiry Commission has been called upon to examine the financial and economic crisis that has gripped our country and explain its causes to the American people. We are keenly aware of the significance of our charge, given the economic damage that America has suffered in the wake of the greatest financial crisis since the Great Depression.

Our task was first to determine what happened and how it happened so that we could understand why it happened. Here we present our conclusions. We encourage the American people to join us in making their own assessments based on the evidence gathered in our inquiry. If we do not learn from history, we are unlikely to fully recover from it. Some on Wall Street and in Washington with a stake in the status quo may be tempted to wipe from memory the events of this crisis, or to suggest that no one could have foreseen or prevented them. This report endeavors to expose the facts, identify responsibility, unravel myths, and help us understand how the crisis could have been avoided. It is an attempt to record history, not to rewrite it, nor allow it to be rewritten.

To help our fellow citizens better understand this crisis and its causes, we also present specific conclusions at the end of chapters in Parts III, IV, and V of this report.

The subject of this report is of no small consequence to this nation. The profound events of 2007 and 2008 were neither bumps in the road nor an accentuated dip in the financial and business cycles we have come to expect in a free market economic system. This was a fundamental disruption—a financial upheaval, if you will—that wreaked havoc in communities and neighborhoods across this country.

As this report goes to print, there are more than 26 million Americans who are out of work, cannot find full-time work, or have given up looking for work. About four million families have lost their homes to foreclosure and another four and a half million have slipped into the foreclosure process or are seriously behind on their mortgage payments. Nearly $11 trillion in household wealth has vanished, with retirement accounts and life savings swept away. Businesses, large and small, have felt

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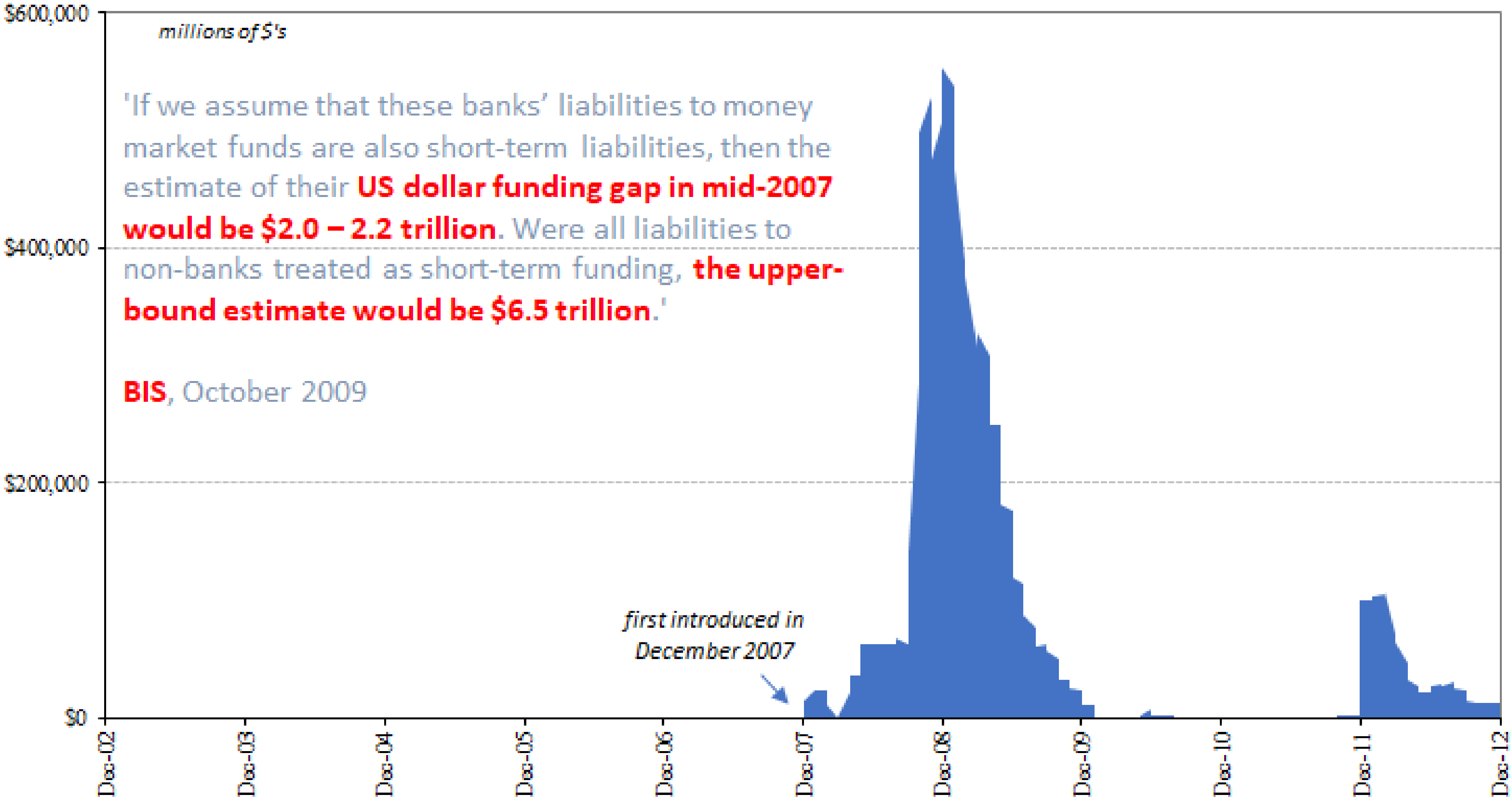
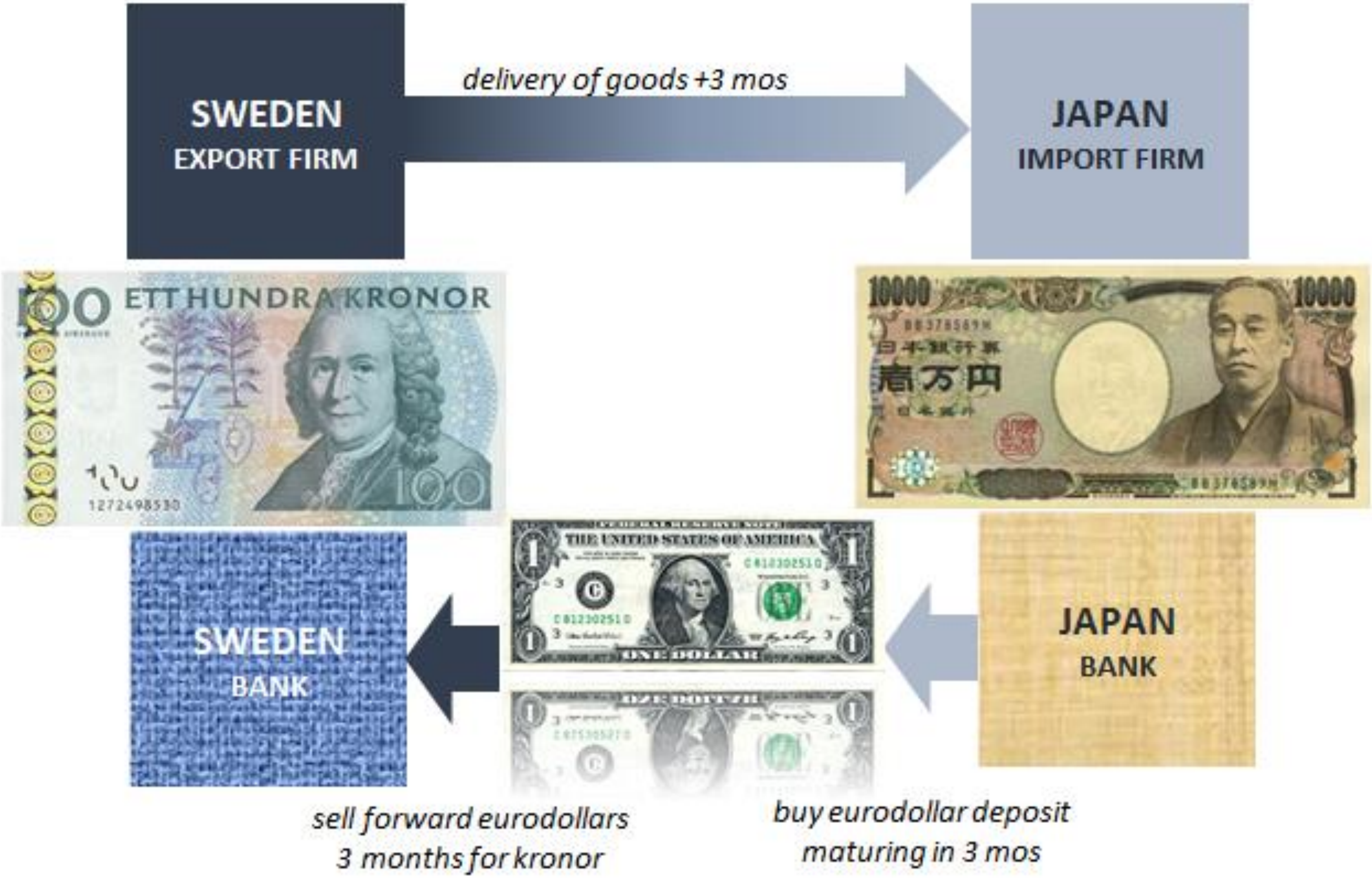
Federal Reserve; Assets; Central Bank Liquidity Swaps




SWEDEN
EXPORT FIRM
delivery of goods +3 mos
JAPAN
IMPORT FIRM
ETT HUNDRA KRONOR
SWEDEN
BANK
THE UNITED STATES OF AMERICA
ONE DOLLAR
JAPAN
BANK
sell forward eurodollars
3 months for kronor
buy eurodollar deposit
maturing in 3 mos

EURODOLLAR MARKET

citi
MUFG
Bank of Tokyo-Mitsubishi UFJ
Deutsche Bank
HSBC

ROBERT SOLOMON'S 3 PILLARS OF A GLOBAL RESERVE CURRENCY

1. **LIQUIDITY** – AS LONG AS BANKS ARE WILLING TO EXPAND, AMPLE SUPPLY OF FUNGIBLE 'CURRENCY' IN THE FORM OF BANK LIABILITIES
2. **ADJUSTMENT** – SINCE "CURRENCY" IS FUNGIBLE, THE SYSTEM CAN FLEX TO INCORPORATE MODERN ADVANCES, IF NOT LEAD THEM
3. **CONFIDENCE** – DENOMINATED IN DOLLARS

Missing shadow Money

MEMORANDUM OF DISCUSSION

A meeting of the Federal Open Market Committee was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C., on Monday and Tuesday, December 16-17, 1974, beginning at 4:00 p.m. on Monday.

PRESENT: Mr. Burns, Chairman
Mr. Hayes, Vice Chairman
Mr. Black
Mr. Bucher
Mr. Clay
Mr. Coldwell
Mr. Holland
Mr. Kimbrel
Mr. Mitchell
Mr. Sheehan
Mr. Wallich
Mr. Winn

Messrs. Baughman, MacLaury, Mayo, and Morris, Alternate Members of the Federal Open Market Committee

Messrs. Eastburn, Francis, and Balles, Presidents of the Federal Reserve Banks of Philadelphia, St. Louis, and San Francisco, respectively

Mr. Broida, Secretary
Mr. Altmann, Deputy Secretary
Mr. O'Connell, General Counsel
Mr. Partee, Senior Economist
Mr. Axilrod, Economist (Domestic Finance)
Mr. Solomon, Economist (International Finance)

“ In reply, Mr. Coombs said an effort could be made to develop such a measure, but he doubted that it would be successful. The volume of funds which might be shifted back and forth between the of the monetary statistics **arose in connection with Euro-dollars**; **he suspected that at least some part of the Euro-dollar-based money supply should be included in the U.S. money supply**. More generally, he thought **M1 was becoming increasingly obsolete as a monetary indicator. The Committee should be focusing more on M2, and it should be moving toward some new version of M3**--especially because of the participation of nonbank thrift institutions in money transfer activities.

FOMC
Memorandum of Discussion
December 1974

Missing shadow Money

Exchange Rate Arrangements in the Eighties

Robert V. Roosa*

Literally dozens of international conferences have been convened already in the decade of the eighties to deplore "the failure of Bretton Woods" and to call for bold new reforms. It seems to me a calumny, though, to attribute failure to either of the Bretton Woods institutions, or to any of the supplemental facilities added to their scope over the past 40 years. The only trace of failure is to be found in that one segment of the international financial system that has been assigned to me for this symposium—exchange rate arrangements. And I am going to suggest that even the system of par value exchange rates envisaged here on Mt. Washington in 1944, and broadly realized across the world by 1958, only broke down in the early seventies because it had already by that time successfully promoted a remarkable diversity of growth in the incomes and trade of the principal participating countries. What is more, an increasing number of participants in the international markets for money and goods, after living with the resulting nonsystem of floating exchange rates for over a decade, are beginning to yearn for the comparative orderliness and stability which their idealized memories associate with "the days of Bretton Woods."

My own view is that for the rest of the eighties, and no doubt for even longer, the preoccupation of most of the world, so far as exchange rate matters are concerned, will be in finding ways back to the objectives—though

"But this combination of improvisations could not cope with, and indeed may have contributed to, the enormous expansion in markets for U.S. dollars offshore, and the **new networks of interbank relations that made possible the creation of additional supplies of dollars outside the United States and beyond the control of the Federal Reserve**. The 'offshore' currency markets soon became securities markets and, spurred by the U.S. effort to maintain control over capital exports from the United States, markets in Eurodollar securities flourished.

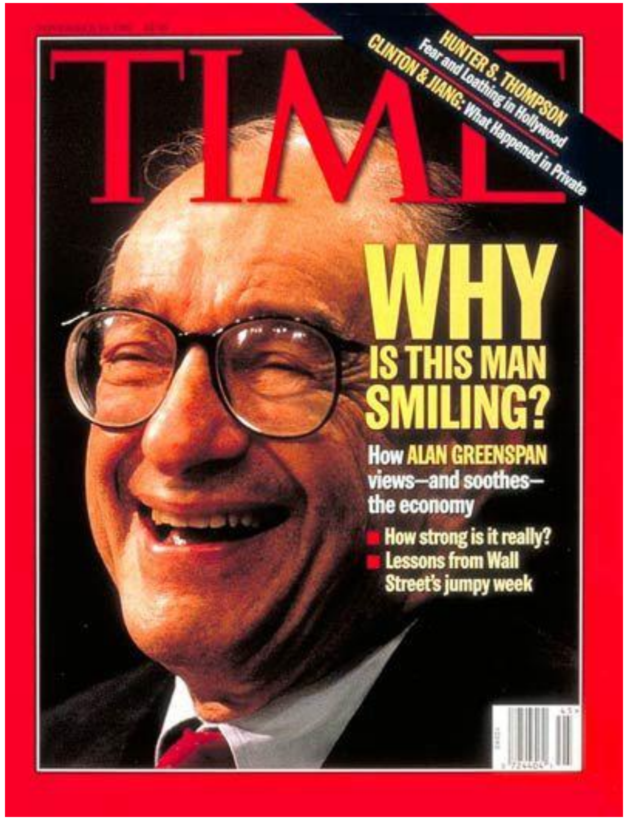
Robert Roosa

The International Monetary System: Forty Years After Bretton Woods

Conference at Bretton Woods sponsored by Federal Reserve Bank of Boston

May 1984

Missing shadow Money

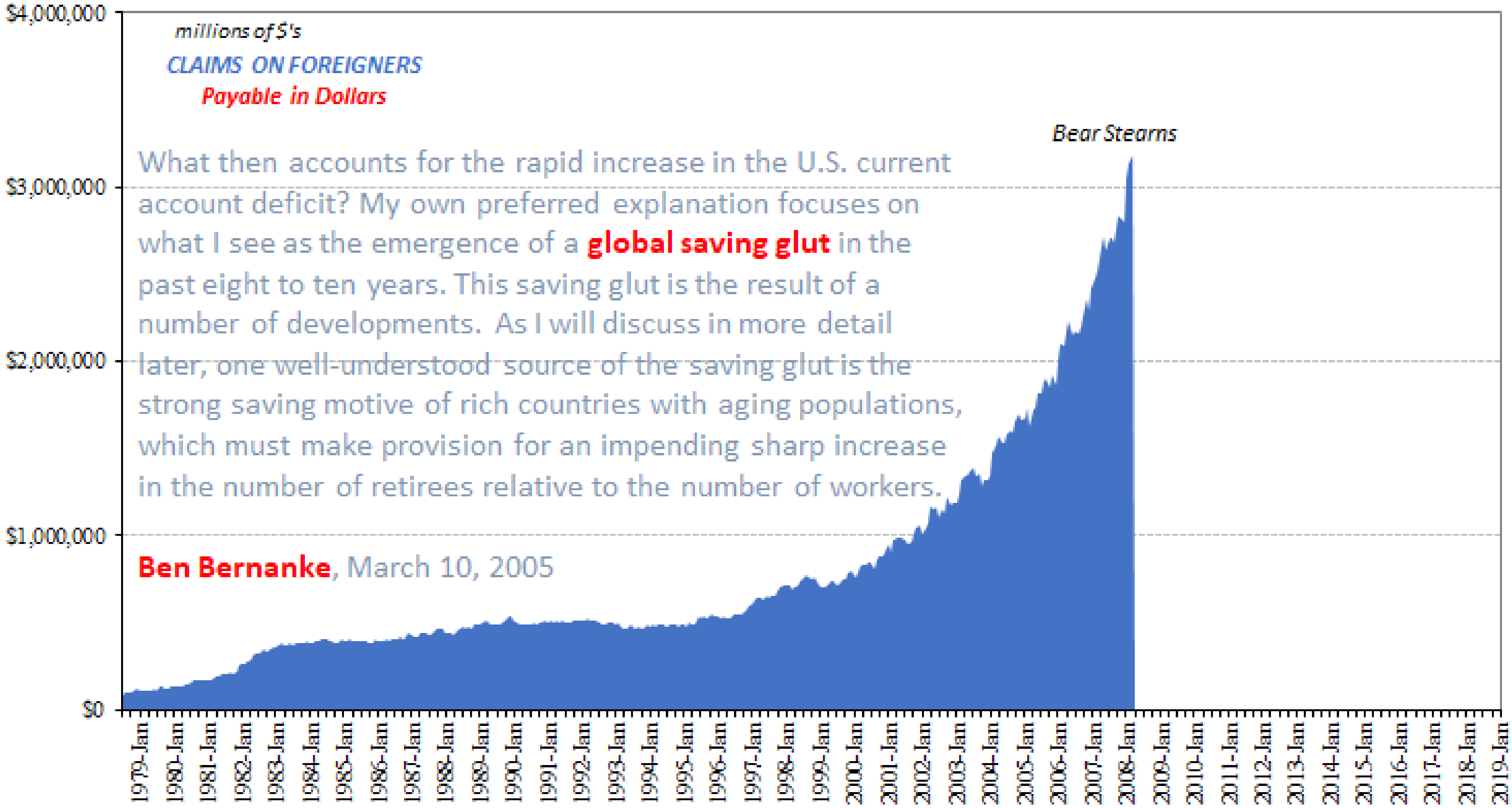


“The problem is that we cannot extract from our statistical database what is true money conceptually, either in the transactions mode or the store-of-value mode. One of the reasons, obviously, is that **the proliferation of products has been so extraordinary that the true underlying mix of money in our money and near money data is continuously changing**. As a consequence, while of necessity it must be the case at the end of the day that inflation has to be a monetary phenomenon, **a decision to base policy on measures of money presupposes that we can locate money. And that has become an increasingly dubious proposition**.

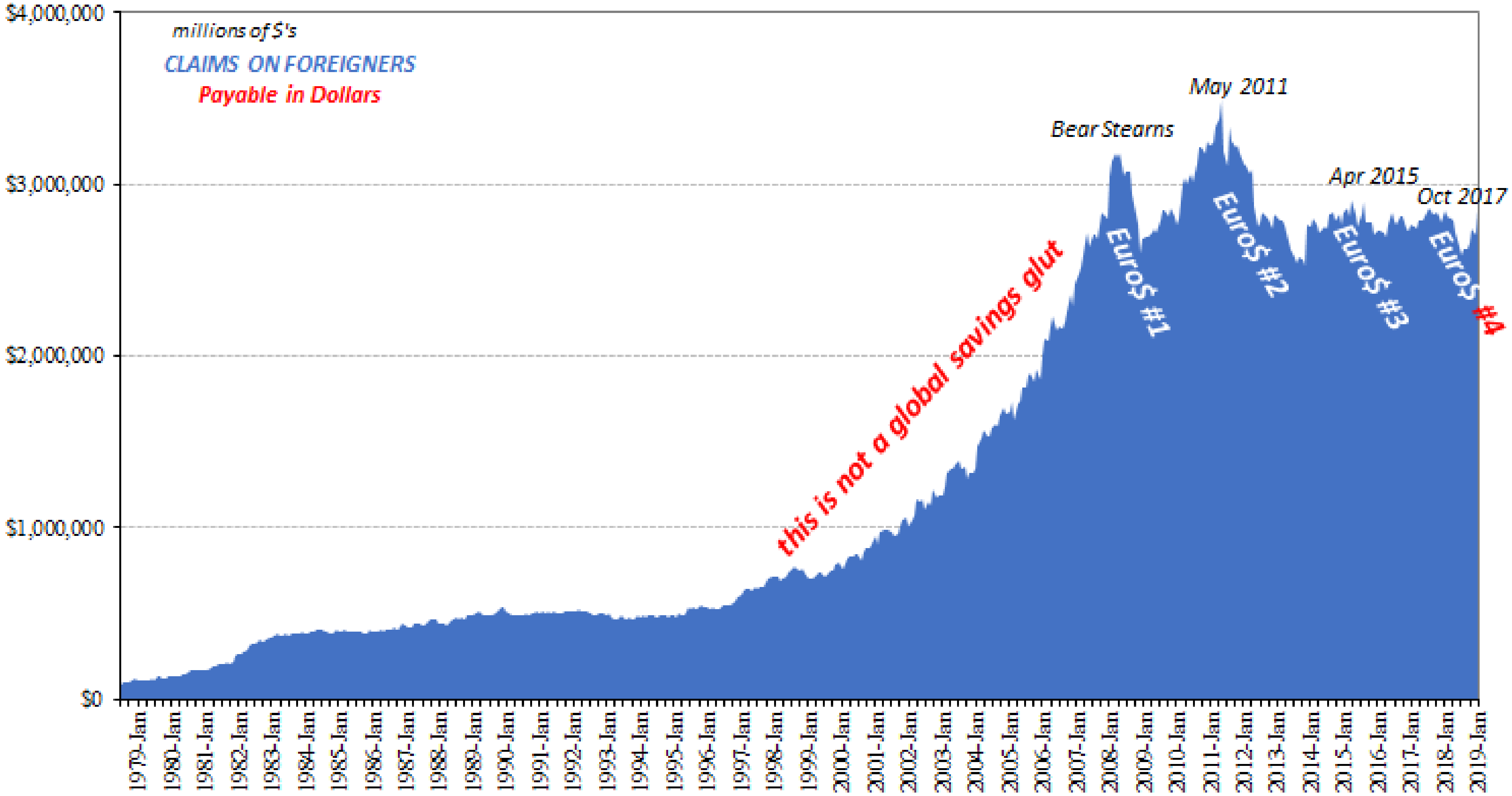
Alan Greenspan
FOMC Meeting Transcript
June 2000

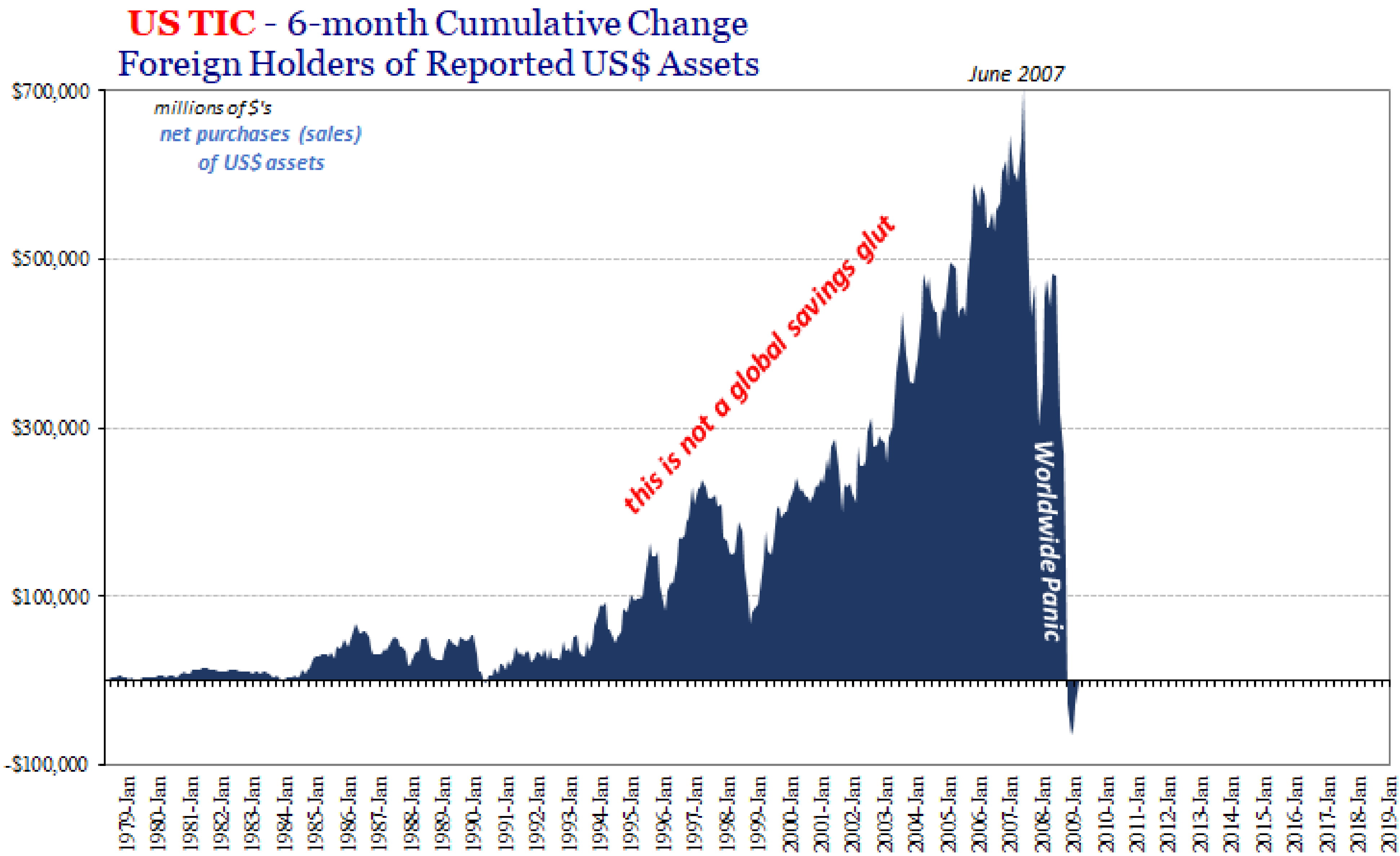
Widely Perceived	Eurodollar System
Central bank is central	Credit-based OFFSHORE system
Money multiplier, deposit-based	Reserve-less, currency-less ledger money
Traditional reserve pyramid	Wholesale, interbank; dynamic bank liabilities
Individual economies are closed systems	Globalized economy intricately linked
Gold Exchange (BW) replaced by US$	Gold Exchange (BW) replaced by Euro$
Bretton Woods ended in 1971	Transition to eurodollar-based system 1950's and 1960's

TIC - US Banking Data



TIC - US Banking Data




US TIC - 6-month Cumulative Change
Foreign Holders of Reported US$ Assets
June 2007
millions of $'s
net purchases (sales)
of US$ assets
this is not a global savings glut
Worldwide Panic
$700,000
$500,000
$300,000
$100,000
-$100,000
1979-Jan
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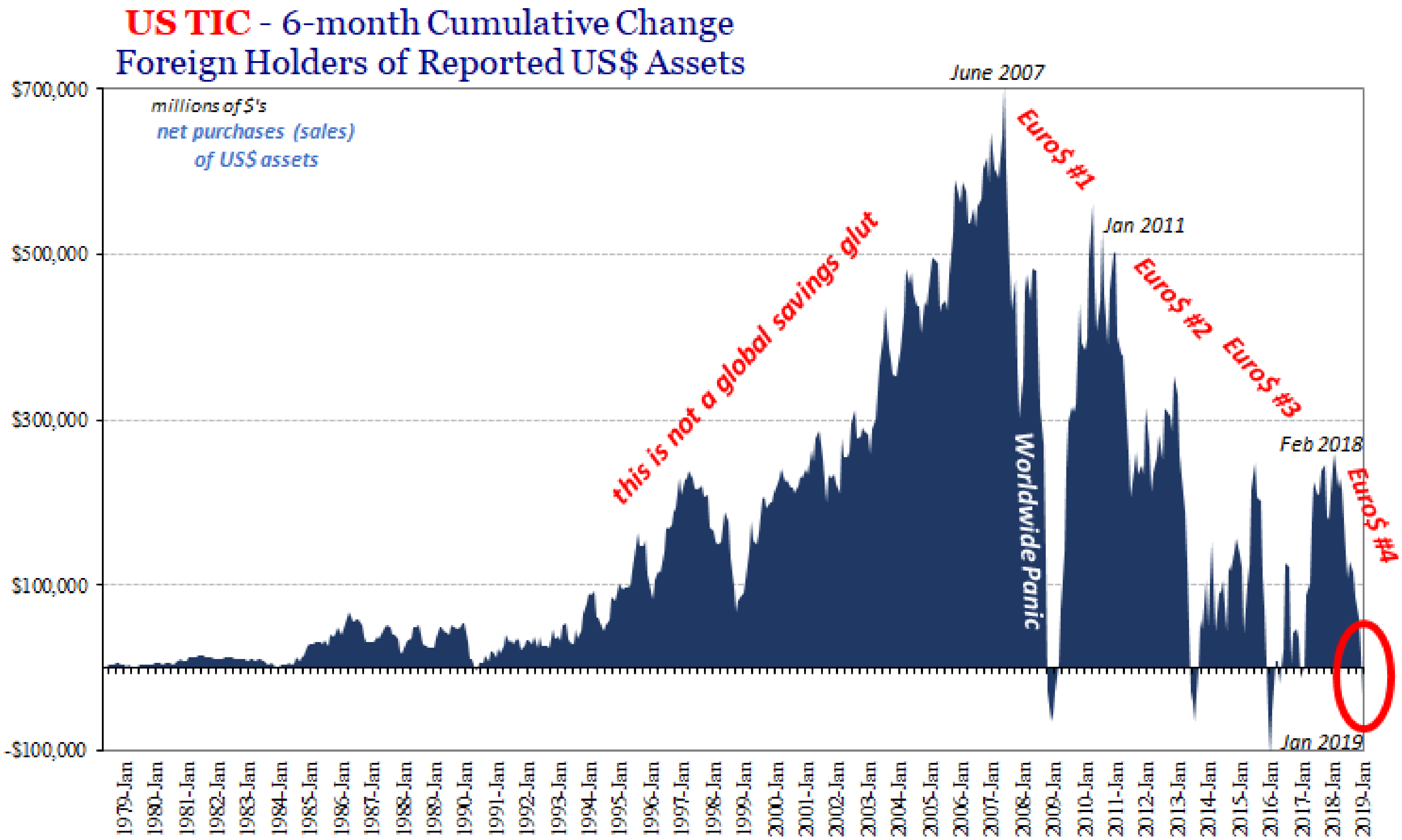
2018-Jan
2019-Jan



US TIC - 6-month Cumulative Change
Foreign Holders of Reported US$ Assets
millions of $'s
net purchases (sales)
of US$ assets
June 2007
Euro$ #1
Jan 2011
Euro$ #2
Euro$ #3
Feb 2018
Euro$ #4
Jan 2019
this is not a global savings glut
Worldwide Panic
$700,000
$500,000
$300,000
$100,000
-$100,000
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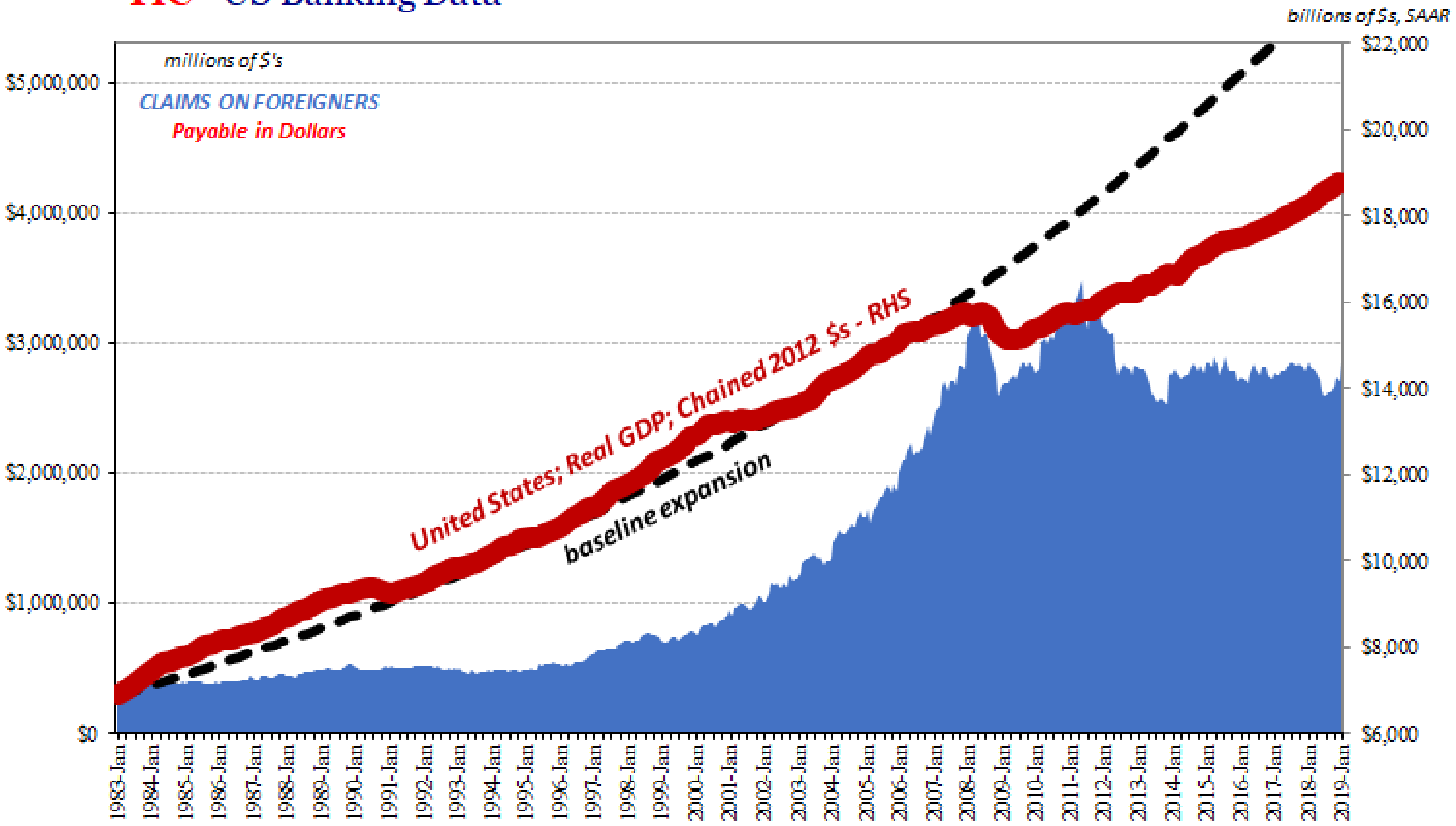
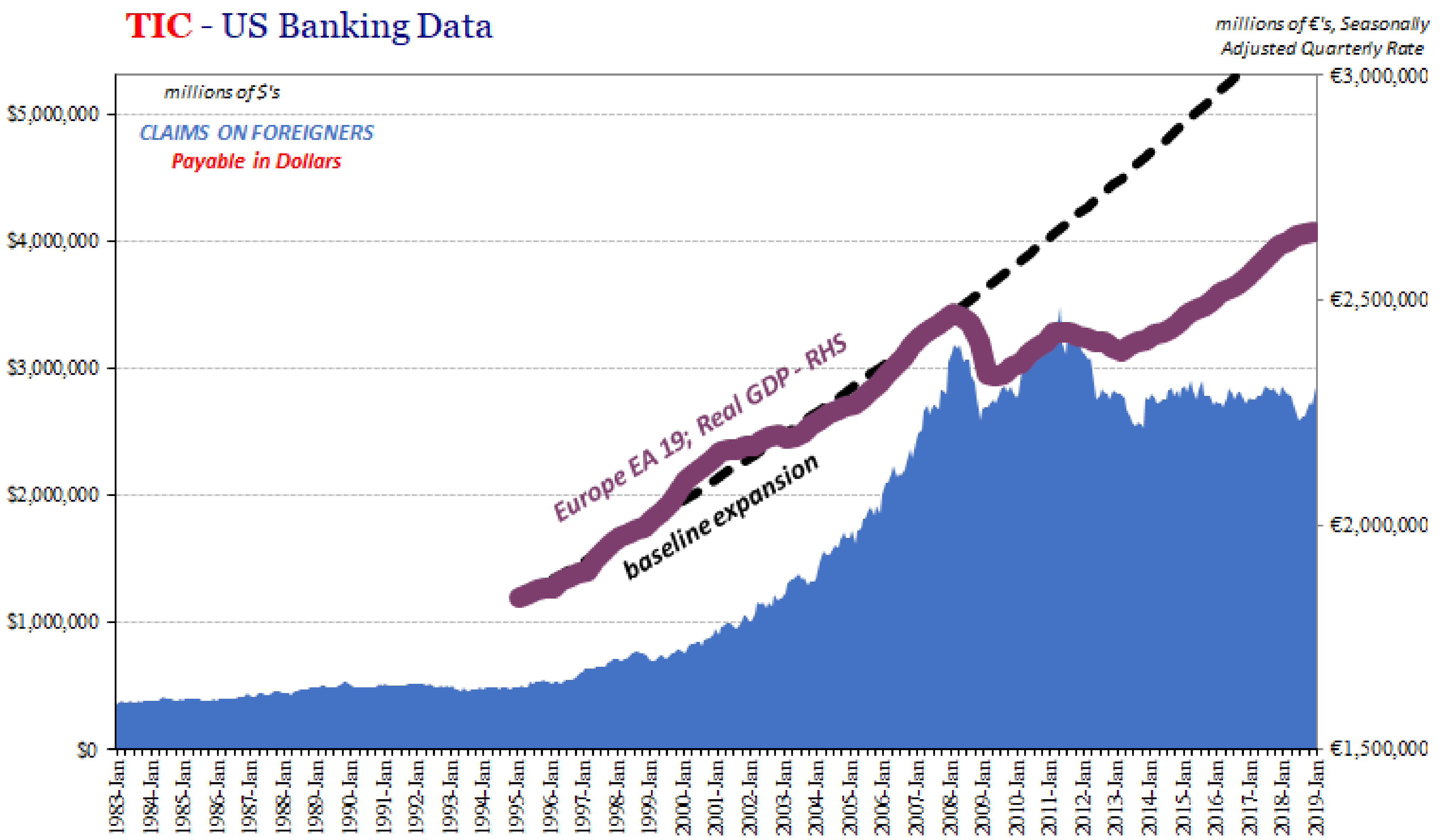
TIC - US Banking Data




TIC - US Banking Data
millions of €'s, Seasonally Adjusted Quarterly Rate
millions of $'s
CLAIMS ON FOREIGNERS
Payable in Dollars
Europe EA 19; Real GDP - RHS
baseline expansion
$5,000,000
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$1,000,000
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€3,000,000
€2,500,000
€2,000,000
€1,500,000
1983-Jan
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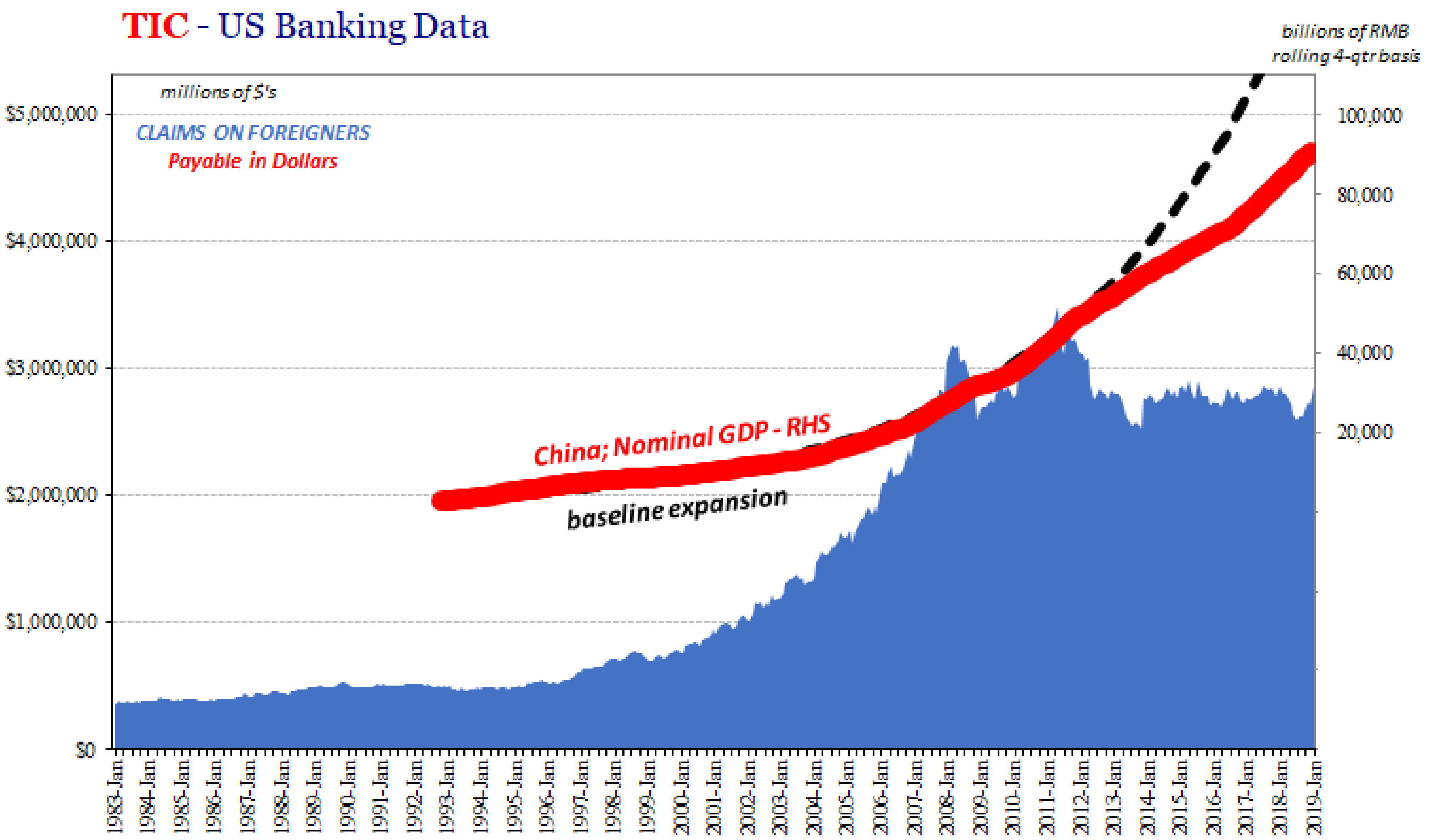
TIC - US Banking Data
billions of RMB
rolling 4-qtr basis
millions of $'s
CLAIMS ON FOREIGNERS
Payable in Dollars
China; Nominal GDP - RHS
baseline expansion
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$0
100,000
80,000
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How might this risk impact the Insurance Industry?

1) Personnel risk
2) Investment Portfolio risk
3) Insurance cycle risk
4) Profitability risk
5) Regulatory risk
6) Rating Agency risk
7) Perception risk

The Big Short, Part II
What to do about the monetary system risk?

- How we might implement these macro economic risks into our risk management structure?

1. Integrate monetary system risks into an Economic Scenario Generator (ESG).

2. Include monetary system risk in your company's risk profile so it does not get overlooked in your risk committee discussions.

This will require critical thinking!