Real-Time Data Research Center: Overview, Bank Products, and Recent Accomplishments

Tom Stark

Real-Time Data Research Center

Research Department

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FEDERAL RESERVE BANK
OF PHILADELPHIA

Overview: Real-Time Data
An Empirical Fact, A Definition, and Importance

- **Fact:** Macroeconomic historical data are subject to constant revision by government statistical agencies
  - **Revisions** give rise to questions about the accuracy of first estimates of historical data
  - **Revisions** give rise to the need to collect and analyze real-time data

- **Definition:** Real-time data are the historical observations before they are subject to revision **or** the forecasts based on such data

- **Importance of Real-Time Data:**
  - Helps to understand economic policy decisions of the past
  - Helps to formulate better policy decisions today
  - Helps to evaluate forecasts and build better models
  - Helps to assess the accuracy of current business conditions

Our Bank Products
Real-Time History, Real-Time Forecasts, and Real-Time Business Conditions

Real-Time History
- Real-Time Data Set for Macroeconomists (RTDSM)

Real-Time Forecasts
- Survey of Professional Forecasters (SPF)
- Livingston Survey
- Federal Reserve Board "Greenbook" Forecasts
- Forecasts for the Chairman's Semiannual Monetary Report to Congress

Real-Time Business Conditions
- Aruoba-Diebold-Scotti Business Conditions Index (ADS)

All products are available on the center's web pages.

www.philadelphiafed.org/ research-and-data/real-time-center/

The Relationship Among Our Products

Our products (shown in red) are associated with the methods that economists use to make policy decisions (shown in yellow).
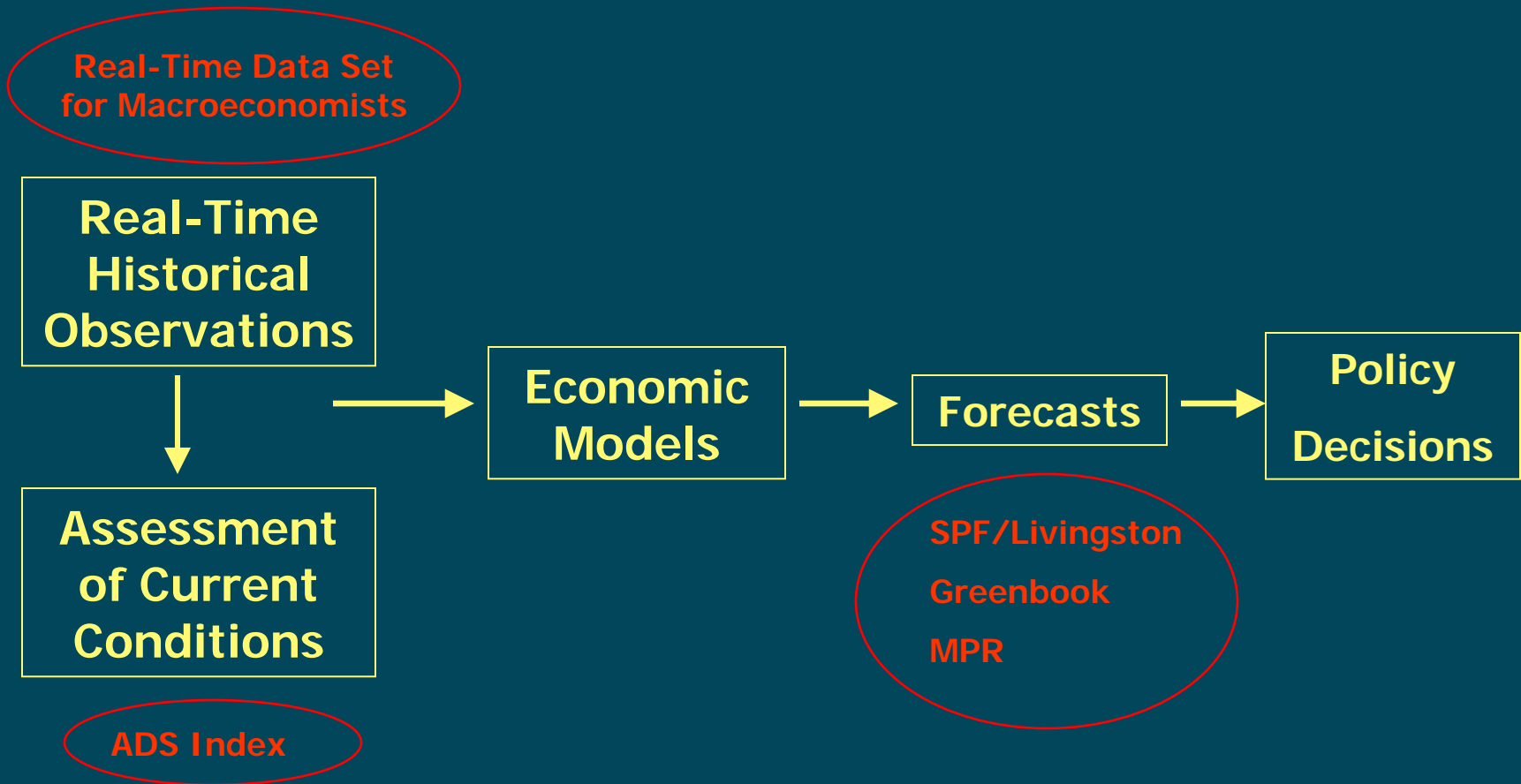
Bank Product:
Real-Time Data Set for Macroeconomists

- Records historical observations on the macroeconomy as they are revised over time by govt statistical agencies
  - 90 macroeconomic variables
  - 13,000 vintages
  - Over 3.2 million data points

- Data set covers
  - Real GDP and components
  - Personal income and components
  - Corporate profits
  - Labor market
  - Inflation measures
  - Financial variables

A Slice of the Real-Time Data Set
The U.S. saving rate in 1975 Q2 was subject to large revision over time.

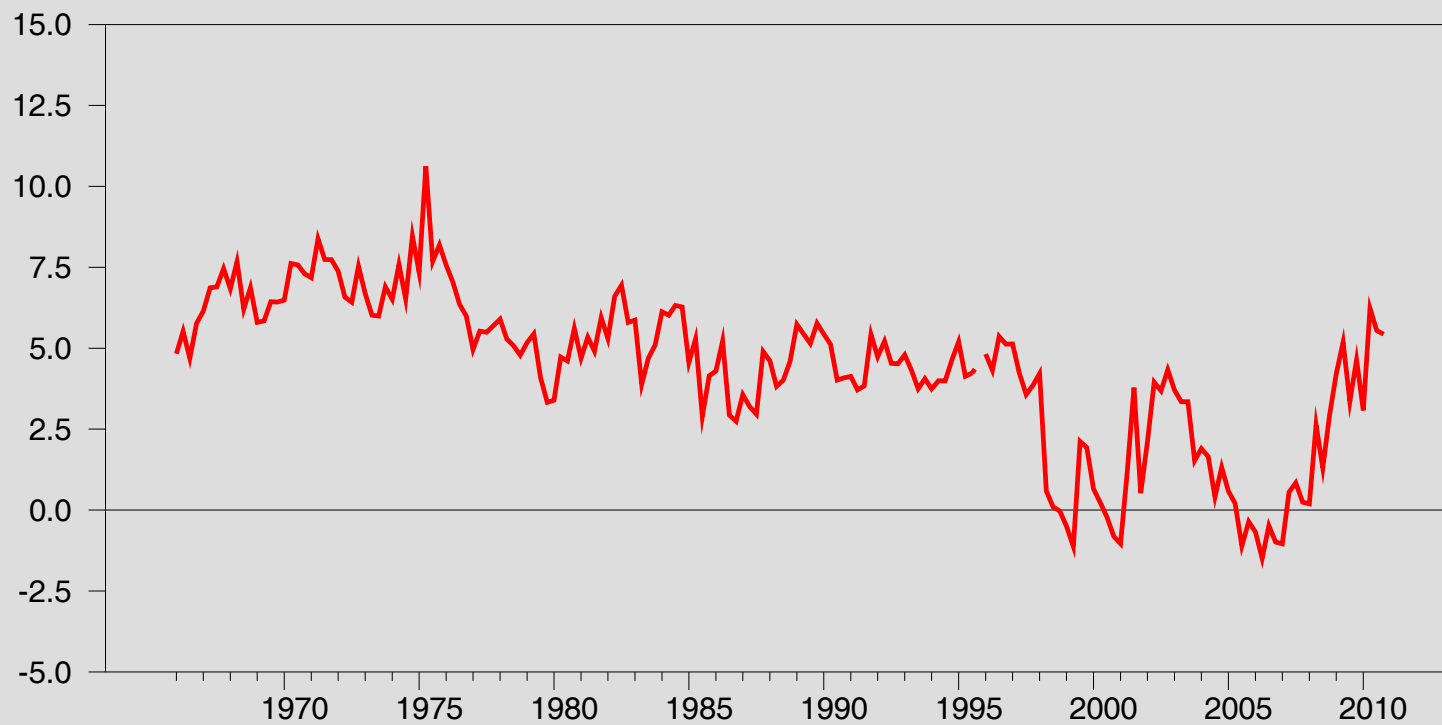|	75 Q3	75 Q4	76 Q1	76 Q2	76 Q3	76 Q4	77 Q1	77 Q2
1973:03	8.0	8.0	8.1	8.1	7.9	7.9	7.9	7.9
1973:04	9.5	9.5	9.2	9.2	8.6	8.6	8.6	8.6
1974:01	8.9	8.9	8.5	8.5	7.7	7.7	7.7	7.7
1974:02	7.4	7.4	6.9	6.9	7.0	7.0	7.0	7.0
1974:03	6.6	6.6	6.5	6.5	6.8	6.8	6.8	6.8
1974:04	8.6	8.6	8.2	8.2	8.0	8.0	8.0	8.0
1975:01	7.5	7.5	7.2	7.2	6.6	6.6	6.6	6.6
1975:02	10.6	10.6	9.9	9.9	9.6	9.6	9.6	9.6
1975:03	#N/A	7.7	7.9	7.9	7.4	7.4	7.4	7.4
1975:04	#N/A	#N/A	8.2	8.0	7.5	7.5	7.5	7.5
1976:01	#N/A	#N/A	#N/A	7.6	6.9	6.9	6.9	6.9
1976:02	#N/A	#N/A	#N/A	#N/A	7.0	7.1	7.1	7.1
1976:03	#N/A	#N/A	#N/A	#N/A	#N/A	6.4	6.4	6.4
1976:04	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	6.0	5.6
1977:01	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	5.0

Example: The U.S. Personal Saving Rate As Initially Reported
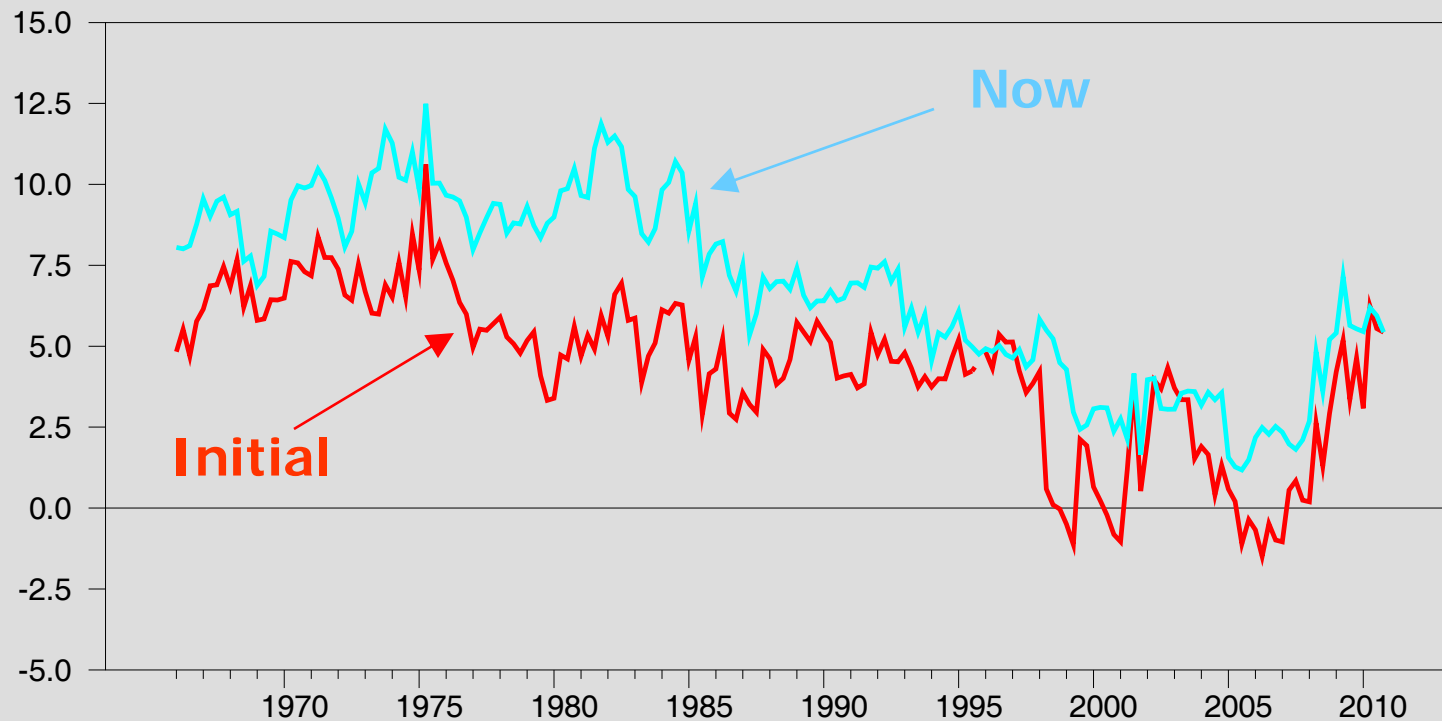

Source: RTDRC real-time data set; Updated from Nakamura and Stark (Phila Fed Working Paper 07-8).

The U.S. Personal Saving Rate
As Initially Reported and Now
The saving rate is almost always revised upward over time.

Source: RTDRC real-time data set; Updated from Nakamura and Stark (Phila Fed Working Paper 07-8).

Bank Product:
Survey of Professional Forecasters

- Surveys 30-40 professional economists on their projections for the U.S. economy
- Longest running <u>quarterly</u> forecast survey
- Survey is large
  - 23 macroeconomic variables
  - Five quarterly horizons; four annual horizons
  - Real GDP and seven components
  - Five measures of inflation
  - Four measures of interest rates
  - Two measures of the labor market
- Survey attracts huge attention
  - News media
  - Economic analysts and researchers
  - Federal Reserve Board staff (and Governors)

Federal Reserve Governor Daniel K. Tarullo Points to Importance of SPF in Congressional Testimony

The Federal Reserve's responsibilities for monetary policy are also relevant for systemic risk monitoring. Systemic risk involves the potential for financial crises to result in substantial adverse effects on economic activity. As the nation's central bank, the Federal Reserve assesses and forecasts the U.S. and global economies using a wide variety of data and analytical tools, some based on specific sectors and others on large-scale models. In the wake of the crisis, research has been expanded to better understand the channels from the financial sector to the real economy. For example, building on lessons from the recent crisis, the Federal Reserve added questions to the Survey of Professional Forecasters to elicit from private-sector forecasters their subjective probabilities of forecasts of key macroeconomic variables, which provides to us, and to the public, better assessments of the likelihood of severe macroeconomic outcomes.

Bank Product:
Livingston Survey

- Surveys academics and professional forecasters

- Longest running survey of the U.S. economy
  - Started by late columnist Joseph Livingston in 1946

- Includes macroeconomic projections for:
  - Real GDP, corporate profits, real investment
  - Inflation, unemployment, stock prices...
  - ...and more

- Most well known for long history of semiannual inflation forecasts
  - Long history provides valuable lessons about monetary policy decisions
  - Huge value for economic researchers

Bank Product:
Greenbook Forecasts

- Produced by Board staff prior to each FOMC meeting
- Posted on RTDRC web pages with permission of Federal Reserve Board
- Data include:
  - Real GDP projections
  - Inflation projections
  - Labor market projections
  - Measures of economic slack
  - Financial assumptions behind projections
- Helps researchers to understand:
  - Monetary policy decisions of the past
  - Accuracy of professional forecasts

Bank Product:
Forecasts for Monetary Policy Report (MPR) to Congress

- Shows projections submitted by Governors and Fed Presidents prior to Chairman's Semiannual Monetary Policy Report to Congress
  - Real GDP
  - Inflation
  - Unemployment
- May contain more information about policy decisions than Greenbook forecasts
  - Greenbook forecasts reflect the Board staff's viewpoint
  - MPR forecasts reflect the viewpoints of FOMC members

Bank Product:
Aruoba-Diebold-Scotti
Index of Business Conditions (ADS Index)

- Optimally extracts the common information contained in six closely watched component variables

- Unique features make the index the most popular RTDRC product:
  - Updated frequently (in response to the flow of incoming information on the macroeconomy)
  - Applies advanced statistical techniques
  - Tracks business conditions on a daily basis

- Empirical evidence indicates early readings provide accurate assessment of business conditions

Support for Our Products

We provide support for our products through frequent interaction with the public in a variety of ways.

- Extensive online documentation
  - The center's analysts devote substantial time to maintaining our documentation
- Quick e-mail responses to questions
- Frequent telephone conversations
- Interviews with news media
  - Atlanta Journal-Constitution
  - New York Times
  - Wall Street Journal
  - Philadelphia Inquirer
- Occasional one-off analyses. (Example follows.)

Example:
One-Off Analysis of Unemployment

In September 2009, what was the risk that the U.S. unemployment rate could reach 15 percent?

Background

- In September 2009, a well-known economics commentator asserted:

  4% Probability That Unemployment Reaches 15% or More
(Over Next Three Years)

- Unemployment in August 2009 was 9.7%, up from 4.9% in December 2007 (the month of the business cycle peak), measured, of course, in real time

- A Reader of the SPF Asks: How Realistic is the Commentator's View?

Example:
# One-Off Analysis of Unemployment

How realistic is the commentator's view?

- 2009Q3 SPF shows:
  - Unemployment on a downward trajectory over next three years
  - Panelists estimate probability of 15% unemployment at much less than 4%

- But how realistic is the SPF?
  - A small-scale vector error corrections model suggests little chance of 15% unemployment
  - 5000 bootstrap-t simulations provide confidence intervals (50%,80%,90%,95%) around the point forecast

Unemployment Analysis: September 2009
History, Forecast, and Ranges of Uncertainty
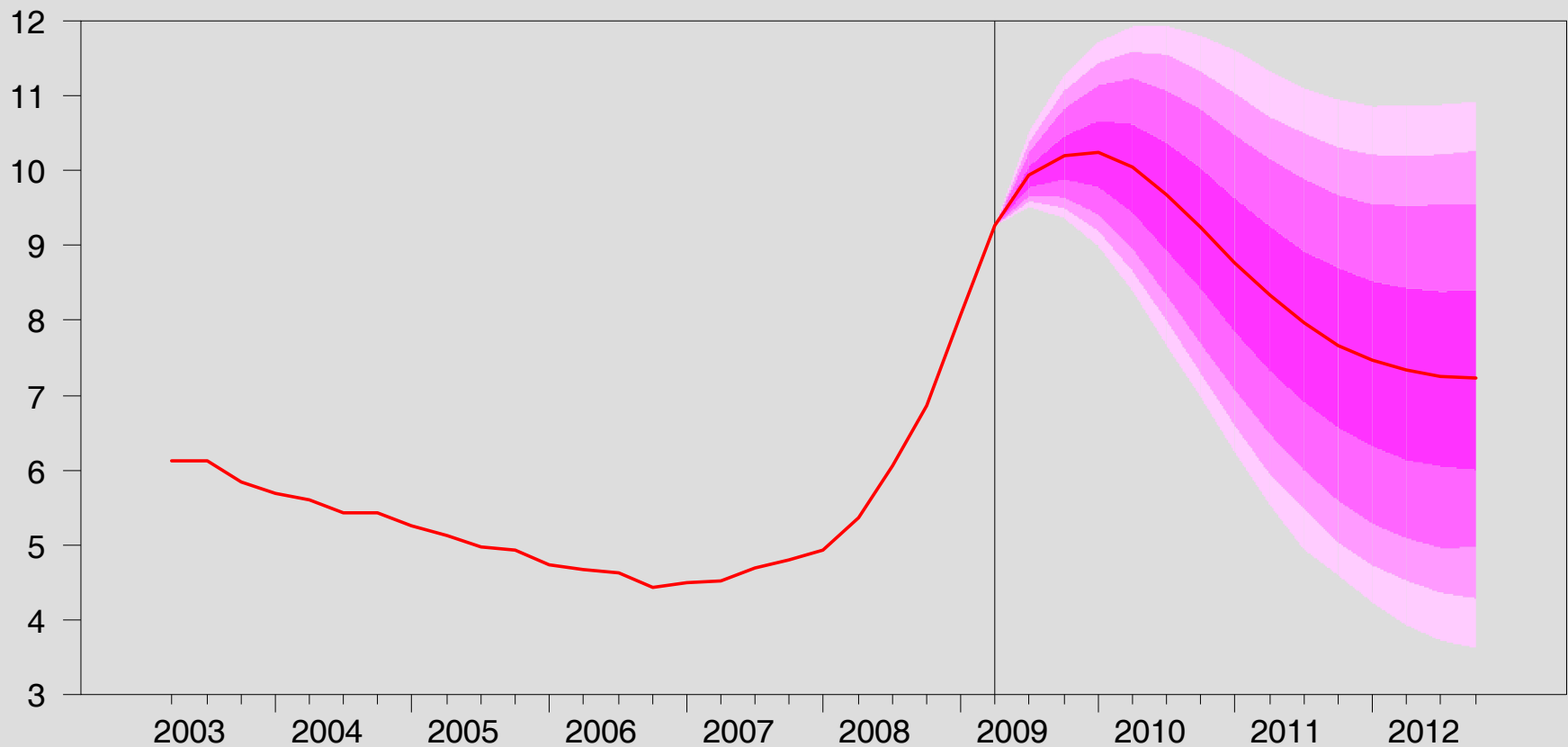
Summary of RTDRC
Bank Products

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Recent Accomplishments and Plans for the Future

- New SPF-Based Measures of Economic Uncertainty Released to the Public (John Chew)

- Analysis of Real-Time Accuracy of the ADS Index Released to the Public (Calvin Price)

- Plans for Future Work (Keith Sill)

Tom Stark
Real-Time Data Research Center
Research Department
Federal Reserve Bank of Philadelphia

Tom.Stark@phil.frb.org