More pluralism, more stability?

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I would like to thank the organisers for the kind invitation to speak at this prestigious conference. I am delighted and honoured to be in such distinguished company.

The question I would like to address today is whether a more pluralistic international monetary system – one with more international currencies on a more equal footing – would enhance global monetary, financial and macroeconomic stability.

This is a perennial question. It was, for instance, just as prominent under the Bretton Woods system as under the arrangements that have followed – which some regard as a "non-system" (eg Padoa-Schioppa and Saccomanni (1994)). And it presupposes the answer to another, more fundamental, question: what is the Achilles heel of the international monetary and financial system (IMFS)?

Note that I am choosing my words carefully. For, the "financial" dimension is just as important as the "monetary" one, although the shorthand "international monetary system" is much more common. This tendency perhaps harks back to post-war arrangements in which, for quite some time, finance played a subordinated role owing to constraints on capital flows and foreign exchange transactions. As we all know, that world is long gone.

There are three takeaways from my presentation.

First, there is no doubt that the dominance of one currency creates challenges for the IMFS. Fundamentally, the domestic interests of the country of issue need not coincide with those of the system as a whole.

Second, it is less clear, though, whether a more pluralist system, even if it was achieved, could help address the IMFS's main weakness. To my mind, that weakness is its inability to prevent the build-up and unwinding of hugely damaging financial imbalances, or outsize financial cycles, thereby amplifying weaknesses in national arrangements (Borio (2014a)). This is what, with a colleague, Piti Disyatat, we have termed its "excess (financial) elasticity" (Borio and Disyatat (2011)). Think of an elastic band that you can stretch out further and further but that, as a result, snaps back more violently.

Third, addressing this weakness would require stronger anchors at national and international level. Some progress has been made, especially at national level. But much more needs to be done.

In what follows, I will first recall some basic facts to illustrate the US dollar's dominance in the IMFS. Here I will consider the dollar's three familiar roles, as a means of payment, a store of value and a unit of account. I will then explore the possible problems that this can create and put forward three propositions. I will finally turn to possible solutions and make three observations.

The views expressed in this presentation are my own and do not necessarily reflect those of the BIS.
Outline

- A new approach to estimate shadow rates
- Two shades of shadow rates
- Multidimensionality of monetary policies
Assumptions

Consistent linear relationship with growth and inflation throughout the sample

- $y_t$: log of real GDP; $p_t$: log of the GDP deflator; $s_t$: shadow rate

\[
\begin{align*}
x_t &= [y_t \ p_t \ s_t]' \\
x_t &= c + A_1 x_{t-1} + ... + A_4 x_{t-4} + \varepsilon_t, \varepsilon_t \sim i.i.d \ N(0, \Omega) \\
\xi_t &= [x'_t \ ... \ x'_{t-3}]' \\
\xi_{t+1} &= d + F \xi_t + \nu_{t+1}
\end{align*}
\]

Identical to short rate before the ZLB

- $s_t = i_t^0$ if before the ZLB, where $i_t$ is the 3M T-bill rate
Relating to observables

- **VAR-implied forecasts**

  \[ \xi_{t+h|t} = (I + ... + F^{h-1})d + F^h \xi_t \]

- **Survey-implied forecasts**

  \[ \tilde{o}_t = \begin{bmatrix} \Delta y_{t+1|t}^o & \cdots & \Delta y_{t+7|t}^o & \Delta p_{t+1|t}^o & \cdots & \Delta p_{t+7|t}^o \end{bmatrix} \]

  \[ \tilde{o}_t = \tilde{a} + \tilde{H}' \xi_t + \tilde{w}_t, \tilde{w}_t \sim N(0, \tilde{R}) \]
State space model

Transition equation: \[ \xi_{t+1} = d + F \xi_t + \nu_{t+1} \]
Observation equation: \[ \tilde{\sigma}_t = \tilde{a} + \tilde{H}' \xi_t + \tilde{w}_t \]
\[ i^o_t = s_t \text{ if } t \leq 2008Q3 \]

Estimating transition equation using data up to 2008Q3

Applying Kalman filter to obtain \( \hat{s}_t|t \)
Comments

New aspects

- making use of survey data
- $s_t$ beyond $i_t^o$ post-ZLB
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Full model estimation
- Especially important for models without restricting $i_t^o = s_t$ if $t \leq 2008Q3$.
- Convergence challenge: good/a large number of initial values
New aspects
  ▶ making use of survey data
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Information in survey data
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Full model estimation
  ▶ Especially important for models without restricting
    $i_t^o = s_t$ if $t \leq 2008\text{Q}3$.
  ▶ Convergence challenge: good/a large number of initial values

Robustness
  ▶ logarithm vs first difference of logarithm
  ▶ BCEI forecasts vs CE forecasts/SPF
Two shades of shadow rates
shadow rate term structure model

▶ Assumption

\[ r_t = \max(s_t, 0) \]
\[ s_t = \mu + \rho s_{t-1} + \varepsilon_t \]

▶ Relating to observables

\[ y^n_t = -\frac{1}{n} \log(\mathbb{E}^Q[e^{-r_t-r_{t+1}-\ldots-r_{t+n}}]) \]
\[ = -\frac{1}{n} \log(\mathbb{E}^Q[e^{-\max(s_t,0)-\max(s_{t+1},0)-\ldots-\max(s_{t+n},0)}]) \]
\[ = g(s_t; \theta) \]

▶ Full model estimation

Transition equation: \[ s_t = \mu + \rho s_{t-1} + \varepsilon_t \]
Observation equation: \[ Y^o_t = G(s_t; \theta) + w_t \]
Applications

- Yield curve fitting

- Fed funds rate equivalent at ZLB

- Capturing unconventional monetary policy tools

- Preserving relation between Fed funds rate and macro variables
Two shades of shadow rates
Multidimensionality of monetary policies

- Real problem: short rate may not be adequate to capture monetary policies.
Multidimensionality of monetary policies

- Real problem: short rate may not be adequate to capture monetary policies.
The bar chart illustrates the following variables over two distinct periods:

- **3M T-bill (%)**
- **Fed balance sheet (tn USD)**
- **10y Treasury yields (%)**
- **Term premia (%)**
- **Expectation component (%)**

The periods compared are:

- **2004 May - 2004 Oct**
- **2017 Jul - 2018 Apr**

The chart indicates significant differences in these variables between the two periods, with a notable increase in Fed balance sheet and Term premia, and a decrease in 3M T-bill and 10y Treasury yields.
A new approach to estimate shadow rates

The importance of modeling monetary policies with a multidimensional object

Different facets of monetary policy shocks: target, path and term premia, Gurkaynak et. al. (2005), Swanson (2017), Inoue and Rossi (2018).
Figure: Average US Treasuries forward curve in 2012
Figure: Impact of taper tantrum
Replace the fed funds rate with $s_t$ in FAVAR

$$x_t^m = \mu^x + \rho^{xx} X_{t-1}^m + u_t^x$$

$$+ \mathbb{1}(t<\text{December 2007}) \rho_1^{xs} S_{t-1}$$

$$+ \mathbb{1}(\text{December 2007} \leq t \leq \text{June 2009}) \rho_2^{xs} S_{t-1}$$

$$+ \mathbb{1}(t>\text{June 2009}) \rho_3^{xs} S_{t-1}$$

Null hypothesis

$$H_0 : \rho_1^{xs} = \rho_3^{xs}$$

Likelihood ratio test $\chi^2(39)$:

$$p = 0.29$$