Comments on : "Volatility spillovers of Federal Reserve and ECB balance sheet expansions to EMEs" by A. Apostolou and J. Beirne

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- Econometric framework: Conditional Volatility using GARCH-type models

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- Look at the effects of balance sheet volatility on macro and financial volatility in EMEs
- A split by various types of volat: bonds, currencies, stock prices and macro
- Econometric framework: Conditional Volatility using GARCH-type models
- Results:
  1. Bond markets the most sensitive
  2. FED spillovers much stronger than ECB spillovers on currencies
  3. Negative spillovers on stock markets
  4. Limited evidence of spillovers on macro variables

C1: Econometric specification issues

Very tempting to play with the data

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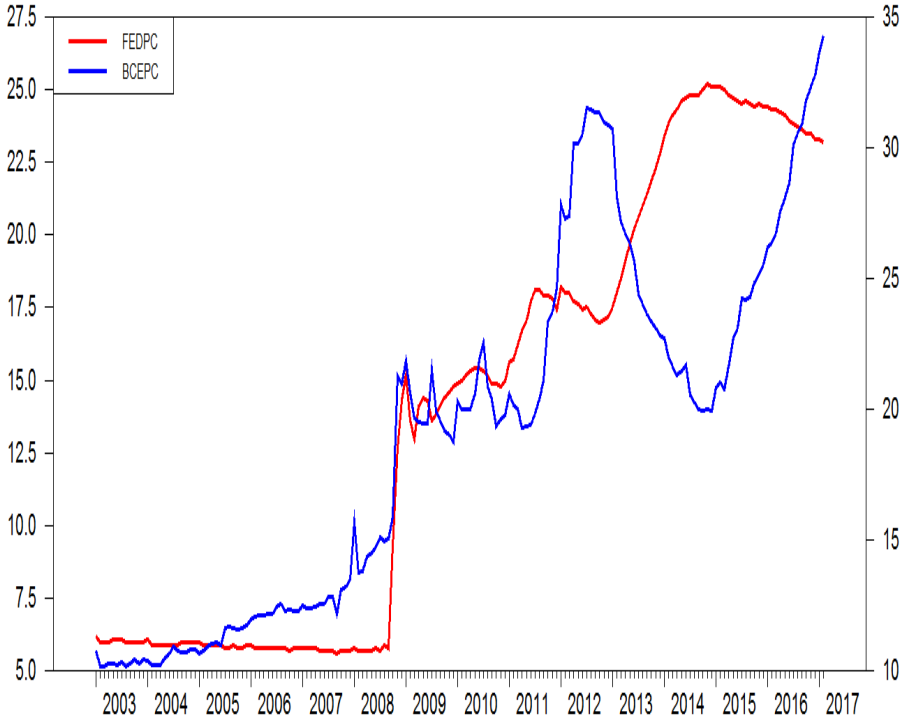
Figure : *Balance sheets in % of GDP*



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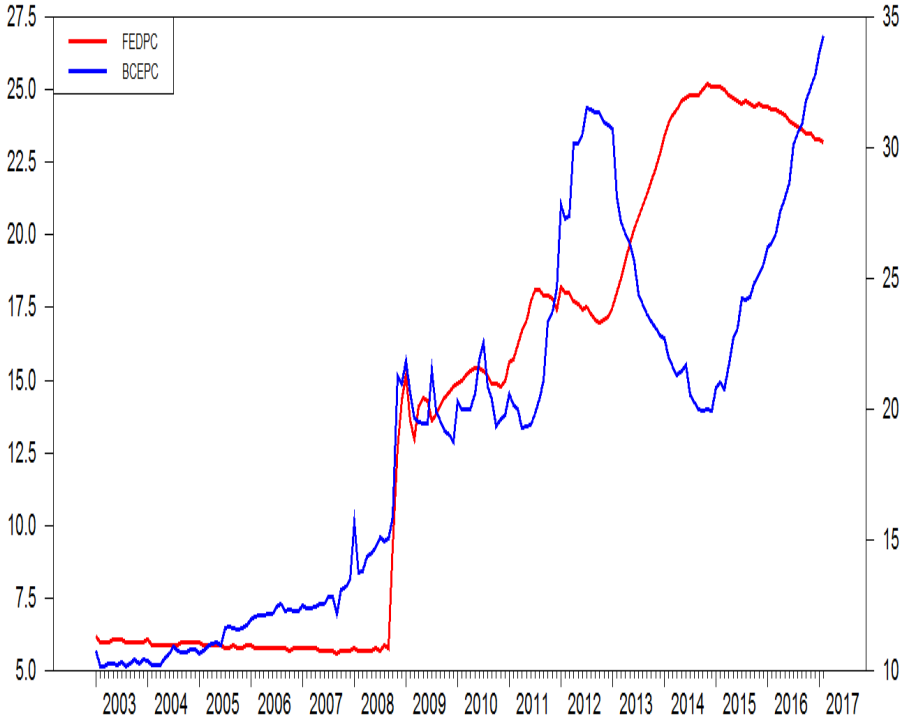
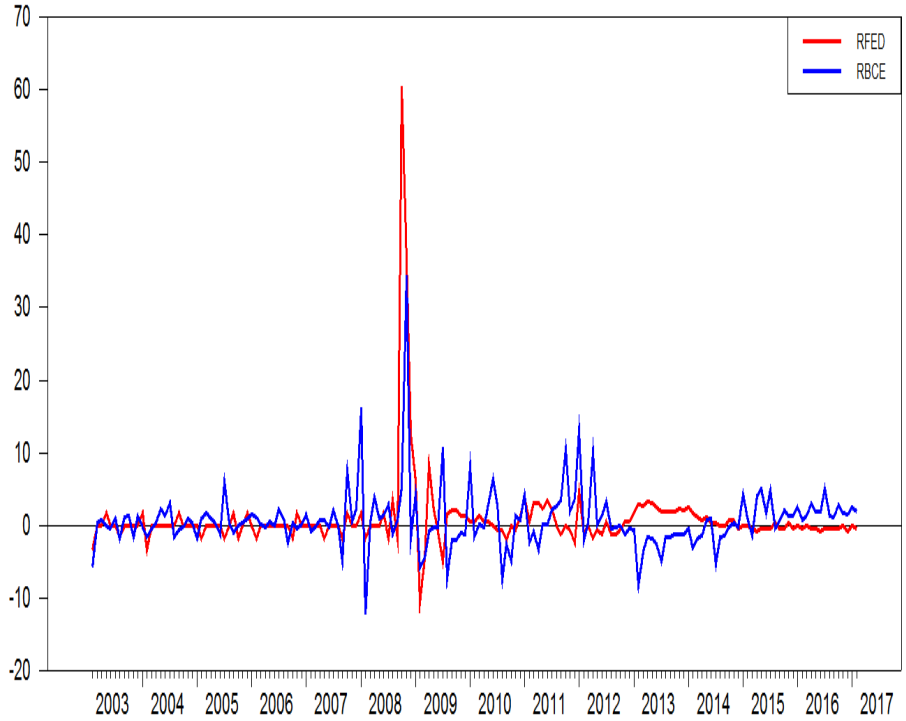


Figure : *Growth rate over 1-month*



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Unfortunately, unable to estimate a GARCH(1,1) with a standard package (convergence issue, explosive parameters, non-significant parameters)

The GARCH(1,1) model used in the paper is the sum of 2 components (with some constraints on parameters to ensure stationarity):

$$r_t = \mu_t + \sigma_t z_t$$

Conditional Mean equation:

$$\mu_t = \alpha$$

Conditional Variance equation:

$$\sigma_t^2 = \omega + \beta r_{t-1}^2 + \gamma \sigma_{t-1}^2$$

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First: Is there really no dynamics in the mean equation ?

AR(1) estimation:

$$r_{cb,t} = \alpha_{cb} + \rho_{\mathbf{cb}} \mathbf{r_{cb,t-1}} + \varepsilon_t$$

Results over 2003m1 - 2014m12:

FED: $\hat{\rho}_{cb} = 0.45$ (t-stat$= 6.05$)
ECB: $\hat{\rho}_{cb} = 0.01$ (t-stat$= 0.15$)

Not integrating dynamics in the mean equation for the FED may be misleading

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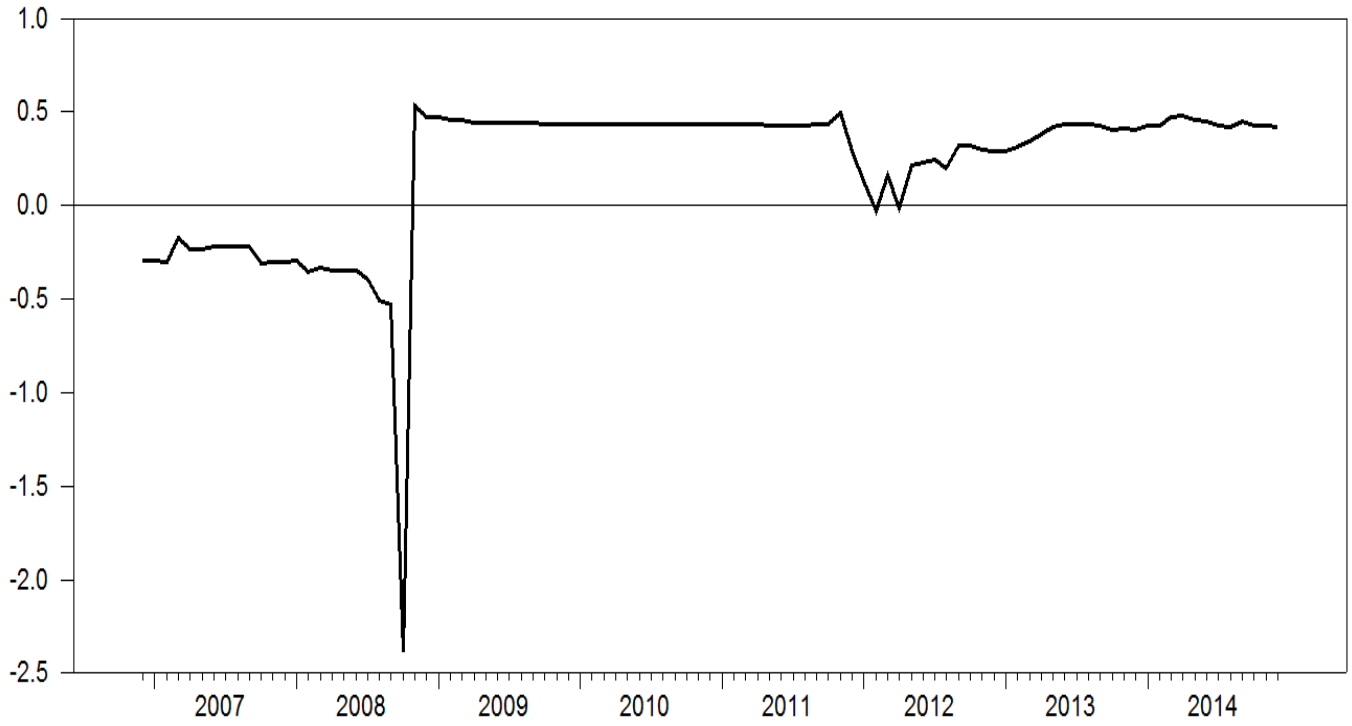
Rolling AR(1): Evidence of a change in regime for $\hat{\rho}_{cb}$, using a 3-year rolling window for the FED



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At the end of the day, the only significant model I get: An asymmetric AR(1)-ARCH(1) model of the form :

$$r_{cb,t} = \alpha_{cb} + \rho_{cb} r_{cb,t-1} + \sigma_{cb,t} z_{cb,t}$$

with

$$\sigma^2_{cb,t} = \omega_{cb} + \gamma_{cb} \sigma^2_{cb,t-1} + \delta r^2_{cb,t-1} 1(r_{cb,t-1} > 0)$$

Not sure the AR(1)- GJR-ARCH(1) is the correct model, but very different for GARCH(1,1)

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Analysis is based on coefficient ϕ in Table 1 and Table 2. What is ϕ? Equation (4) of the 2-step approach:

$$r_{em,t} = \alpha_{em} + \phi \varepsilon_{cb,t} + \sigma_{em,t} z_{em,t}$$

with

$$\varepsilon_{cb,t} = r_{cb,t} - \hat{\alpha}_{cb} - \hat{\sigma}_{cb,t} z_{cb,t}$$

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Thus, conditional mean and variance for $r_{em,t}$ are:

$$E[r_{em,t}|F_{t-1}] = \alpha_{em} + \phi \varepsilon_{cb,t}$$

$$V[r_{em,t}|F_{t-1}] = \sigma^2_{em,t} = \omega_{em} + \gamma_{em} \sigma^2_{em,t-1} + \beta_{em} r^2_{em,t-1}$$

ϕ gives information on the conditional mean, not the conditional variance of EMEs

C1: Econometric specification issues

Various alternatives in the literature: multivariate GARCH, spillovers a la Diebold-Yilmaz, ...

Simple option: Introduce the CB conditional variance in the variance equation

$$\sigma^2_{em,t} = \omega_{em} + \gamma_{em}\sigma^2_{em,t-1} + \gamma_{\mathbf{cb}}\sigma^{\mathbf{2}}_{\mathbf{cb,t-1}} + \beta_{em} r^2_{em,t-1}$$

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Estimation of the Fed impact on Brazilian stock prices (ARCH(1) model):

$$\hat{\phi} = -0.0039, (t = -0.45)$$

but

$$\hat{\gamma}_{em} = 0.49, (t = 2.46)$$

$$\hat{\gamma}_{cb} = -0.53, (t = -3.23)$$

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Standard channels of international transmission of monetary policy shocks are well considered in the paper, assuming FED/ECB generate exogeneous volatility shocks:

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- Exchange rates
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C2.1/ There is no control of other sources of volatility shocks, e.g.:

- Exchange rate shock in China (Summer 2015, January 2016)
- Commodity price drop mi-2014
- Other sources of economic policy uncertainty / volatility in ADV (Brexit, elections, protectionism measures, global risk aversion ...)

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Ironically, EMEs with positive CA and high international reserves were more adversely exposed to the Taper tantrum in May 2013, possibly because they were precisely those countries attracting the largest share of financial flows during the QE (Aizenman, Binici, Hutchinson, NBER, 14).

Do we have a similar pattern with volatility ?

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C2.3/ Are the channels of transmission homogeneous across EMEs ?
For example, financial openness is likely to play a role in the transmission of volatility shocks: How to account for this ?
An idea: explain correlations by a set of fundamentals (CA, Openness, Reserves ....)

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C2.5/ Are the channels of transmission of conventional monetary policy volat similar to those UMP volat?
A comparison would useful

C3: Other remarks

- Symmetry: Is an increase in the BS equivalent to a decrease ?
- Non-linearity: Is there any sensitivity to the level of interest rates ?
- Joint effects : What are the joint spillover effects of Fed and ECB on EMEs when :
  - Both CB increase their BS (2008-2012)?
  - UMP are asynchronous (2013-2014)?
  - Fed is flat but ECB increases (2015-2017)?

  Buitron and Vesperoni (IMF WP, 2015) look at joint effects on EMEs, as well as cross effects