Macro-Financial Interactions in a Changing World

Presented by Eddie Gerba

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Introduction

For each economy, we construct::

Time-varying cycles

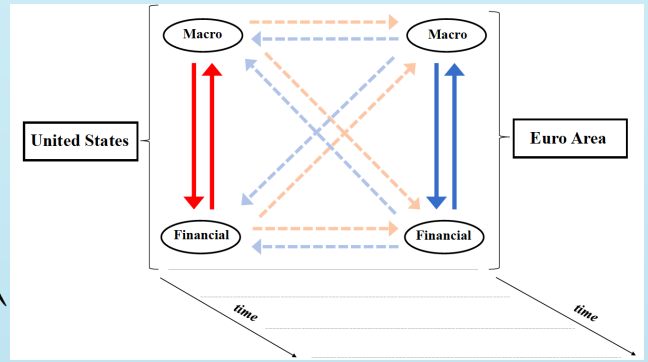
- Time-varying contemporaneous relation between factor loadings and each cycle
- Time-varying contemporaneous correlation between cycles
- Time-varying impulse response functions
- Time-varying forecast error variance decomposition

For the international (global) model

- Time-varying cross-country impulse response functions

Robustness checks:

- Re-calculate all using *principal component analysis, orthogonal factor innovations, Cholesky factorizations semi-recursive, and a break in US volatility in 1985.*



Empirical set-up

- **US** - 32 variables selected 1960:Q1-2017:Q4;
- **Euro Area** - 29 variables selected 1980:Q1-2014:Q4.
- Estimation of **two dynamic factors per country** where weights of each variable in factor is time-varying.
- In parallel, a structural relationship is imposed in the interaction between the two cycles in each period using sign, exclusion, and timing restrictions.
- In the international model, **the two economies are jointly modeled (including the factors and shocks).**
- All autoregressive coefficients and coefficients measuring sensitivity of cycles to shocks can evolve over time.
- Unfortunately, **all time variation has been squeezed into the coefficients**. Hence the motivation for re-estimating the full model using break in volatility in 1985.

US data sample

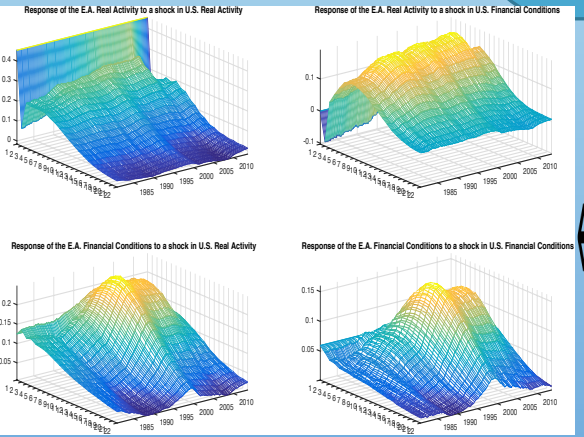
ID	Trans.	Description
F1	2	Nonfinancial Corporate Business; Net Worth, Billions of Dollars
F2	2	Nonfinancial Corporate Business: Profits After Tax (without IVA and CCAdj), Billions of Dollars
F3	2	Private Residential Fixed Investment, Billions of Dollars
F4	2	Households and Nonprofit Organizations; Net Worth, Billions of Dollars
F5	2	Nonfinancial Corporate Business; Credit Market Instruments; Liability, Billions of Dollars
F6	2	Households and Nonprofit Organizations; Credit Market Instruments; Liability, Billions of Dollars
F7	2	Households and Nonprofit Organizations; Home Mortgages; Liability, Billions of Dollars
F8	2	All Sectors; Commercial Mortgages; Asset, Billions of Dollars
F9	2	Households and Nonprofit Organizations; Total Time and Savings Deposits; Asset, Level, Billions of Dollars
F10	2	Households and nonprofit organizations; corporate equities; asset, Level, Billions of Dollars
F11	2	Federal Government; Credit Market Instruments; Liability, Level, Billions of Dollars
F12	2	S&P500
F13	2	M1 Money Stock, Billions of Dollars
F14	2	Velocity of M1 Money Stock, Ratio
F15	2	Velocity of M2 Money Stock, Ratio
F16	2	M2-M1 Money Stock, Billions of Dollars
F17	2	Velocity of MZM Money Stock, Ratio
F18	1	AAA-spread
F19	1	BAA-spread
F20	1	Corporate risk spread
F21	1	10-Year Treasury Constant Maturity Rate, Percent
F22	2	Total Consumer Credit Owned and Securitized, Outstanding, Billions of Dollars
F23	2	Households and Nonprofit Organizations; Consumer Credit; Liability, Billions of Dollars
R1	2	Real Gross Domestic Product, Billions of Chained 2009 Dollars
R2	2	Real Personal Consumption Expenditures, Billions of Chained 2009 Dollars
R3	2	Nonfarm Business Sector: Real Compensation Per Hour, Index 2009=100
R4	2	Real Gross Private Domestic Investment, Billions of Chained 2009 Dollars
R5	2	Real Disposable Personal Income, Billions of Chained 2009 Dollars
R6	2	Average Weekly Hours of Production and Nonsupervisory Employees: Manufacturing, Hours
R7	2	All Employees: Manufacturing, Thousands of Persons
R8	2	Nonfarm Business Sector: Real Output Per Hour of All Persons, Index 2009=100
R9	2	Gross Fixed Capital Formation in United States, Billions of United States Dollars

Note. The column "Trans." of the table indicates the transformation made to the corresponding variable prior to include it in the model. "Trans.=1" indicates that the variable is expressed in levels. "Trans.=2" indicates that the variable is expressed in growth rates.

Insights from this study:

- Financial cycles are smoother and longer than the macroeconomic [in both economies].
- Private sector liabilities have become increasingly determinant for the shape and evolution of financial cycles.
- Macro-financial interactions: steadily increased [EA] / oscillated [US].
- Over time, propagation of shocks increased in both directions in EA, but only from financial to real in the US.
- US hegemony in the spillovers between US and EA.
- Deterioration in EA financial or macroeconomic conditions results in a slight improvement in US financial conditions.
- The intensity in the transmission of shocks increases over time, at least until the Great Recession.
- Largest increase in transmission over time was from US financial to EA financial, followed by US real to EA financial.
- Results show that spillovers are not only asymmetric across sectors, but also across economies and time.

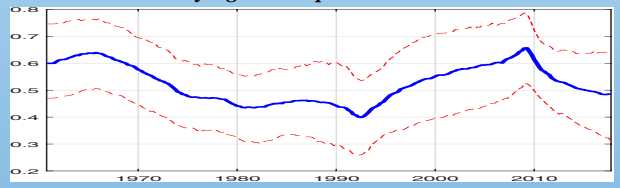
Cross-border impulse responses: US-to-Euro Area



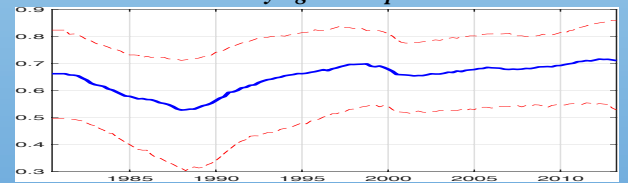
Global results

- The impact of **US shocks** is **much larger** than those coming from Euro Area.
- Shocks from **Euro Area** only have **transitory** (or very temporary) **effects**.
- The **effects** from a **US financial shock** turn even **negative**, which suggests of a type of substitution occurring between the two economies.
- **Our conclusion regarding US hegemony are solidified with the alternative identification schemes.**
- Real shocks generate higher impulse responses, at least on impact.
- **The intensity in the transmission of shocks increases over time**, at least until the Great Recession when impact of US shocks weakens and negative IRFs disappear.

US time-varying contemporaneous correlation



Euro Area time-varying contemporaneous correlation



Method

$$\begin{bmatrix} F_t^{US} \\ R_t^{US} \\ F_t^{EA} \\ R_t^{EA} \end{bmatrix} = \begin{bmatrix} \Lambda_{f,t}^{US} & 0 & 0 & 0 \\ 0 & \Lambda_{r,t}^{US} & 0 & 0 \\ 0 & 0 & \Lambda_{f,t}^{EA} & 0 \\ 0 & 0 & 0 & \Lambda_{r,t}^{EA} \end{bmatrix} \begin{bmatrix} f_t^{US} \\ r_t^{US} \\ f_t^{EA} \\ r_t^{EA} \end{bmatrix} + \begin{bmatrix} v_{f,t}^{US} \\ v_{r,t}^{US} \\ v_{f,t}^{EA} \\ v_{r,t}^{EA} \end{bmatrix}$$

$$\begin{bmatrix} f_t^{US} \\ r_t^{US} \\ f_t^{EA} \\ r_t^{EA} \end{bmatrix} = \Psi_{1,t} \begin{bmatrix} f_{t-1}^{US} \\ r_{t-1}^{US} \\ f_{t-1}^{EA} \\ r_{t-1}^{EA} \end{bmatrix} + \cdots + \Psi_{k,t} \begin{bmatrix} f_{t-k}^{US} \\ r_{t-k}^{US} \\ f_{t-k}^{EA} \\ r_{t-k}^{EA} \end{bmatrix} + \begin{bmatrix} u_{f,t}^{US} \\ u_{r,t}^{US} \\ u_{f,t}^{EA} \\ u_{r,t}^{EA} \end{bmatrix}$$

	Fin. Shock E.A.	Real Shock E.A.	Fin. Shock U.S.	Real Shock U.S.
Financial Cycle E.A.	+	+	*	+
Real Cycle E.A.	+	+	0	+
Financial Cycle U.S.	*	0	+	+
Real Cycle U.S.	0	0	+	+