

International Consumption Risk Sharing: The Role of Good and Bad Volatility

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Introduction

Motivation

I, ... , take, ... , you for my lawful wife/husband, to have and to hold from this day forward, for better, for worse, for richer, for poorer, in sickness and health, until death do us part.

- The two sides of the contract commit to be together in good and bad times. Yet, divorce is a phenomenon as common as marriage and divorce rates are indeed sensitive to economic downturns.
- We explore whether something similar occurs to countries.
- Hypothesis: good and bad volatility cross-spillovers do not only lead to asymmetric capital market integration dynamics, but also to asymmetric coupling-decoupling dynamics with respect to the global consumption risk-sharing patterns.

Introduction

Literature review

- Enabling consumption risk sharing among agents is a fundamental function of financial markets.
- Standard theories in international finance (Obstfeld and Rogoff, 1996) predict perfect international consumption risk sharing under capital markets perfectly integrated.
- The literature has therefore devoted considerable efforts to test for the presence of international consumption risk sharing in the data (Cochrane, 1991; Mace, 1991; Obstfeld, 1994; Sorensen and Yosha, 2000; Sorensen et al., 2007; Kose et al., 2009; Islamaj and Kose, 2016; Rangvid et al., 2016 and Fuleky et al., 2015)

Introduction

Contribution

Two **contributions**:

- To explore the impacts of capital market integration on the cross-sectional and time-series dynamics of international consumption risk sharing, distinguishing between good and bad capital market integration by the first time.
- To propose new measures of good and bad capital market integration, and to provide indices of the exposure of each individual country consumption growth to the general pattern of risk sharing.

Methodology

- Indices of asymmetric capital market integration
- Country specific indices of consumption risk sharing
- Consumption risk sharing and the effects of good and bad capital market integration

Methodology

Indices of Asymmetric Capital Market Integration

- We estimated good and bad volatilities using realized semivariances (Barndorff-Nielsen et al., 2010)
- We constructed good and bad total cross-spillovers for the two systems and good and bad net spillovers for each country in the spirit of Diebold and Yilmaz (2012, 2014).
- We constructed our two measures of capital market integration (good and bad).

Methodology

Indices of Asymmetric Capital Market Integration: Good and Bad Volatility Estimation

The RV estimator of log returns can be expressed as:

$$RV = \sum_{j=1}^n (Y_{t_j} - Y_{t_{j-1}})^2$$

Barndorff-Nielsen et al. (2010) propose a new RS estimator as follows:

$$RS^- = \sum_{j=1}^{t_j \leq 1} (Y_{t_j} - Y_{t_{j-1}})^2 \mathbf{1}_{Y_{t_j} - Y_{t_{j-1}} \leq 0}$$

$$RS^+ = \sum_{j=1}^{t_j \leq 1} (Y_{t_j} - Y_{t_{j-1}})^2 \mathbf{1}_{Y_{t_j} - Y_{t_{j-1}} \geq 0}$$

where $\mathbf{1}_y$ is an indicator function taking the value of 1 if the argument y is true

Methodology

Indices of Asymmetric Capital Market Integration: Total and Net Spillovers

Our good and bad spillover indices were built on two VAR systems, and were drawn from associated FEVD statistics. The errors were estimated from the MA representation of the VAR as follows:

$$X_t = \Theta(L)\varepsilon_t$$

$$X_t = \sum_{i=0}^{\infty} A_i \varepsilon_{t-i}$$

Naturally $X_t = RS_t^+$ or $X_t = RS_t^-$ for the good and bad volatilities systems, respectively.

Methodology

Indices of Asymmetric Capital Market Integration: Total and Net Spillovers

Total spillover index:

$$C(H) = \frac{\sum_{i,j=1, i \neq j}^N \tilde{\theta}_{ij}(H)}{\sum_{i,j=1}^N \tilde{\theta}_{ij}(H)} \times 100$$

Directional spillovers indexes:

$$C_{i \leftarrow j}(H) = \frac{\sum_{j=1, i \neq j}^N \tilde{\theta}_{ij}(H)}{\sum_{i,j=1}^N \tilde{\theta}_{ij}(H)} \times 100$$

$$C_{i \rightarrow j}(H) = \frac{\sum_{j=1, i \neq j}^N \tilde{\theta}_{ji}(H)}{\sum_{i,j=1}^N \tilde{\theta}_{ij}(H)} \times 100$$

Net spillover index:

$$C_i(H) = C_{i \rightarrow j}(H) - C_{i \leftarrow j}(H)$$

Methodology

Indices of Asymmetric Capital Market Integration: Two Measures of Capital Market Integration

A measure of the total interaction of a given market with the rest of the system can be constructed by replacing the negative sign in last equation with a positive one, as follows:

$$I_i(H) = C_{i \rightarrow j}(H) + C_{i \leftarrow j}(H)$$

Dynamics are introduced by estimating gross and net spillovers as well as capital market integration statistics using rolling windows in the estimation procedure.

Methodology

Country Specific Indices of Consumption Risk Sharing

The most traditional measure of time-varying consumption risk sharing in the literature is:

$$\Delta c_{i,t} - \overline{\Delta c}_t = \alpha + \beta(\Delta y_{i,t} - \overline{\Delta y}_t) + \varepsilon_{i,t}$$

where

- $\Delta c_{i,t}$ is the real consumption growth rate of country i in period t
- $\overline{\Delta c}_t$ is the global real consumption growth rate in period t
- $\Delta y_{i,t}$ is the real income growth rate of country i in period t
- $\overline{\Delta y}_t$ is the global real income growth rate in period t

β measures the relationship between idiosyncratic consumption growth and idiosyncratic income growth.

Methodology

Country Specific Indices of Consumption Risk Sharing

To analyze coupling (or decoupling) processes between the global trend (cycle) of consumption risk sharing and the consumption pattern of individual countries, we estimated the following time varying relationship for each country:

$$\Delta c_{i,s} - \overline{\Delta c_s} = a_{i,s} + b_{i,s} crs_s + u_{i,s}$$

- for $i = 1, \dots, N$ and $s = t + w$, where $t = 1, \dots, T$ and w is the length of the window.
- crs_s stands for consumption risk sharing and is calculated as $crs_s = 100 - 100 * \beta_t$, so that higher levels imply more risk sharing
- b measures the exposure of idiosyncratic consumption of country i to the general pattern of consumption risk sharing.

Methodology

Consumption Risk Sharing and the Effects of Good and Bad Capital Market Integration

Given that $b_{i,s}$ is time varying itself, we can now proceed to analyze whether the benefits obtained via consumption risk-sharing change, in an asymmetric fashion, following good or bad interactions with the global financial markets. To this end, we estimated a panel regression.

Data

Markets: Australia, Austria, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Norway, Singapore, Spain, Sweden, Switzerland, The Netherlands, United Kingdom, and United States.

Stock markets:

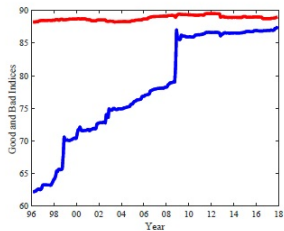
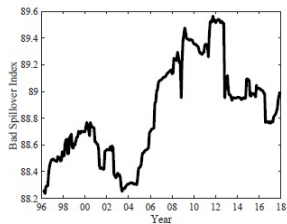
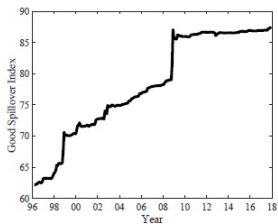
- MSCI indexes provided by Thomson Reuters
- Sample period: 1970 to 2017.
- Daily frequency

Real consumption and real income:

- Provided by Thomson Reuters
- Sample period: 1996 to 2017.
- Quarterly frequency

Results

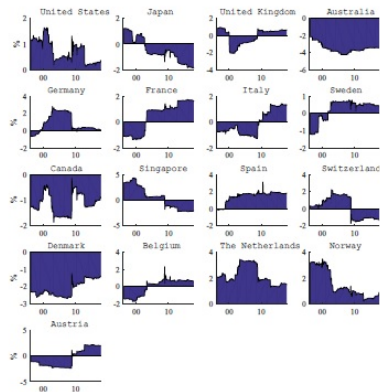
Good and Bad Volatility Cross-Spillovers in the Global Stock Market



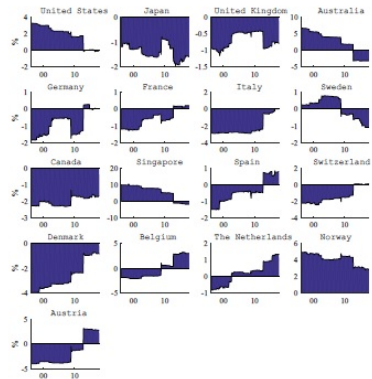
Results

Net Good and Bad Volatility Cross-Spillovers for each market

Net Good Volatility Shocks



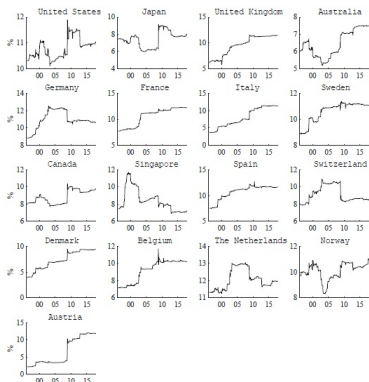
Net Bad Volatility Shocks



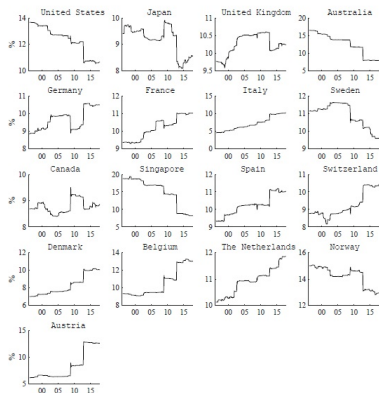
Results

Index of Capital Market Integration Constructed with Good and Bad Volatility Shocks

Good capital market integration

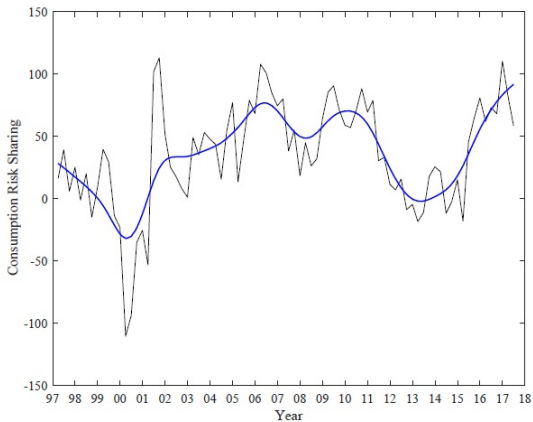


Bad capital market integration



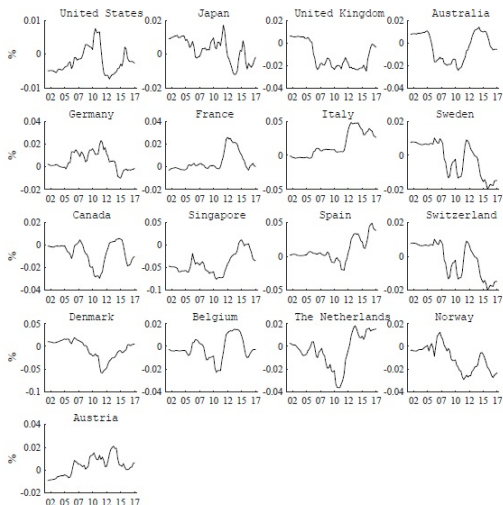
Results

Cycles of Consumption Risk Sharing in the Global Economy



Results

Time-Varying Exposure to Global Risk Sharing by Country



Results

Consumption Risk Sharing and Good and Bad Capital Market Integration

	Consumption risk-sharing
Constant	1.357** (0.528)
Bad capital market integration	-0.275*** (0.073)
Good capital market integration	0.175*** (0.067)
CAPM absolute residuals	-1.450 (0.943)
Trade openness (in diff.)	-0.618 (0.703)
Narrow bands indicator	0.553** (0.252)
Managed-floats indicator	-1.152*** (0.257)
Free-floating indicator	-0.161 (0.307)
N=1,069 R=0.283	

Conclusions

How does capital market integration impact on consumption risk sharing?

- The answer depends on the decomposition of capital market integration into good and bad integration.
- While there is a decoupling of individual consumption growth from global risk sharing after episodes of negative cross-spillovers, we observe a recoupling after positive ones.
- Decoupling is more likely to occur when things are going bad, than when past and present prospects are good.
- The risk sharing benefits of international financial integration are more apparent in good times.

Thank you for your attention!