Business cycle symmetry and risk sharing - the Caribbean as an OCA?

REGAN DEONANAN
SEPTEMBER 15TH, 2011

Motivation – Big picture

1. Historic and recent interest by Caribbean countries in forming monetary union (ie. OCA)
   - OCA benefits: lowering transactions costs → increasing trade
   - OCA costs: must give up control over interest/exchange rates
   - Integration/co-operation of region imperative to future economic survival due to small size of candidate countries

2. Caribbean focus on OCA formation not unique
   - Asia - ASEAN+3 moving towards Asian Economic Community (AEC) by 2015
   - South America – UNASUR propose monetary union by 2019
   - Middle East – GCC initially proposed monetary union in 2010

Motivation - Big picture

Policymakers currently questioning nature and type of integration needed given EU and global difficulties

- "But with the challenges unfolding today globally, we will have to slow the pace a bit and take a much more realistic perspective of where we have to go in the integration movement." - Dr. Denzil Douglas, July 2011

Indicative of need for continuing research aimed at addressing where do we go as a region

What I do

1. Take stock of where we are
    1. Start from last proposal – forming monetary union
2. Central questions
    1. From a positive viewpoint, can the Caribbean form a viable OCA?
    2. How does it compare to other proposed unions?
3. Empirical investigation
    1. Assess degree of business cycle symmetry among proposed OCAs and EU
    2. Get a sense of how costly union would be
    3. Builds on previous work by applying newer methods

Previous Literature

Ghartey (2008) examined business cycle symmetry using VECM model

- Isolated supply and demand shocks
- Looked at correlation – low for some countries
- Shocks driving business cycle different

Useful/valiant attempt but

- No OCA perfect – how far?
- Cannot address source of shocks

Builds on prior work by examining bc symmetry from different perspective

- Global, regional and country-specific factors driving each country

Business cycle symmetry - Intuition

1. Perfectly symmetric business cycles – 2 countries
   - Response of common central bank would be same as independent central banks
   - No welfare loss from losing independence

2. Asymmetric business cycles – 2 countries
   - Country 1 experiencing a boom, country 2 a recession
   - Country 1 would like high interest rates to control inflation
   - Country 2 would like low interest rates to stimulate investment
   - A common central bank setting interest rates between these extremes means neither achieves objectives
   - Loss in independence now represents loss in welfare
   - Size of loss in welfare is greater the more asymmetric the two countries business cycles

3. Takeaway – for OCA to be viable
   - Need for business cycle symmetry
   - Less loss in welfare

Empirical Methodology - intuition

Business cycles driven by 3 influences: Global, regional, country-specific

If driving forces similar, then business cycle similar

Degree of similarity given by: % growth driven by common factors

- Example: if common influences account for 80% of growth in 2 countries vs. 20% for 2 other countries, first group more similar

Empirical Methodology - Symmetry

Dynamic factor model – unobserved latent factors

- Three shocks (latent factors) affecting output growth in each country: global, regional, country-specific

$$y_{i.t} = \lambda_i^g f_t^g + \lambda_i^r f_{j,t}^r + \varepsilon_{i,t}$$

- Latent factors are orthogonal to each other and follow AR processes

$$f_t^g = \rho_1^g f_{t-1}^g + \rho_2^g f_{t-2}^g + \eta_t^g$$

$$f_{j,t}^r = \rho_{1,j}^r f_{j,t-1}^r + \rho_{2,j}^r f_{j,t-2}^r + \eta_{j,t}^r$$

$$\varepsilon_{i,t} = \rho_{1,i}\varepsilon_{i,t-1} + \rho_{2,i}\varepsilon_{i,t-2} + \eta_{i,t}$$

- Assume: $\eta_{i,t}$ $\eta_{j,t}^r$ η_t^g follow $N(0,\sigma_i^2)$ $N(0,\sigma_{r,j}^2)$ $N(0,\sigma_g^2)$

- Latent factors are uncorrelated at all leads and lags

$$E(\eta_t^g \eta_{t-s}^g) = E(\eta_{j,t}^r \eta_{j,t-s}^r) = E(\eta_{i,t}\eta_{i,t-s}) = 0$$

Empirical Methodology - Symmetry

1. Estimate factors and parameters
2. Decompose output growth into portions attributable to each factor

$$\theta_i^g = \frac{(\lambda_i^g)^2 \operatorname{var}(f_t^g)}{\operatorname{var}(y_{i,t})}$$

   - where $\operatorname{var}(y_{i,t}) = (\lambda_i^g)^2 \operatorname{var}(f_t^g) + (\lambda_i^r)^2 \operatorname{var}(f_{j,t}^r) + \operatorname{var}(\varepsilon_{i,t})$

1. Intuition
   - The greater the amount of output growth attributable to common factors, the greater business cycle symmetry among candidates

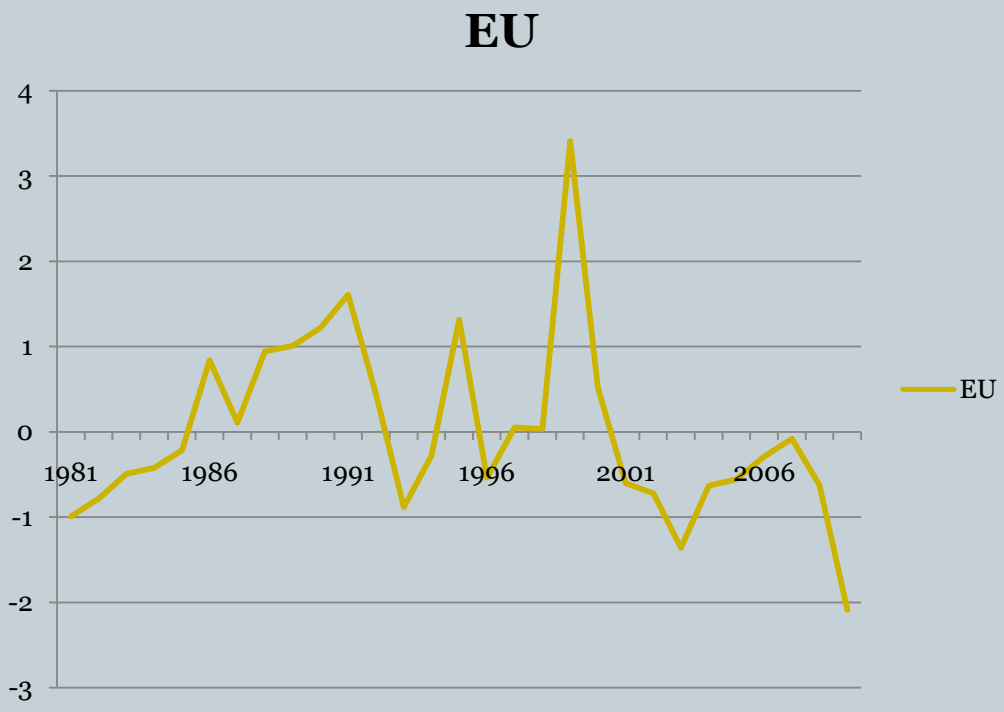
Empirical Methodology - Symmetry

1. Include 6 regions in model:
    1. NAFTA, EU, CSME, UNASUR, GCC, ASEAN+3
    2. 60 countries over 1986-2009
    3. Data taken from WEO, WDI, IFS (annual)

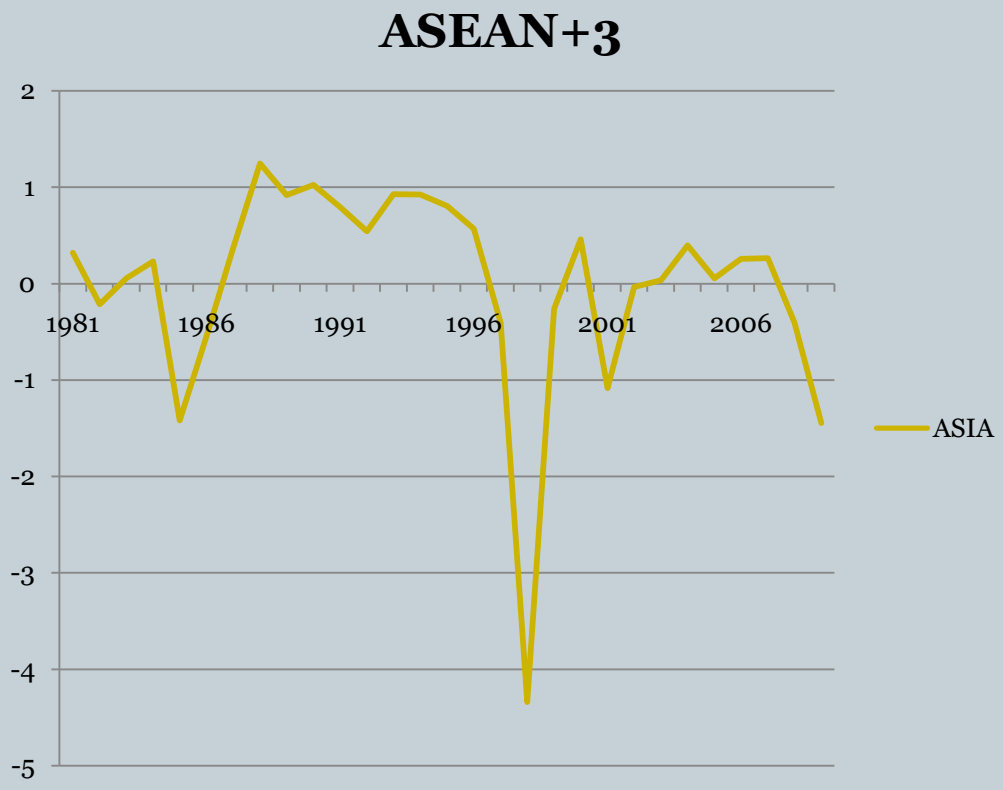
2. Two periods
    - Pre-EU: 1986-1998
    - Post-EU: 1999-2009

Results 1 – Estimated Factors

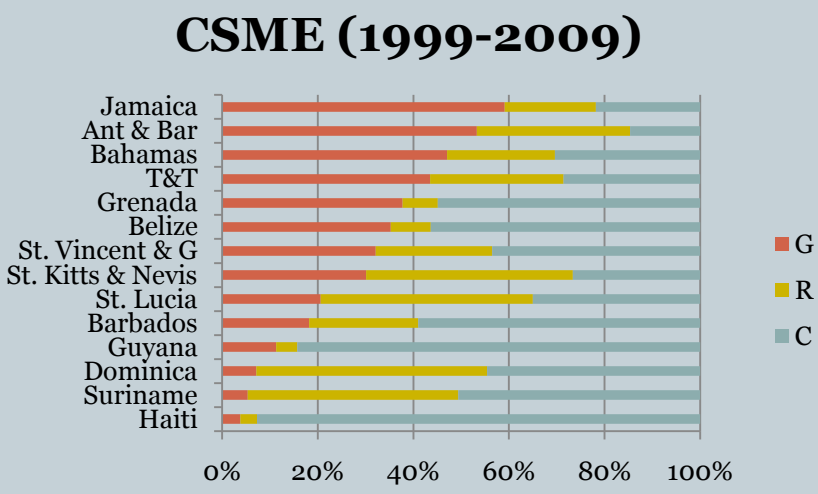
Results 1– Estimated Factors

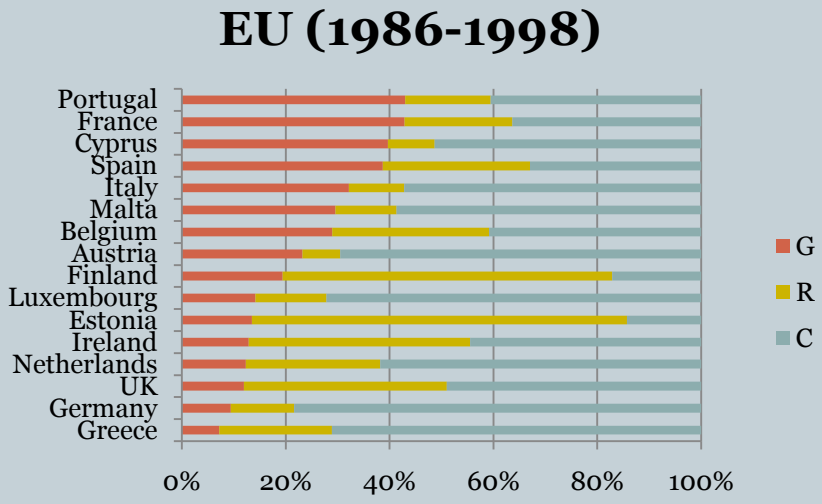


Results 1– Estimated Factors

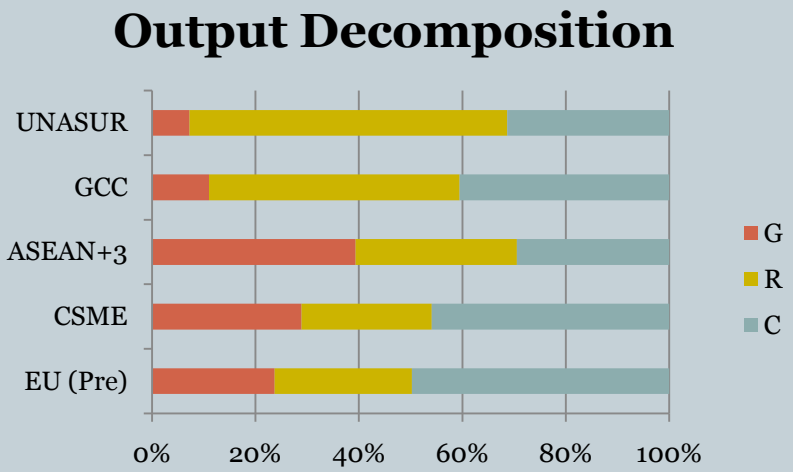


Results 2– Output Decomposition: Caribbean vs EU



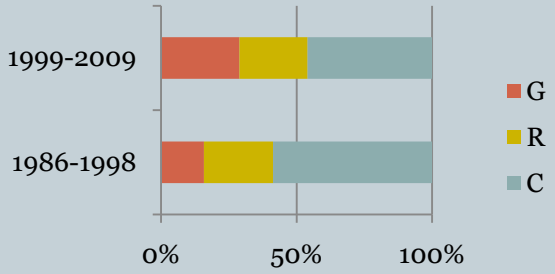


Results 3– Decompositions: average for all OCAs

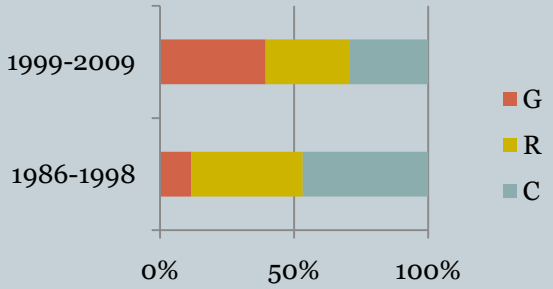


Results 4– Comparing proposed OCAs across periods

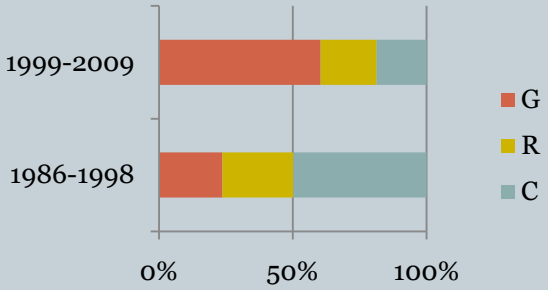
CSME



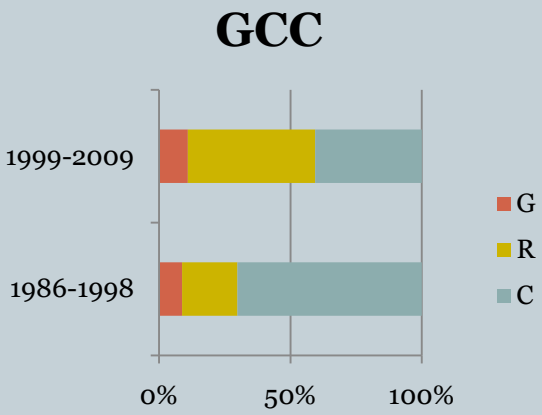
ASEAN+3

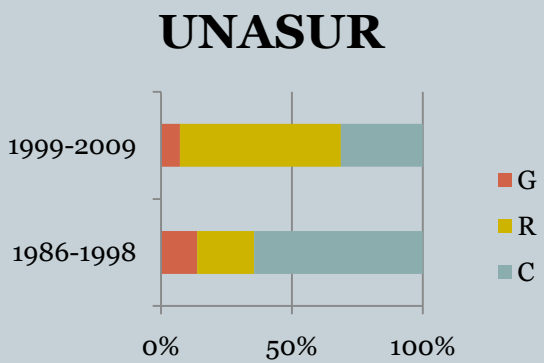


EU



Results 5– Comparing proposed OCAs across periods





Takeaways

1. Proposed OCAs just as symmetric in post period as EU in pre period

2. Caribbean experience resembles that of ASEAN+3 and EU

3. GCC and UNASUR experience was very different – regional factor more prominent

Related Literature

1. Ghartey – Economic Studies of International Development, 2008
    1. Investigates Caribbean as a potential OCA
    2. Uses correlation of demand and supply shocks among members to assess symmetry
2. Nguyen – DEPOCEN, 2008
    - Investigates ASEAN+3 countries as potential OCA
    - Uses dynamic factor model with many regions
3. Kose, Otrok, Whiteman (KOW) – AER, 2003
    - Study prevalence of world and regional business cycles
    - Use dynamic factor model with many regions