**Motivations**

- The "world interest rate" is a reflection of this broad global price of capital and plays a central role in open-economy macroeconomics.
- How does the world interest rate look like?
- Neither a weighted average nor a simple dynamic factor model provides satisfactory measure of the world interest rate.
- What can we learn from the world interest rate?

**Main Takeaways**

- Adopts a two-level dynamic factor model and obtains both global and regional factors from over 70 countries across the world.
- To select the best model, we try a variety of groupings according to geography, exchange rate anchors, or level of economic development.
- Propose practical rules of groupings for practitioners using multi-level dynamic factor models that help guide other analysis.
- The global rate is on a long run secular downward trend. It is lined up with the movement of the world asset prices.
- The U.S. rate plays an important role on the world rate, but U.S. rates do not pass fully or immediately into the world rate.
- The world interest rate plays a major role in countries' interest rates, but also that regional and local factors matter.
- Capital account openness strongly affects both the co-movements of local-regional and local-world rates.

**Model and Groupings**

Model:

\[ Y_t = \beta F_t + \Gamma_t \]

\[ \Gamma_t = W(L)\Gamma_{t-1} + U_t \]

\[ F_t = \delta(L)F_{t-1} + V_t \]

- \( F = [F_{world}, F_{regional}] \), \( \Gamma_t \) is the idiosyncratic component.
- Estimation is based on Bayesian methods in Jackson et al. (2016), variance decomposition follows Del Negro and Otrok (2007).
- Data spans from 1996Q2 to 2016Q4, with 74 countries in the sample.

**Grouping Methods**

**model 1**: One global factor

**model 2**: Two global factors

**model 3**: EU and nonEU

**model 4**: EU, nonEU OECD, and other

**model 5**: EU, nonEU OECD, and Latin America Emerging, Asian Emerging, and other

**model 6**: EU OECD, nonEU OECD, EU Emerging, Latin America Emerging, Asian Emerging, and other.

**model 7**: random grouping based on model 6

**model 8**: Dollar base, Euro base, and other

**model 9**: random grouping based on model 8

**model 10**: Dollar base, EU, and other

**model 11**: Dollar base non peg, Dollar base peg, Euro base peg, Euro base non peg, and other

**model 12**: Dollar base non peg OECD, Dollar base non peg Emerging, Dollar base peg, Euro base non peg, and other

**model 13**: random grouping based on model 12

We assume a model is preferred if it substantially reduces the average share of variance explained by idiosyncratic factors. Model 8 gives the best results. Robustness based on GDP or capital control weighted idiosyncratic factors.

**Movements of the World Interest Rate**

<table>
<thead>
<tr>
<th>Model</th>
<th>Correlation with German rate</th>
<th>Correlation with US rate</th>
<th>Correlation with Germany rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 global factor</td>
<td>0.92</td>
<td>0.78</td>
<td>0.94</td>
</tr>
<tr>
<td>2 regional factors (regional grouping)</td>
<td>0.70</td>
<td>0.88</td>
<td>0.50</td>
</tr>
<tr>
<td>3 regional factors (regional grouping)</td>
<td>0.61</td>
<td>0.93</td>
<td>0.79</td>
</tr>
<tr>
<td>5 regional factors (regional grouping)</td>
<td>0.59</td>
<td>0.95</td>
<td>0.78</td>
</tr>
<tr>
<td>6 regional factors (regional grouping)</td>
<td>0.63</td>
<td>0.94</td>
<td>0.79</td>
</tr>
<tr>
<td>7 random regional factors</td>
<td>0.97</td>
<td>0.64</td>
<td>0.94</td>
</tr>
<tr>
<td>3 regional factors (base country grouping)</td>
<td>0.72</td>
<td>0.51</td>
<td>0.72</td>
</tr>
<tr>
<td>5 random regional factors</td>
<td>0.97</td>
<td>0.62</td>
<td>0.94</td>
</tr>
<tr>
<td>1 global factor (OECD only)</td>
<td>0.98</td>
<td>0.62</td>
<td>0.92</td>
</tr>
<tr>
<td>1 global factor (Dollar base only)</td>
<td>0.63</td>
<td>0.96</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Table 1: Correlations with the world interest rate

**Figure 1: Scanged world interest rate (Model 8)**

**Figure 2: Impulse response to 1% shock on the US rate**

**Table 2: Correlations (Model 8)**

- Following Del Negro and Otrok (2007), scale the world interest rate with the nominal GDP.
- Estimate a proxy VAR model using the high frequent FF4 as the instrument of the US rate.

**Factor Shares and the Open Economy Trilemma**

<table>
<thead>
<tr>
<th>Model</th>
<th>Euro base non peg OECD</th>
<th>Euro base non peg Emerging</th>
<th>Dollar base non peg OECD</th>
<th>Dollar base non peg Emerging</th>
<th>Dollar base peg OECD</th>
<th>Dollar base peg Emerging</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 iid</td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.05)</td>
<td>(0.07)</td>
<td>(0.09)</td>
</tr>
<tr>
<td>Shambaugh peg</td>
<td>0.08</td>
<td>0.07</td>
<td>0.02</td>
<td>0.06</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>IRR peg</td>
<td>0.10 ( ^{**} )</td>
<td>0.09 ( ^{**} )</td>
<td>0.12 ( ^{**} )</td>
<td>0.09 ( ^{**} )</td>
<td>0.10 ( ^{**} )</td>
<td>0.10 ( ^{**} )</td>
</tr>
<tr>
<td>constant</td>
<td>0.26 ( ^{**} )</td>
<td>0.26 ( ^{**} )</td>
<td>0.28 ( ^{**} )</td>
<td>0.20 ( ** )</td>
<td>0.29 ( ** )</td>
<td>0.20 ( ** )</td>
</tr>
<tr>
<td>N</td>
<td>59.8</td>
<td>59.8</td>
<td>59.8</td>
<td>59.8</td>
<td>59.8</td>
<td>59.8</td>
</tr>
</tbody>
</table>

Table 3: Regressions on factor shares (Model 6)

**Table 4: Regressions on factor shares (Model 8)**