

Discussion of Cayen, Coletti, Lalonde and Maier's

**"What Drives Exchange Rates?  
New Evidence from a Panel of U.S. Dollar  
Bilateral Exchange Rates"**

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- ▶ Finds 2 common factors
  - ▶ the first is cointegrated with U.S. public debt
  - ▶ the second is cointegrated with commodity prices
- ▶ Incorporates these long-run relationships into a state-space mode, which is used to decompose the historical variations in bilateral ER

# Findings

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- ▶ Commodity prices and domestic factors are also important to account for movements in the Canadian dollar and the Yen vis-à-vis the U.S. dollar

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- ▶ By construction, one should uncover a "U.S. common factor"
- ▶ Extend the information set to allow for other non-U.S. bilateral ER

## Information Set Used in the Common Factor Analysis

- ▶ To relate the U.S. common factor to an observable measure, the authors extract the common factor of the debt/gdp ratios of the different countries relative to the U.S.

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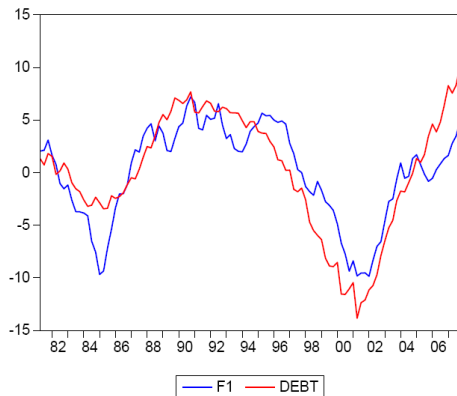
- ▶ To relate the U.S. common factor to an observable measure, the authors extract the common factor of the debt/gdp ratios of the different countries relative to the U.S.
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- ▶ Why not perform factor analysis on an extended vector  $X_t$  that includes these series (and other potential candidates) in addition to ER?
- ▶ This may help with the interpretation of factors

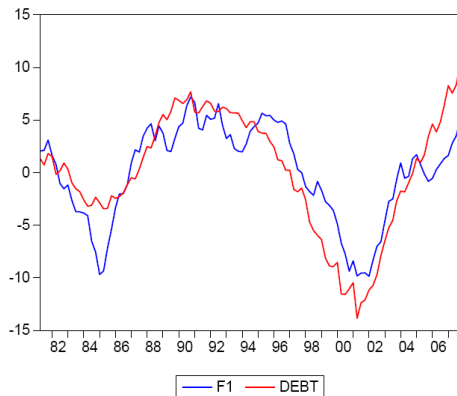
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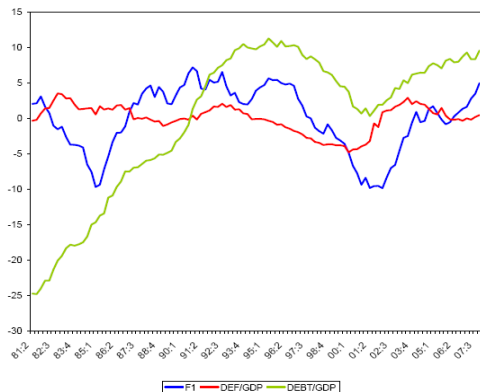
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- ▶ But the "U.S. debt common factor" itself needs an interpretation !

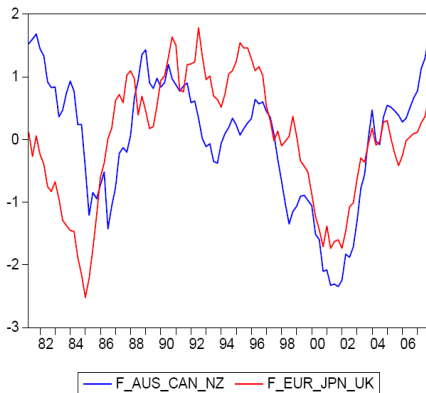
# Interpretation of Common Factors

- ▶ The "U.S. debt common factor" does not seem to be related to U.S. fiscal deficit or public debt



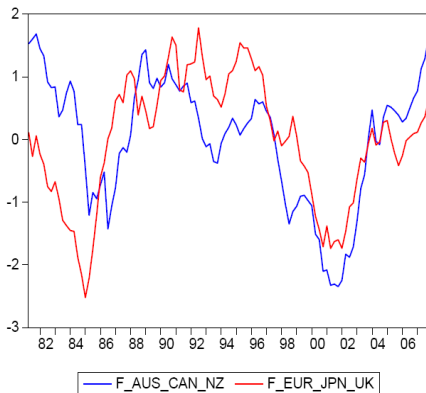
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- ▶ Correlation b/w these two factors is only 0.49

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- ▶ If the first common factor truly represents the U.S. fiscal position, then it seems odd that this construct is orthogonal to commodity prices
  - ▶ Higher oil prices lower labor income and corporate profits, implying lower taxes and a larger deficit
  - ▶ Commodity prices and the U.S. fiscal deficit could be jointly driven by a third factor (China !)

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	Unrotated			Rotated	
	F1	F2		F1	F2
AU	x	x	⇒	AU	x
CA	x	x		CA	x
NZ	x			NZ	x
EU	x	x		EU	x
JA	x			JA	x
UK	x			UK	x

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- ▶ They then cumulate the factor scores to construct the common factors underlying the *levels* of the real exchange rates
- ▶ Given that factor analysis cannot be performed for non-stationary data (since it examines the pattern of covariances), what is the significance of the constructed common factors?

# Model Validation and Sampling Uncertainty

- ▶ How well does the SS model fit the data

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- ▶ How well does the SS model fit the data
- ▶ Compare its forecasting performance with naive statistical models: AR(1) and random walk

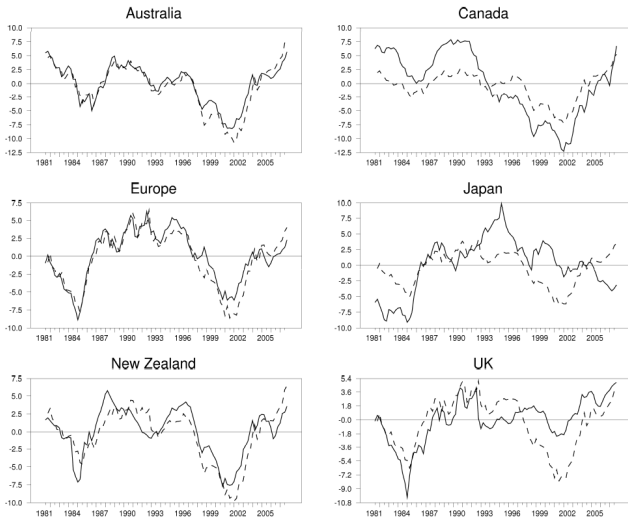


Figure: One step ahead forecasts of the SS model

# Model Validation and Sampling Uncertainty

## RMSE of one-step-ahead forecasts

	Australia	Canada	Europe	Japan	N.Z.	U.K.
SS Model	1.452	<b>3.872</b>	1.433	<b>4.055</b>	2.024	2.949
AR(1)	0.994	<b>1.001</b>	0.979	<b>0.983</b>	0.990	0.970
Random walk	1.004	<b>1.005</b>	0.987	<b>0.992</b>	1.000	0.980

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- ▶ It would be useful to report confidence intervals to account for the uncertainty attached to the conditional expectations computed from the Kalman filter

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# Conclusion

- ▶ Factor analysis can be useful to project a large set of exchange rates on a small number of latent variables that account for their covariances
- ▶ However, relating these latent factors to traditional fundamentals seems to be a nonstarter (especially, if the purpose is to build an empirical model that accounts for high-frequency movements in ER)
- ▶ Alternative avenues: changes in expectations, order flow, ...