

Modeling Colombian yields with a macro-factor affine term structure model

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Research practise 3: Progress presentation

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Context

Model the yield curve using an ATSM with macro-factors.

ATSMs:

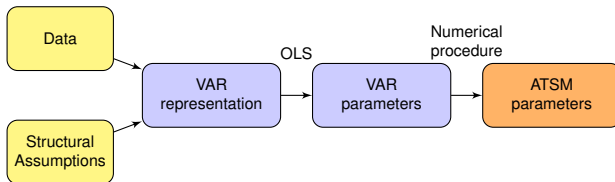
- Consistent with theory
- Very hard to estimate

Using monthly Colombian data from 2005 to 2015.

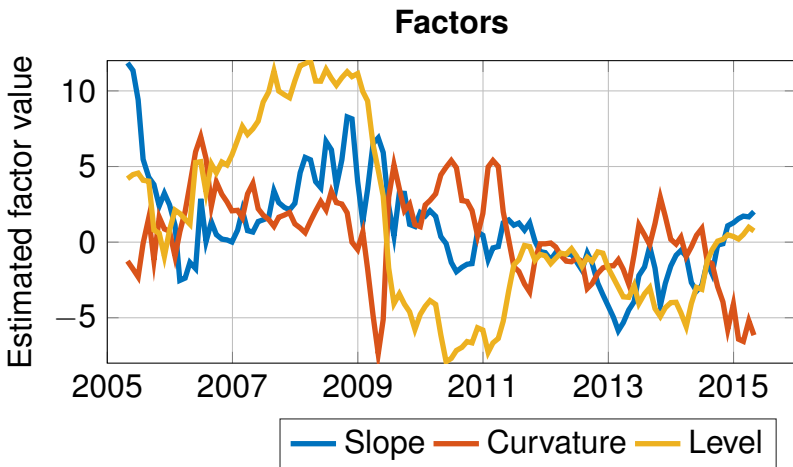
Methodology

[Hamilton and Wu, 2012] show that:

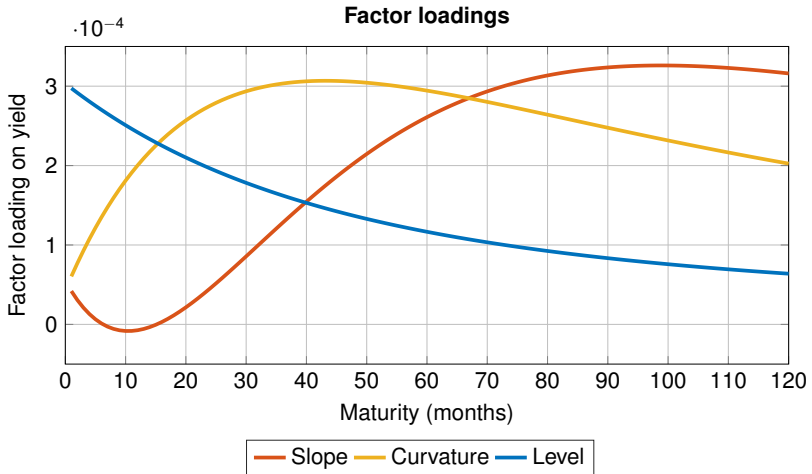
- Discrete ATSMs can be *mapped* to VAR's.
- You can estimate a VAR and recover the ATSM parameters.



Factor dynamics

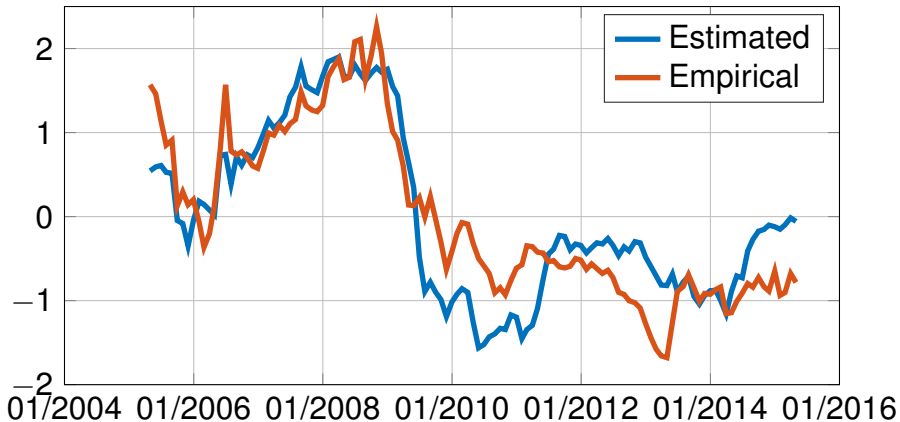


Factor loadings



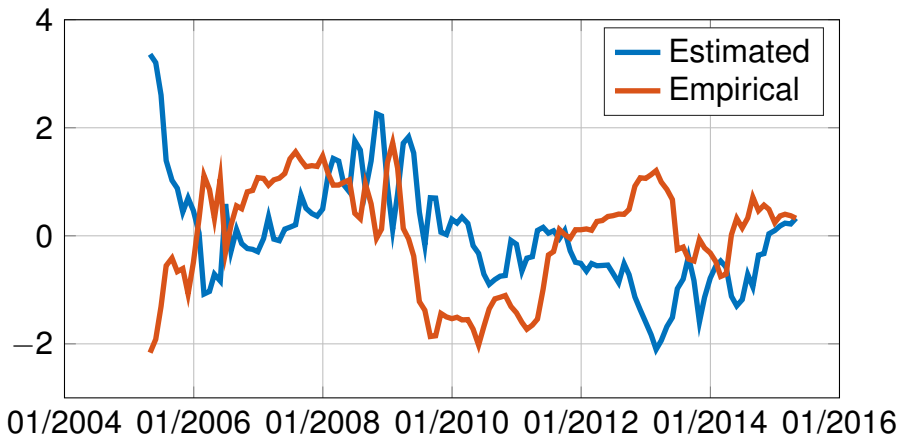
Empirical factors

Level



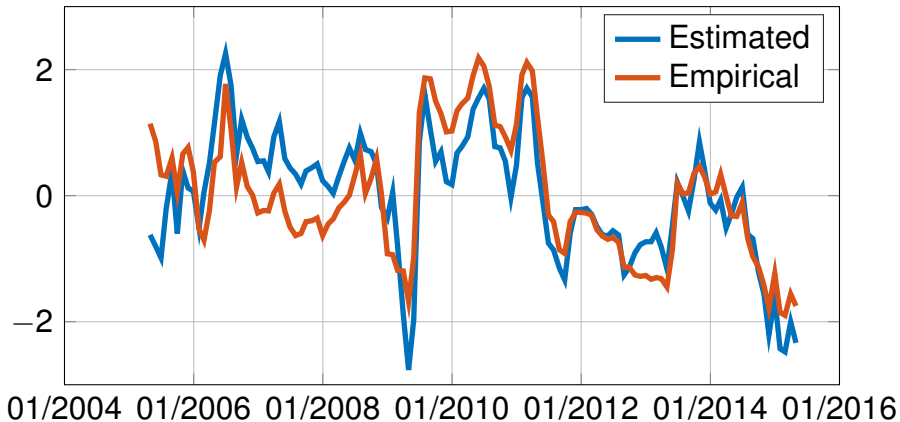
Empirical factors

Slope

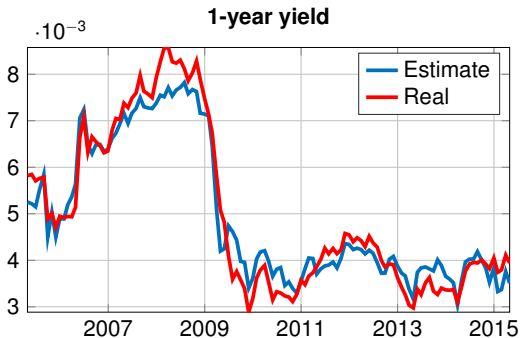


Empirical factors

Curvature



Estimated yield



Factors

Included in pairs:

- IMACO
- IPC
- USD/COP
- IBR
- CDS 5y
- VIX
- Oil price
- Monetary base

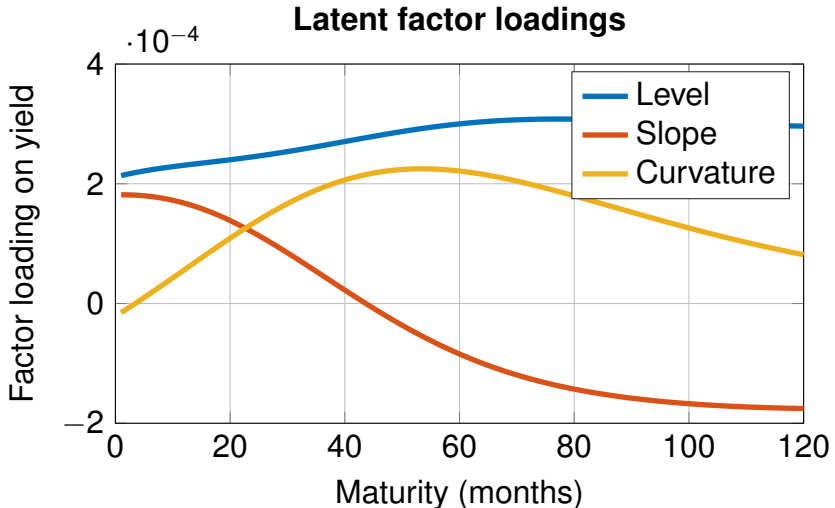
Rotation problem

Latent factors can be freely rotated.

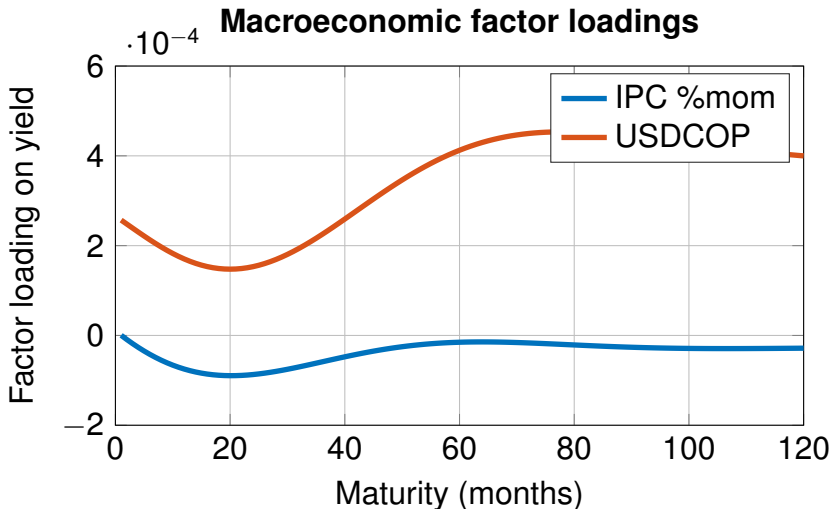
Solution: *Procrustes analysis* rotates factors to match a pattern.

	Level	Slope	Curvature
Short yield	1	1	1
Mid yield	1	0	0
Long yield	1	-1	1

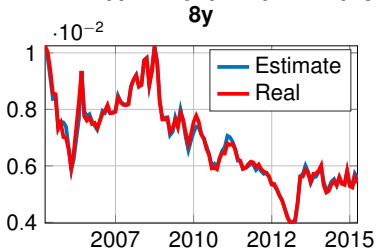
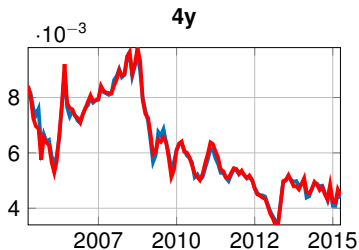
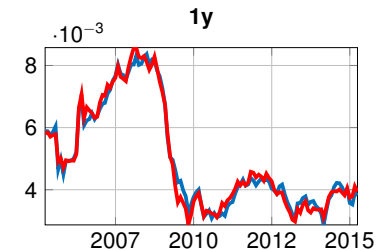
Factor loadings



Factor loadings



Estimated yields



Remaining work

- Estimate all possible combinations of macro-factors
- Rank models according to their fit
- Interpret and compare the best models

References



Hamilton, J. D. and Wu, J. C. (2012).

Identification and estimation of gaussian affine term structure models.

Journal of Econometrics, 168(2):315–331.

Thanks for your attention!