Banks' Net Interest Margin and changes in the term structure

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The views expressed in this presentation are those of the author and do not necessarily reflect the views of the National Bank of Belgium

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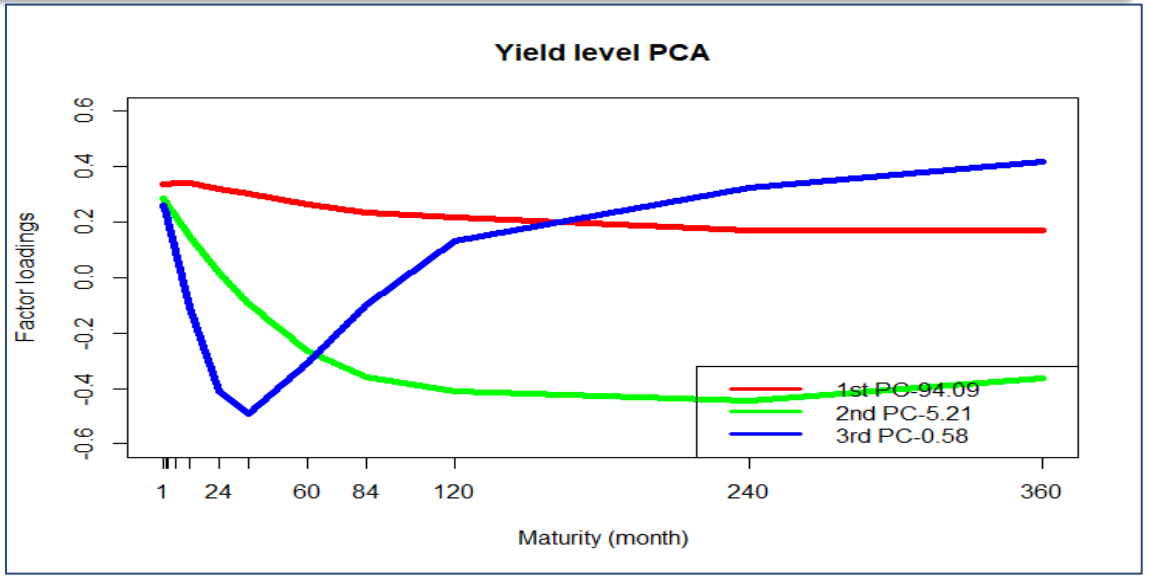
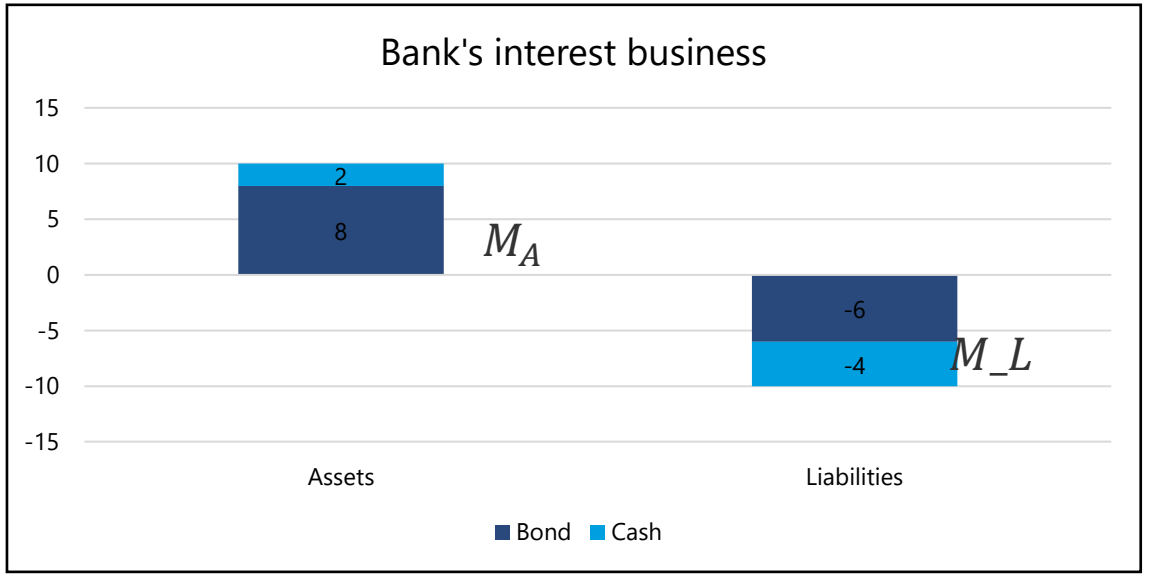
Short summary of the paper

- Paper combines:
  - factor model for the yield curve
  - Simplified model of the bank's interest business based on a passive replication strategy
- Combination of both models gives a formula of the changes of the NIM after an interest rate shock (Stress test)

$$C.NIM_i(T) = \phi_{A,i} \cdot min\left(\frac{T}{M_{A,i}}, 100\%\right) \cdot (\beta_{0,t_0} + \beta_{1,t_0} M_{A,i}) - \phi_{L,i} \cdot min\left(\frac{T}{M_{L,i}}, 100\%\right) \cdot (\beta_{0,t_0} + \beta_{1,t_0} M_{L,i})$$

- Paper tests this formula empirically thanks to a quantitative survey covering small and medium size German banks





Comments and suggestions (I)

- Paper should be more explicit about the application in stress testing :
  - Give an example how the framework that was presented can be used for stress testing purposes
  - Use the quantitative survey data to back test the prediction that were provided by their model
  - Potentially expend the model with macro factor similar to the approach of Diebold, Rudebusch, Aruoba (2006)

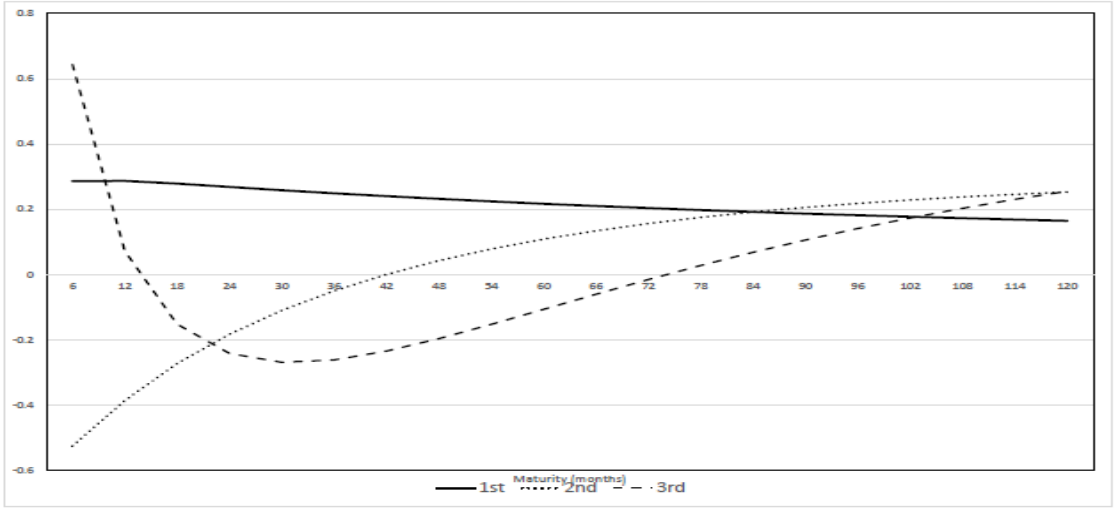
- In my view, the model of the bank's interest rate business lacks some flexibility in the context of a stress test
  - Banks adjust the average maturity of their assets and liability after an interest rate shock, constant maturity of assets and liability is a strong assumption
  - Banks should have some adjustment variables after the shock. For example, in the EBA stress tests banks use margins (price channel) to react to the interest rate shock

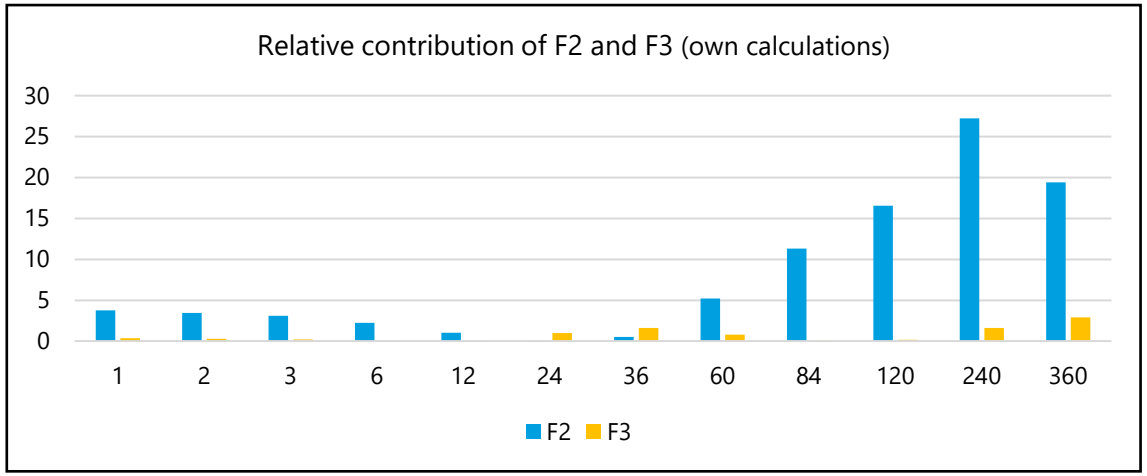
Comments and suggestions (II)

Table 7: Different models: coefficient of determination

Coefficient of determination	Change horizon		
	1 month	3 months	12 months
Parallel shift (see Eq. (6))	81.47%	86.73%	88.14%
Two factors (see Eq.(7))	90.61%	95.49%	97.47%
Three factors (see Eq. (8))	97.13%	97.80%	98.35%

- Curvature (factor 3) is usually more relevant for the mid-range maturities. Propose you also show longer maturities in your table 6/7
- Include a discussion regarding the impact of limiting your model to two factors for the mid-range maturities





Comments and suggestions (III)

$$F_{t,i} = -50 \cdot \frac{r_t(m_1) - r_t(m_2)}{m_1 - m_2} \cdot IRR_{t,i}$$

- The paper uses a grid search algorithm to identify m_1 and m_2
- Extend the size of your grid beyond 400
- Major drawback of this algorithm is that the solution might not be unique. This need to be checked

- Case iii): $M_{A,i} < T$

$$C.NIM_i(T) = (\phi_{A,i} - \phi_{L,i})\,\beta_{0,t_0} + (M_{A,i}\phi_{A,i} - M_{L,i}\phi_{L,i})\,\beta_{1,t_0}$$

- Empirical part tests the long term impact of the shock on CNIM (T> M_A) . However, M_A is assumed to be 5 years = Tmax.
- The paper needs to justify the assumption about the duration of assets. What would be the alternative if you use the balance sheet structure (equation 19) ?
- Try to estimate the model based on equation 14 (medium term) $M_L <$ T< M_A as this would be more realistic in my views

Other comments and suggestions

- Your central assumption that banks interest income can be modelled by a passive strategy is not valid according to your empirical testing (beta <> 1). What are the consequence for your model ? I suggest to include a discussion of the implication that the model does not capture all the aspect of the banks business.

- The model used for the bank's interest business does not capture in my view the hedging the maturity gap using derivatives. Is this important for your sample of banks ? I think this might explain why your assumptions are not valid empirically