Discussion of European Bond ETFs - Tracking Errors and the Sovereign Debt Crisis

Milan Nedeljkovic  NBS and University of Warwick

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The euro zone sovereign debt exchange traded funds (ETFs) rapidly developed over the last decade.

The current (past?) crisis has induced changes in financial markets organization and interconnections.

Limited research on the funds’ performance in the literature.
1. Examine the tracking performance of 31 eurozone sovereign debt exchange traded funds (ETFs) over the 2007-2010 period.

- Use different measures:

  - $TE_1 = r_{etf} - r_{ind}$
  - $TE_2 = \left( \sigma_{etf}^2 + \sigma_{ind}^2 - 2\sigma_{etf}\sigma_{ind}\rho \right)^{1/2}$
  - $TE_3 = \left( \hat{e}'\hat{e} / (n - 2) \right)^{1/2}$ where $\hat{e} = r_{etf} - \hat{\alpha} - \hat{\beta}r_{ind}$
  - $TE_4 = \log \text{NAV}_{t,etf} - \hat{\beta} \log \text{NAV}_{t,ind}$
Tracking performance results

- All ETF’s underperform using all the above measures.

- Distinct behavior between ETFs which use physical replication strategy relative to swap based funds. The former perform better using $TE_2$ and $TE_3$, while the opposite is found with $TE_1$ and $TE_4$. $TE_4$ suggests the existence of the long run cointegrating relationship.

- There is an evidence of structural breaks in the relationship between the returns using OLS regression that underlies $TE_3$.
Explaining the tracking error

Contributions -

2. Panel analysis of the tracking error determinants

- $TE_{2,i,t} = \alpha_i + \beta' X_{i,t} + u_{i,t}$
- Tracking error is positively related to: (i) underlying index volatility; (ii) changes in credit (CDS) spreads; (iii) duration of the portfolio of sovereign bonds in the target index and (iv) weakly to liquidity of the ETF.
- Conversely, larger asset under management and management fees reduce the tracking error.
- The replication method has effect on the tracking performance.
- The dummy variable for structural break around the Lehman brothers collapse signals the presence of breaks.
1. Taking a stance on the most relevant measure

- Validity of one measure implies problems for inference with other.
- Detected structural breaks $\implies$ sample correlation coefficient may increase spuriously.
- Detected structural breaks $\implies$ the critical values of Johansen’s test may not be valid.
- Observed cointegration $\implies$ omitted variable bias and endogeneity bias may have effect on the OLS estimates.
2. Alternative measure of performance

- Instead of using the probability of rejecting the null hypothesis that the tracking error is non-stationary, can we evaluate the ETFs and methods out-of-sample?

- Useful for investors who base their decisions on observed and expected performance of the ETFs.

- Use VECM to forecast $\Delta \widetilde{NAV}_{t+1, \text{etf}}$ and $\Delta \widetilde{NAV}_{t+1, \text{ind}}$, compute the forecasted tracking error and compare it to the observed error, patterns?
3. Time variation in panels

- Using a simple dummy variable may not capture the break if the break date is heterogeneous over the panel units.

- There may be more than one break point.

- An alternative: allow for time-varying coefficients.

\[ TE_{2,i,t} = \alpha_{i,t} + \beta'_t X_{i,t} + u_{i,t} \]