Comments to:
A. García-Hiernaux, M.T. Gonzaléz-Peréz & D.E. Guerrero
Eurozone prices: A tale of convergence and divergence

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The paper in (very) few words

- The paper presents:

  - A test to determine price convergence in means (PCM) and variance (PCV) based on five proposed definitions.

  - A methodology to estimate the speed of price convergence in a common area.

- Empirical results:

  - Generally, the EMU countries' price levels do not converge in the long run.

- Interesting assessment of interest to monetary policy makers in, particularly, the euro zone.

Discussion (5 minutes)

1. The five definitions, which are the foundation of the analysis.

2. Some data issues.

3. Final comments.

Definition 1

➤ As the base assumption, the inflation rate can be decomposed into a (stochastic) trend and plus an inflation gab: $\pi_t = \pi_t^* + \varepsilon_t$.

    ➤ Decomposition employed by several authors, recently by Stock & Watson (Restat, 2016) in their discussion of core and trend inflation.

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- **Definition 1:** Permanent inflation component is the ***expected*** variation of the price level in the long run: $\pi_t^* = \lim_{k \to \infty} E_t[\pi_{t+k}]$.

- In line with other definitions of trend inflation in the literature.

- In its general form, the limit may change over time, but, as the authors note, if inflation is under control it is constant, $\pi_t^* = \pi^*$.

  - Analogously, if an inflation targeting central bank is credible.

Definition 2

- Similarly to the inflation decomposition, the relative price level is decomposed into (stochastic) a relative price trend and a price gab: $\tau_{ij,t} = \tau^*_{ij,t} + \gamma_{ij,t}$.

- **Definition 2:** Permanent relative price component: $\tau^*_{ij,t} = \lim_{k \to \infty} E_t[r_{ij,t+k}]$, where $r_{ij,t} = \ln P_{it} - \ln P_{jt}$.

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➤ This definition may seem a bit strange as it is based on the expectation. Often one expect that the permanent part of the inflation has to do with the underlying or core inflation (?)

Definition 3

➤ **Definition 3:** Asymptotic Price Level Convergence in Mean (PCM). The price levels in countries i and j <u>converge</u> asymptotically in mean if $\lim_{k \to \infty} E_t[r_{ij,t+k}] = \tau^*_{ij}$ holds for all t with probability 1.

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➢ It is not clear to me why the levels **do converge** if the **expectation** for some future level is constant

➢ If prices converge asymptotically then $\lim_{k \to \infty} r_{ij,t+k} = \tau_{ij}^*$ (?)

➢ If prices are expected to converge sometime, say during the next 100 year, then the $k \to \infty$ expectation will always hold.

➢ In a strict sense, with this definition you will always have convergence in a currency union (?)

Definition 4

➢ **Definition 4:** If $r_{ij,t} = \ln P_{it} - \ln P_{jt}$ is a stationary process with finite mean and variance and $\lim\limits_{k \to \infty} E_t[r_{ij,t+k}] = \tau_{ij}^*$, then

1. P_i and P_j converge in an absolute sense if $\tau_{ij}^* = 0$,

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➤ Definition relates to absolute and relative PPP.

➤ If absolute PPP holds, then $P_{it} = P_{jt}$

➤ If relative PPP holds then $\Delta P_{it} = \Delta P_{jt}$

    ➤ How should we think about the expectation part?

Definition 5

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  $$\lim_{k \to \infty} E_t \left[\left(r_{ij,t+k} - \tau_{ij}^* \right)^2 \right] = v_{ij} \text{ holds for all } t \text{ with probability 1.}$$

- Absolute (relative) convergence in distribution if $v_{ij} = 0 \ (\neq 0)$

  - As noted by the authors, this holds only if we assume normality. Is this a realistic assumption?

- To sum up, a concern with respect to the definitions may be that they relate the process of convergence with expectation without saying anything about how these expectations are formed. (?)

A data issues

- The authors employ the HICP in the analysis. A couple of points in this respect:

  - HICP is harmonized across countries

    - BUT weights in the consumer baskets are country dependent, so they reflect "the cost of living" in each countries.

  - The indices have the same base year

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        - BUT the countries do not have the same price levels in the base year.

- Figures 2 and 3 show the price and relative price level. These figures are important as they show how prices have converged in the countries considered in the analysis. It is, however, not clear how they are calculated. A footnote refers to a detailed statistical data appendix, which is available on request.

    - I think this appendix should be included in the paper.

Final comments

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- The framework presented can be applied to tests convergence of prices.

  - It would be interesting to see results for a long-time established currency area such as the for states or regions of the US.

- Application to the EMU countries show that they generally have not converged after the introduction of the euro.

  - Would it be possible within this framework to estimate when convergence should happen in absence of mayor idiosyncratic shocks?