The cointegration of Baltic states with main trading partners

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MOTIVATION

Since a Monetary union requires a "one-size-fits all" monetary policy there is quite strong opinion, that member countries should exhibit **similar business cycles.**

Lack of cohesion between members of EU and EMU might impede unified economic policies.

The regional and sub-regional linkages can help augment – or, on the contrary, destabilize – the European Union as a whole (Hegerty, 2017).

Many researches still argue that the business cycle synchronization in Europe is not high enough for a successful currency union.

MOTIVATION

The theoretical relationship between trade integration and business cycle synchronization also remains equivocal.

The positive relationship between international trade patterns and international business cycle is described in Commission of the European Communities (1990) in An evaluation of the potential benefits and costs of forming an economic and monetary union.

We follow Frankel and Rose (1998) argument that OCA requirements according to **Mundell (1961) and Kenen (1969)** can be fulfilled *ex-post,*

i.e. assuming that after the introduction of the Eurozone the trade among member countries should increase, which increases business cycle synchronization.

THE KEY QUESTION IS

- Did the **introduction of the Eurozone increase intensity of trade** among member countries and

- did the **intensity of trade** increase the **synchronization of business cycles** with trade partners.

GOAL

The paper seeks to investigate the cointegration of business cycles of Baltic region (Estonia, Latvia, Lithuania) with the main trading partners.

HYPHOTHESIS

We expect, that more intensive international trade results in increasing the international coherence of business cycles with business partners

And vice versa- closer comovements of business cycles with business partners results in more intensive international trade.

VALUE

We believe, that the **strength** of main macroeconomic variables **comovements** might help

- to **better forecast** the trends and

- **apply** more appropriate **decisions** on macroeconomic policies.

RESEARCH PLAN AND MODEL

1. Investigation of business cycle and trade co-movement in three Baltic states separately → combining them in to one region.

2. Determination of the main trading partners of Baltic region.

3. Analysis of business cycle co-movements of Baltic region with the main trading partners.

4. Investigation of the links between the business cycle synchronization (business cycle co-movements expressed in GDP, C and I) and   trade intensity

5. Examination of the direction of the impact: wether trade intensity impacts business cycle (the country's output, C and I) or vice versa, or reciprocal impact.

6. Examination wether and how trade intensity impacts the country's output, C and I.

Data

Quarterly GDP data from 1999 Q1 to 2019 Q2, n=82

We split it into 2 periods:

- before entering EU, 1999 Q1-2004 Q2; n=22

- after entering EU, 2004 Q3 - 2019 Q2, n=60

- In all stages of research we compare wether the trade intensity and **business cycle synchronization between Baltic region and its main trading partners differ significantly** before entering and after joining EU.

Trade intensity

We use two different proxies for bilateral trade intensity (*Frankel and Rose,* 1998) :

1. Trade intensity normalized by total export and import of trading companies;

$$wt_{ijt} = (X_{ijt} + M_{ijt})/(X_{i.t} + X_{j.t} + M_{i.t} + M_{j.t})$$

2. Trade intensity normalized by GDP of trading countries

$$wy_{ijt} = (X_{ijt} + M_{ijt})/(Y_{i.t} + Y_{j.t})$$

GDP, C and I

Business cycles are modeled for **output, consumption and investment.**

GDP decomposition is done by **HP filter** and by **Baxter and King** (1999) bandpass filter.

- **HP filter**

$$\min_{\tau_t} \sum_{t=1}^{T} \left[(x_t - \tau_t)^2 + \lambda((\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1}))^2 \right]$$
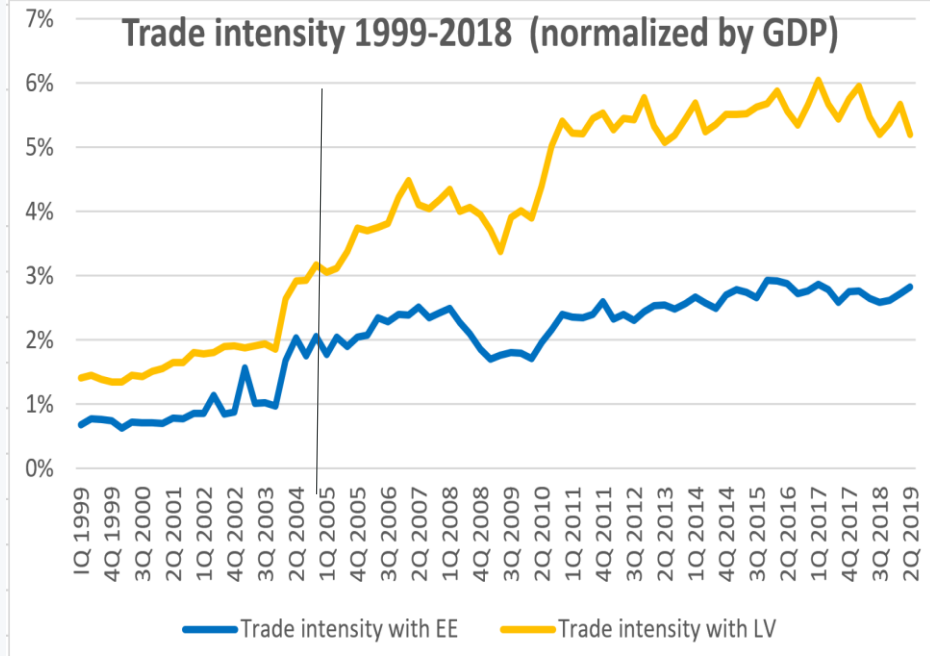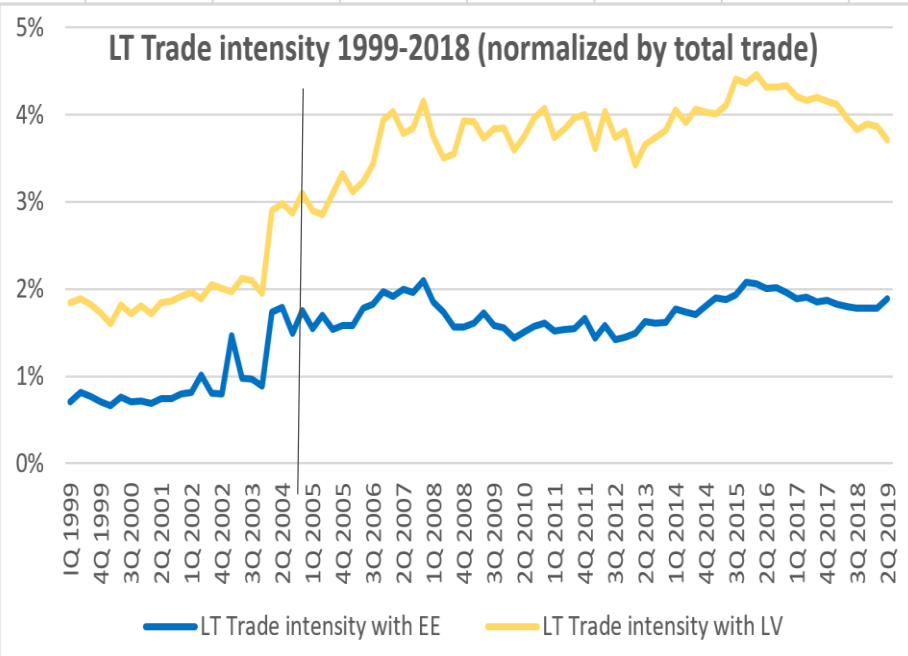
  - $\lambda = 1600$
  - the business cycle component = $x_t - \tau_t$

- Baxter and King (1999) **Simple moving average (SMA) filters with coefficients that sum to zero get as close as possible to keeping only the specified cyclical component.**
  - We use 2q + 1 terms that are as close as possible to those of the ideal filter.
 - minperiod=6 and maxperiod=32 and smaorder =12

1A. Investigation of trade intensity between three Baltic states

LT Trade intensity 1999-2018 (normalized by total trade)

LT Trade intensity with EE — LT Trade intensity with LV

Trade intensity 1999-2018 (normalized by GDP)
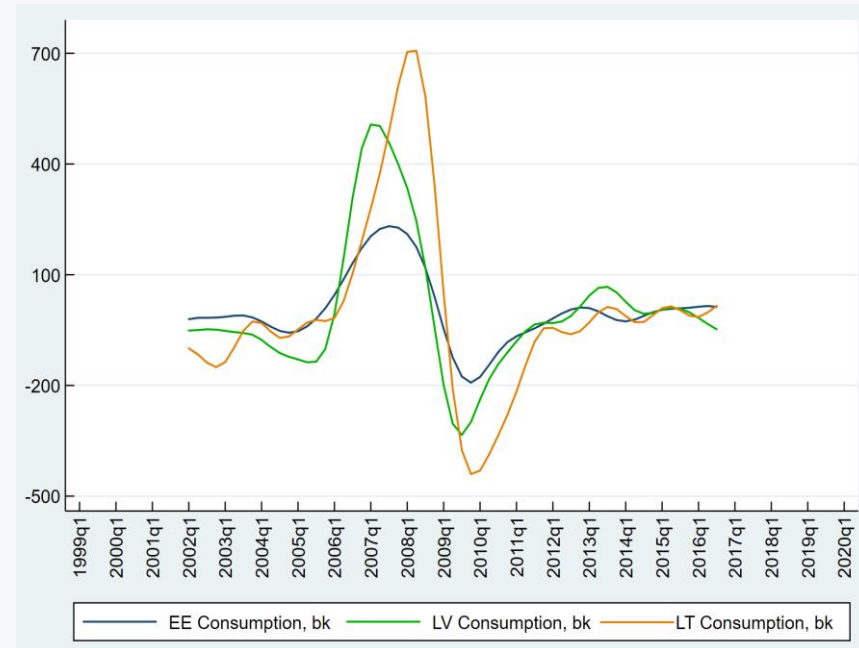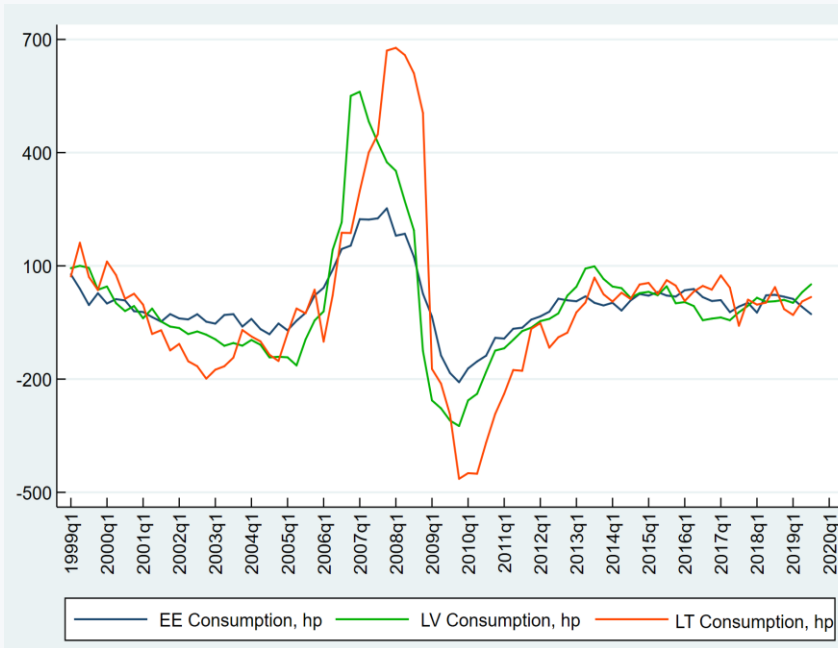
Trade intensity with EE — Trade intensity with LV

$$wt_{ijt} = (X_{ijt} + M_{ijt})/(X_{i.t} + X_{j.t} + M_{i.t} + M_{j.t})$$

$$wy_{ijt} = (X_{ijt} + M_{ijt})/(Y_{i.t} + Y_{j.t})$$

1B. Investigation of BC co-movement in three Baltic states. <u>GDP</u>, C and I (HP, BK)
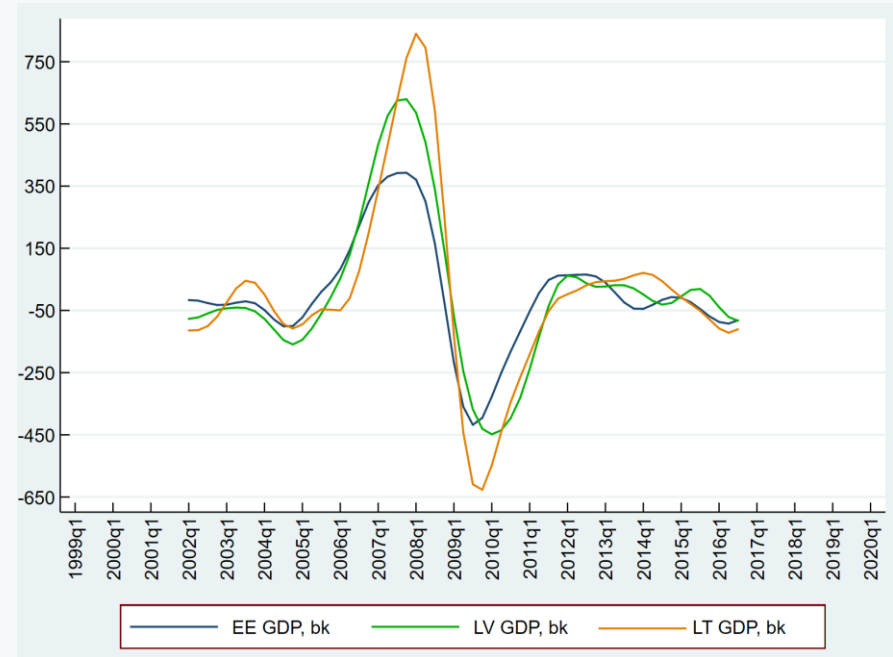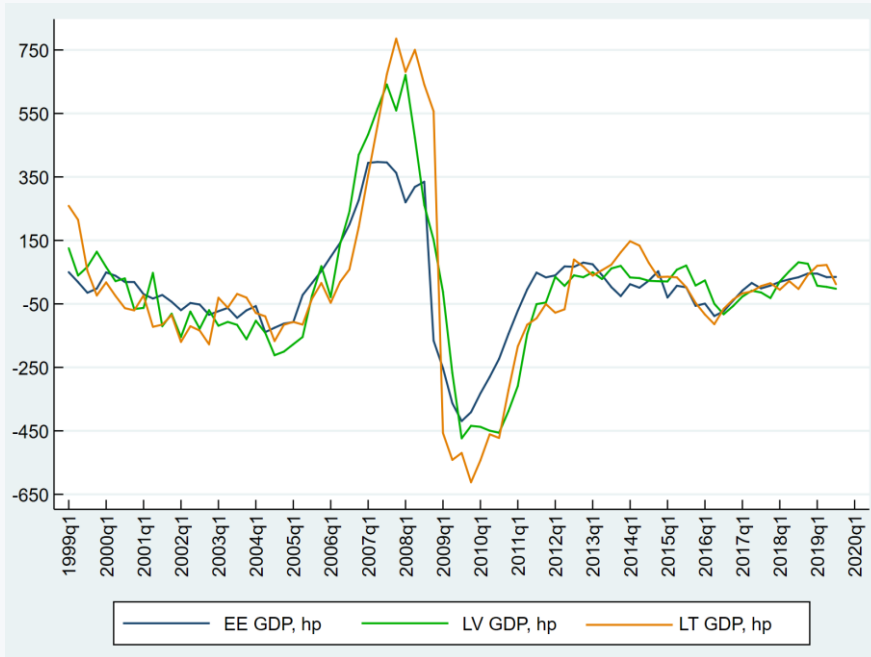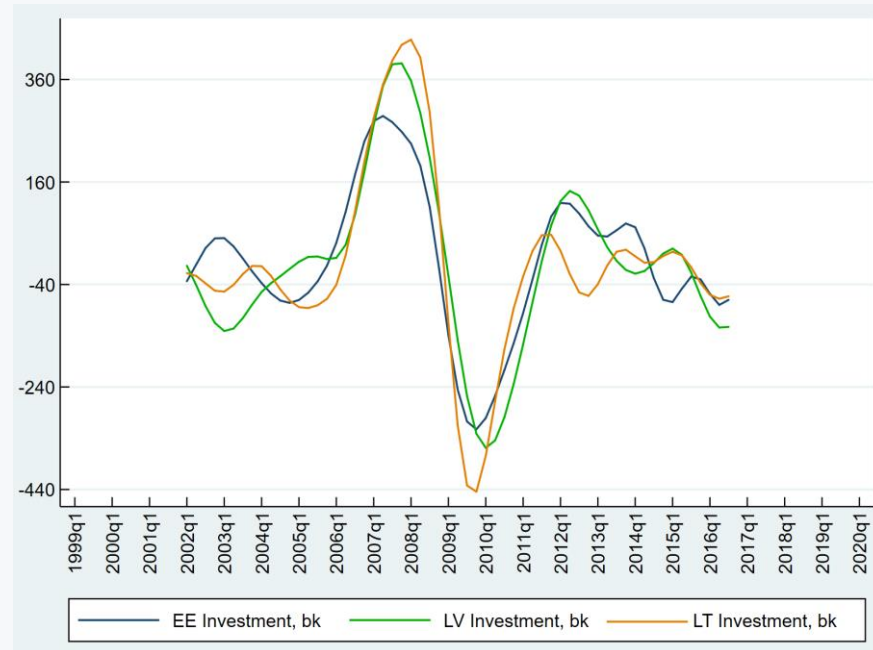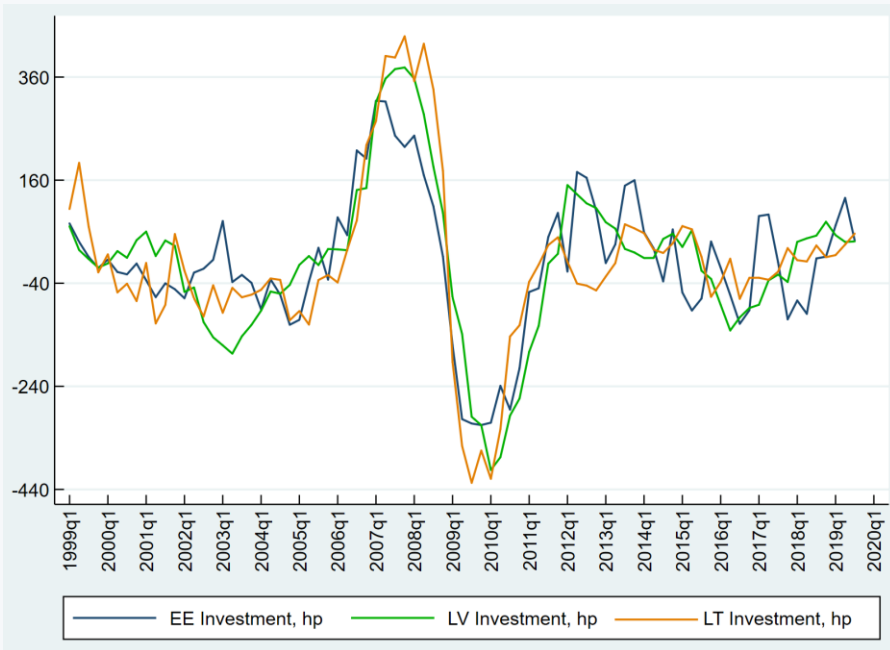
1B. Investigation of BC co-movement in three Baltic states. GDP, <u>C</u> and I (HP, BK)

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1C. Combining Baltic states in to one region.

Theorethical arguments that the Baltic States (Estonia, Latvia & Lithuania) could be treated as one region.

➢ „The Baltic countries represent a single economic area and share common shocks" (S. Kapounek & Z. Kučerova, 2019).

➢ Baltic countries form a very distinct business cycle cluster (M. Ahlborn , M. Wortmann, 2017).

➢ Lithuania, Latvia & Estonia were included in the same total economy productivity convergence cluster by Mihai Niţoi & Maria Miruna Pochea (2016).

➢ Di Gorgio identified similar responses of the Baltic nations to negative and positive shocks (2016).

➢ The Baltic States are similar in their historical path, political & social institutions. Geographical proximity & similar resources.

2. Selection of MAIN TRAIDING PARTNERS OF THE BALTIC REGION.

According to (/EX/+/IM/) select 20 most important trade partners for every Baltic state (they constitute ≈ 90% of total trade)

Calculate total trade of Baltic region with every trade partner
$TT_i=(/EX/+/IM/)LT+ (/EX/+/IM/)LV +(/EX/+/IM/)EE$

Calculate Baltic state trade intensity for every trade partner in 2 ways

Select 5-10 main trade partners

Test, whether trade intensity has changed significantly before and after the 2004

3. Analysis of Baltic region business cycle co-movements with the main trading partners.

- Graphical +correlation analysis of **business cycle co-movements using detrended** GDP, C, and I .

- Only cases with significant correlation are left.

- Test, whether business cycle co-movements has changed significantly before and after the entering in EU (2004 Q2).

4. INVESTIGATION OF THE LINKS BETWEEN THE BUSINESS CYCLE SYNCHRONIZATION AND TRADE INTENSITY

Investigation of the links between the business cycle synchronization (business cycle co-movements expressed in GDP, C and I) and trade intensity by calculationg the Pearson correlation coefficient.

5. EXAMINATION OF THE DIRECTION OF THE IMPACT

Granger causality is employed to define the **DIRECTION OF THE IMPACT :** whether trade intensity impacts the country's output, C and I, or vice versa, or reciprocal.

6. EXAMINATION WETHER AND HOW TRADE INTENSITY IMPACTS THE COUNTRY'S OUTPUT, C AND I.

Regression and VAR is applied to examine wether and how trade intensity impacts the country's GDP, C and I or vice versa.

QUESTIONS & SUGGESTIONS?

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