Revisiting the 'Kaldor-paradox': the real exchange rate, export performance and economic growth in the European Union

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Introduction

- The presentation is a tribute to Nicolas Káldor
- I combine his thoughts with those of Béla Balassa (another Hungarian-born great economist)
- I shall demonstrate the contemporary relevance of their thoughts by discussing two interrelated issues
  - RER-changes and export-market performance
  - RER-levels (misalignments) and economic growth

Points of departure (I)

Ambition: to combine the insights of two outstanding Hungarian (-born) economists on *real exchange rates* (RERs), RER-*misalignments*, export- and GDP-growth

Nicolas Kaldor (1908-1986)

Béla Balassa (1928-1991)

Points of departure (II)

- Both of the two economist reached their word-wide acclaimed results abroad (a pity, but understandable at their time)
- In current economic thinking: economists tend to forget the names of those, who made major advances in their specific field
- Káldor and Balassa are exceptions
  - The **Kaldor** paradox
  - The **Balassa**-Samuelson „effect" (more appropriately: the „Penn-effect" and the „BS-model")

Points of departure (III)

- The Kaldor-paradox (**KP**) [origin: Kaldor (1978)]
  - No precise definition, but the KP is considered to exist if a ***positive*** („*perverse*") correlation is observed between changes in RERs (alternatively defined) and changes in export market shares („export performance")
  - Background: Kaldor demonstrated cases involving
    - RER-appreciations accompanied by increasing export market shares (e.g., Germany, Japan)
    - RER-depreciations accompanied by falling market shares (e.g., UK, US)
- The KP *apparently* is in conflict with Kaldor's (1971) policy recommendation: maintain a competitive RER-***level*** (to promote export-led growth – one of Balassa's major themes)

Outline and main points

- **The KP: general observations and empirical evidence**

   [Kaldors' (1978) statistical demonstration is not convincing; beside changes, **levels** also matter; contrasting Kaldor (1971) with (1978), empirical evidence, EU27]

- **An approach to interpreting the level of RER-s and measuring the extent of RER-misalignment**

   (Based on the „BS-" (or „Penn"-) "effect" – Balassa's reappraisal of the PPP-theory)

- **RER-misalignments, RER-changes and economic growth in the EU: empirical results for the period 1995-2015** (comparison with 1999-2013)

   [Undervaluation „promotes", overvaluation „hinders" economic growth → supports Kaldor (1971); changes -> mixed results (depends on the sign of misalignment)]

- **Concluding remarks and important caveats**

   [In spite of Kaldor's view (1979), there is no fundamental conflict between Kaldor 1971 and 1978.

   The RER is not a policy instrument; avoiding overvaluation is essential, but a growth-friendly institutional environment is more promising for promoting economic growth than trying to manipulate the RER]

I. Observations on, and questions motivated by, the KP

- No trace of who „invented" (first used) the term KP, but has become a general reference (215 exact matches at google scholar)
- The concept is often „rediscovered" – an example by Bloomberg. Headlines:
    - „Goldman says trade volumes less sensitive to exchange rates"
    - „Japan, U.K. show limits of weaker currency on boosting growth"
- Two testable interpretations and an implication of the KP
- Was the case for the KP really convincing in Kaldor (1978)?
- In what sense is the KP relevant for the EU-countries between 1995-2015?
- Can comparative **changes** in RERs be interpreted without reference to comparative **levels**? (Convergence or divergence?)
    - Assuming **absolute** convergence of RERs to PPPs (the PPP-theory)[*]
- Can the **real effect of changes** in RERs be interpreted without *some* sense of the (income-dependent) **trend** of RERs?
    - Assuming **conditional** convergence to PPP (→ Balassa's amendment to the PPP-theory: controlling for differences in relative income levels)

[*] In this context we use the term „absolute convergence" in Cassel's original interpretation: exchange rates converge to PPPs (=RER-levels converge to 1). This is expected to apply for countries at similar levels of development.

I/1.a. Alternative interpretations of the KP

- Two different interpretations/implications of the KP:
  1. (Narrow:) Changes in RERs (depreciations/appreciations) „do not work" (and/or display a „**perverse**" relationship with export performance)

     ↔ *the claim is not supported by the data* on EU27, 1995-2015 [on exports of goods **and services**]
  2. (Broad:) Other factors (beside RER-changes) are also (or, even more) important in explaining changes in export market shares → *amply supported by the data*

I/1.b. The implication of the KP for (medium-term) growth

- The KP is **seemingly** in sharp contrast with Kaldor's (1971) recommendation: maintain a competitive RER-**level** (to promote export-led growth)

- However, Kaldor (1971) and (1978) can be reconciled by considering
  - RER-levels, and not just changes

- Two closely related publications, referring to Kaldor (both in CJE):
  - On (levels of) competitiveness and the KP: Boggio – Barbieri (2016)
  - On RER-misalignment and growth: Galla (2007) [58 developing countries]

I/2.a. Kaldor's (1978) demonstration of the KP

Table 2

LONG-RUN RELATIONSHIP OF CHANGES IN COMPETIVENESS AND CHANGES IN TRADE PERFORMANCE IN MANUFACTURES 1963–1975

Percentage Changes in

Country	Relative Labour Costs per unit of output	Relative Export Prices	Export Shares
United Kingdom	−21·4	−12·4	−37·9
United States	−43·7	−14·1	−17·8
France	− 8·6	+ 4·9	+17·8
West Germany	+42·9	+10·1	+ 3·0
Italy	+24·1	− 9·3	+18·3
Netherlands	−10·5	− 0·5	+19·0
Belgium–Luxemburg	+ 7·2	− 1·8	+ 1·7
Sweden	−10·4	+22·0	+ 8·8
Switzerland	+33·3	+31·7	−11·8
Canada	−22·3	−13·3	+ 2·3
Japan	+27·1	+ 4·5	+72·0

Note: Export prices are obtained by taking official estimates of changes in export unit values of manufactured goods of each country translated into U.S. dollars at current rates of exchange. Equally labour costs per unit of output and export shares are expressed in terms of U.S. dollars. The figures indicate in each column the proportionate percentage changes in the relevant item between the beginning and the end of the period.

Source: As in Table 1.

3 observations:
- Of the 12 cases, 4 cases support the KP clearly
- Exports shares are influenced by export prices (endogeneity)
- No attempt to control for levels (convergence or divergence in RERs?)
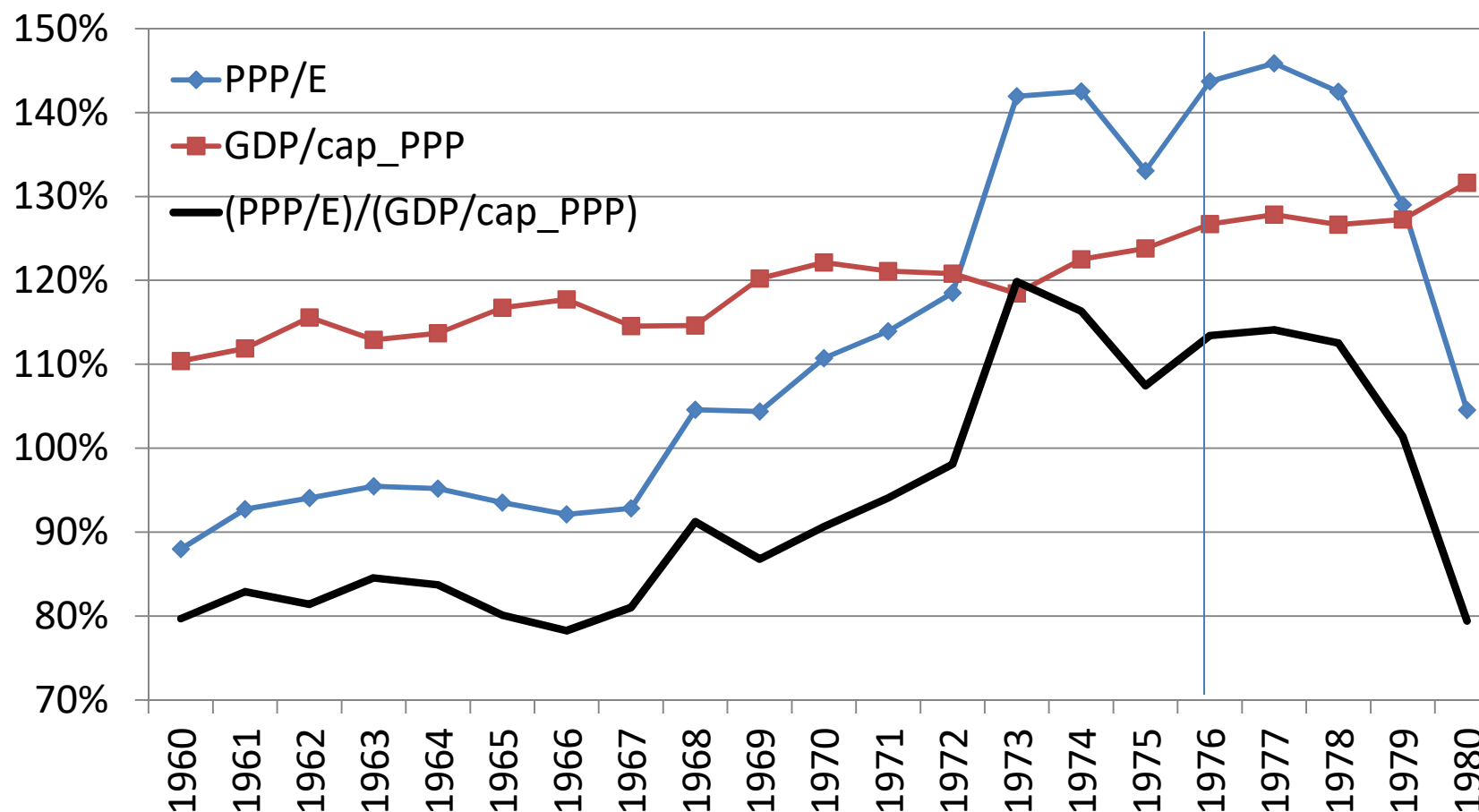
An amendment:
The UK-s export-share (in real terms) may have fallen more without the real depreciation of the Ł

I/2.b. Germany/UK: the relative GDP-price level (PPP/E), relative GDP/cap and the ratio of the two (UK=100%)
[A comparison implied by Balassa (1964)]

The Ł is likely to have been significantly overvalued relative to the DM in 1960.
The real depreciation involved a correction of the undervaluation

Source: AMECO, own calculations

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I/3.a. Statistical evidence: EU27, 1995-2015, annual observations

The partial effect of dlog(RER_ULC_manuf) on the %-change in the market share of exports of goods and services, controlling for „initial" (1995) income: EU27, 1995-2015

		Numer of obs.	% of total	Coefficient of d(RER)
	Total	540	100%	-0.184***
	"Conventional"	311	58%	
	KP	229	42%	
1.1	Increase in msh.	296	55%	-0.078***
1.2	Decrease in msh.	244	45%	-0.135***
2.1	Depreciation	259	48%	-0.160***
2.2	Appreciation	281	52%	-0.263***
2.1+1.1	Depr.+increase	163	30%	-0.134***
2.2+1.2	Apr.+decrease	148	27%	-0.242***
2.2.+1.1 (KP)	Apr.+increase	133	25%	not significant
2.1.+1.2 (KP)	Depr.+decrease	96	18%	not significant

***: significant at the 1% level.

1 . In the „conventional" cases the coefficient of dlog(RER_ULC_manuf) (which has the highest R^2 among the 5 alternative RER-indices) is statistically significant, with the expected sign.

In the „KP" cases the coefficient of d(RER) is not significantly different from zero. **NO** „negative correlation".

2. In our sample, on average, 1% RER-**appreciation** was almost twice as „effective" in **decreasing** market shares (-0,24), as 1% RER-**depreciation** in **increasing** market shares (-0.13).

I/3. b. The „Competitiveness matrix"*/
%-share of observations corresponding to alternative combinations of changes in RERs (manuf. ULC) and market shares (in OECD-imports) of 27 EU countries, 1995-2015
## (No. of observations: 540)

Change in RER ⇓	Change in market share		
	Lack of competiveness (Decreasing market share)	Competitiveness (Increasing market share)	
RER-appreciation	**Price/cost non-competitive exports (Conventional)** **(27%)**	**Qualitatively competitive exports (KP)** **(25%)**	52%
RER-depreciation	**Qualitatively non-competitive exports (KP)** **(18%)**	**Price/cost competitive exports (Conventional)** **(30%)**	48%
43% (KP)	45%	55%	57% (C)

- In a broader sense the KP certainly **exists** (in 43% of 540 observations)
- Observations supporting the KP mainly correspond to *improvements* in *qualitative* competitiveness.
- To get more robust results, the No. of observations need to be weighted by the size of the changes in RERs/market shares
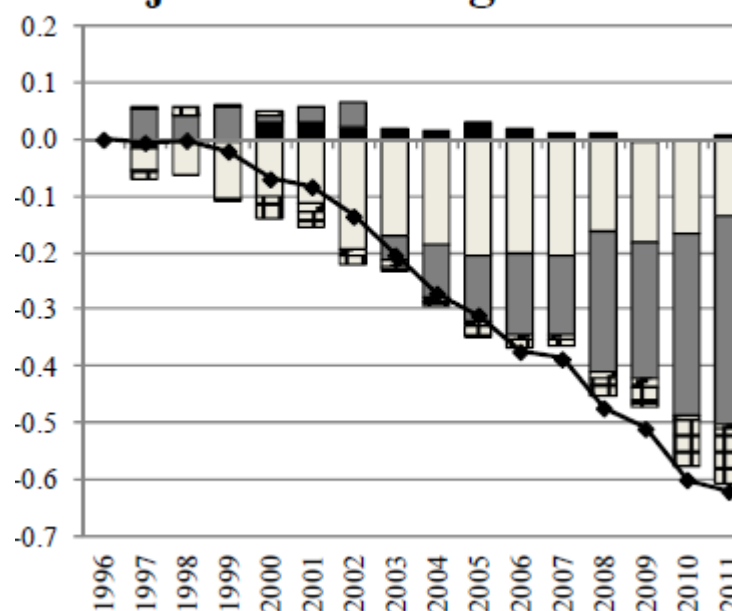
*/ Based on the modification of Aiginger's (1997) scheme

I.3.c. An example for a „constructive" application of the KP: decomposition of changes in export market shares (1996-2011)


e. Germany
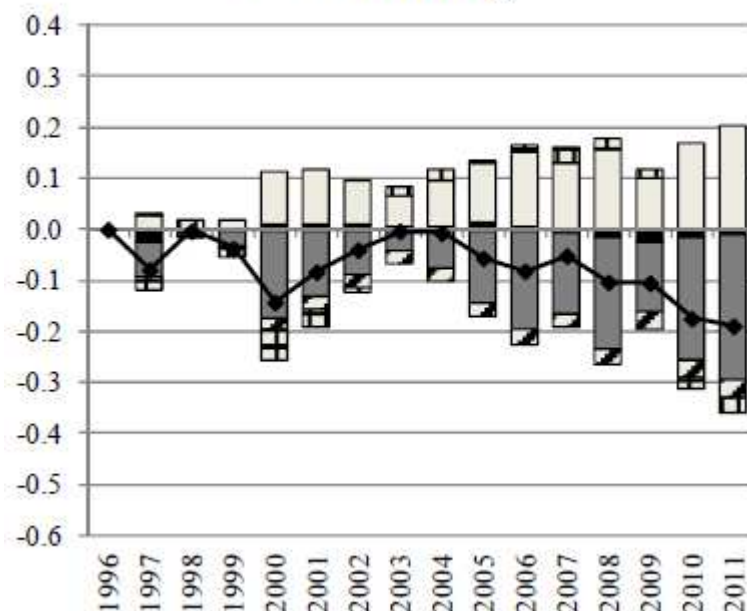
j. United Kingdom

Legend:
- ■ Extensive margin
- ☐ Price competitiveness
- ▨ Non-price competitiveness
- ▨ Set of competitors
- ▥ Demand structure
- ◆ Market Share

Both UK's and Germany's non-price competitiveness deteriorated in world markets, but Germany's price competitiveness improved, while the UK's deteriorated: quite different from what Kaldor found for the period 1960-76
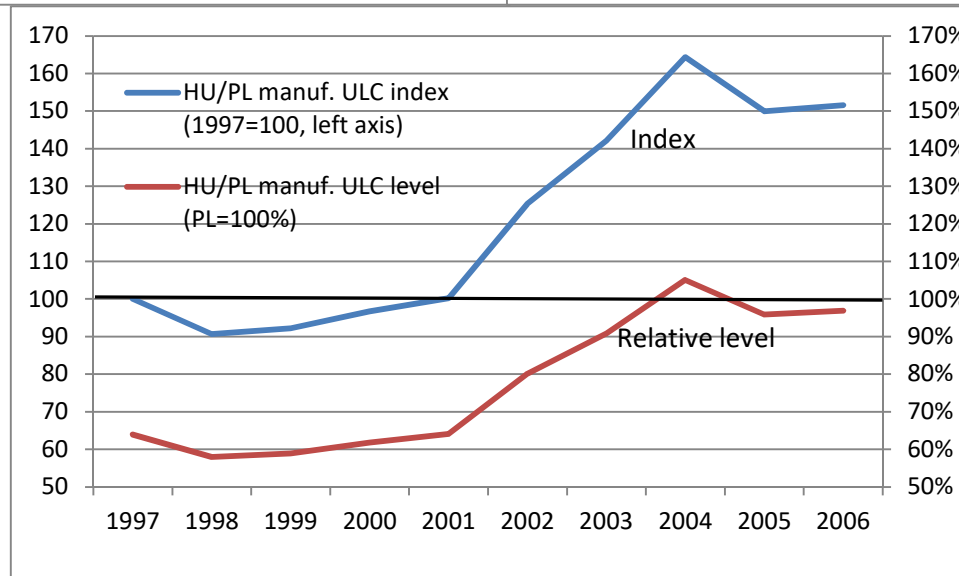
I/4. The importance of levels vs. changes: an example */ (Pitfalls in comparing index-numbers)

V4: Manufacturing ULC indices (1997=100, lhs.) and levels (rhs.)relative to Germany (1997-2006)
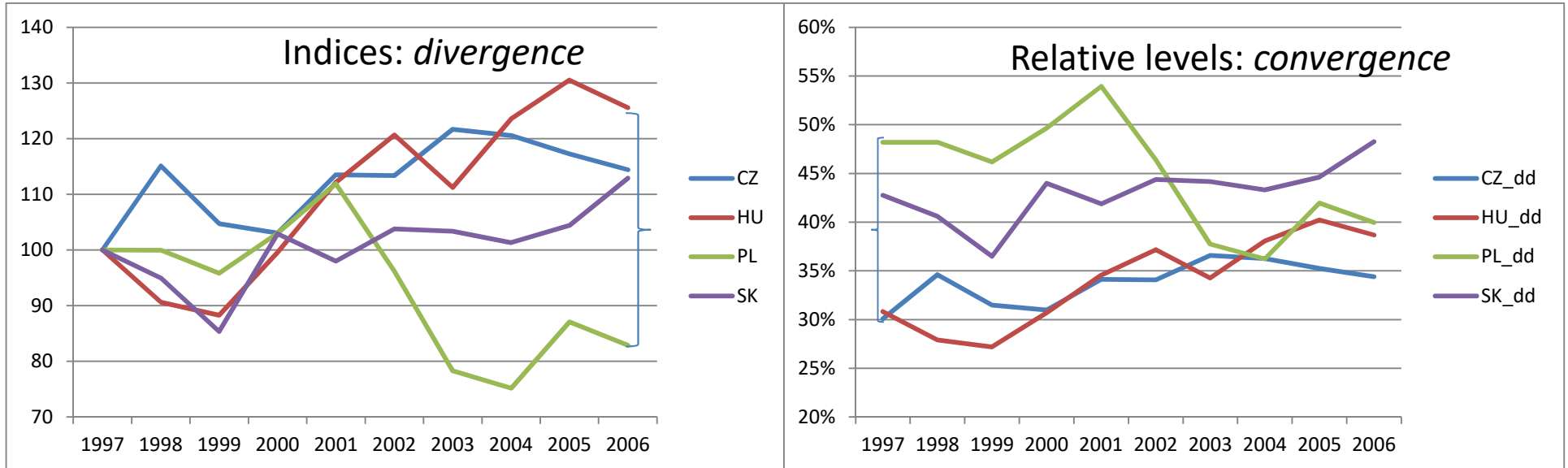
Indices: between 2001-2004 a huge increase in HU's ULC relative to PL.
**Levels**: by 2004 HU's and PL's ULC reached the same level.

ULC: HU/PL Index (left axis) and relative level (right axis)

*/Source: Békés-Muraközy-Munkácsi-Oblath (2014)

II. Balassa's reappraisal of the PPP-theory and implications for measuring RER-misalignments

- Close correlation between relative *real* per capita GDP **levels** (VC_{GDP}) and relative GDP price **levels** [($PLI_{GDP} = PPP_{GDP} / ER$) = RER_ $P_{GDPlevel}$]
  – Their joint **long-term dynamics**: also close correspondence $\rightarrow$
- Samuelson (1994) coined the *observed regularity* as the „Penn-**effect**";

  [a possible (controversial) *explanation*: the „BS-**model**"]
- A *possible* approach to interpreting RER misalignments: *deviation of actual PLI_{GDP} from the estimated relationship between PLI_{GDP} and VC_{GDP}*
  - several alternative approaches to interpreting/estimating RER-misalignments are based on the notion/concept of „equilibrium RER" (-> „ERER")
  - our approach – in the spirit of Kaldor – does not rely on the concept of „ERER"
- How do misalignments (and their changes) affect economic growth?
- Important contributions to the relationship between PLI-misalignments and growth:
  – Bhalla (2012), Galla (2007), Podkaminer (2010), Rodrik (2008) $\rightarrow$

II/a. The static and the dynamic Penn-effect: EU27 (EU28=100)
(Upper charts : levels in 1995 and 2015; lower chart %-change, 1995-2015)
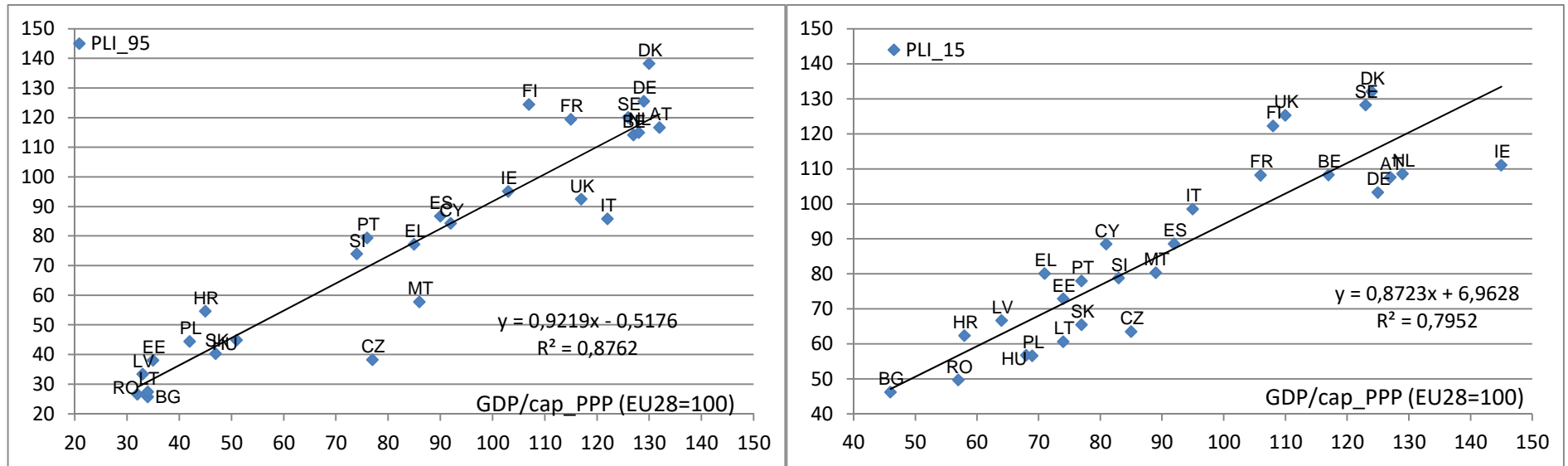
$\Delta\%\ PLI_{GDP}$: „error correction" [relative change in GDP/cap + tendency for correction of deviations from the (time-variant) cross-section trend (CZ, MT)]
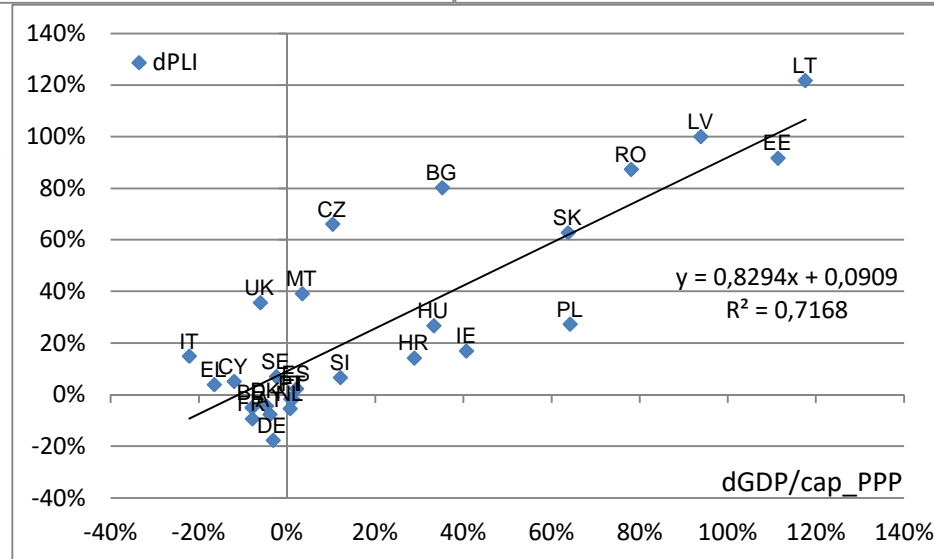
III. RER-misalignments, RER-changes and economic growth in the EU27: empirical results for the period 1995-2015 (1999-2013)

- How are deviations of PLIs from the trend (interpreted as RER-misalignments) related to (how do they „affect") per capita real economic growth (convergence)?

- We estimate PLI misalignment by the residuals of the following regressions:

$$\log(PLI_i) = \alpha_0 + \alpha_1 * \log(VCgdp_i) + u_i$$

$$\log(PLI_i) = \alpha_0 + \alpha_1 * \log(VHgdp_i) + u_i$$

u_i -> „misalignment" (MISAL); If u_i >0 $\rightarrow$ „overvaluation"; if u_i <0 $\rightarrow$ „undervaluation"
We mainly rely on the first equation

- Our growth regressions (the „effect" of MISAL on economic growth) include the conventional control variables (education, fiscal position, inflation, investment rate etc.)

III/1. The relationship between RER misalignments (their changes) and economic growth (EU27; 1995-2015)

Variables	1	2	3
GDP_{t-1}	-0.219***	-0.172***	-0.233***
	(0.043)	(0.039)	(0.040)
$MISAL_{GDP,t}$	**-0.079****		**-0.117****
	(0.037)		**(0.035)**
$\Delta MISAL_{GDP,t}$		**-0.127****	
		(0.030)	
$(MISAL_{GDP,t})^2$			**-0.003****
			(0.001)
No. of observations	479	479	479
R^2	0.697	0.704	0.722
No. of countries	27	27	27

Robust standard errors in parantheses
*** p<0.01, ** p<0.05, * p<0.1

Interpretation
- *Levels*: negative relationship between PLI misalignments and economic growth
  - „undervaluations" promote,
  - „overvaluations" hinder growth.
- *Changes*: negative relationship. A decrease in overvaluation, or an increase in undervaluation promotes growth (and vice versa).
- However, the effect of misalignment is *not linear*:
- The negative sign of MISAL[2] indicates that *the growth boosting effect of undervaluation is diminishing when a country gets further from the implied "neutral" level.*
- On the other hand, *the **negative** growth effect of overvaluation becomes stronger if the PLI of a country gets further from our estimated „neutral" level.*

III/2. Are the relationships symmetric? (Yes and no)
("Undervaluations" vs. "overvaluations" and their changes) – 1995-2015

Variables	1	2
GDP_{t-1}	-0.228***	-0.172***
	(0.039)	(0.037)
$MISAL_{GDP,t}$	-0.204***	
	(0.052)	
$UVAL*MISAL_{GDP,t}$	**0.206*** **	
	(0.062)	
$\Delta MISAL_{GDP,t}$		-0.202***
		(0.037)
$UVAL*\Delta MISAL_{GDP,t}$		**0.144*** **
		(0.050)
No. of observations	479	479
R^2	0.717	0.712
No. of countries	27	27

Robust standard errors in parantheses
*** p<0.01, ** p<0.05, * p<0.1

- There is no evidence for asymmetry in the case of **the level of misalignment**.
- However, in the cases of **changes in misalignments** :
- the partial effect of a **decrease** in PLI on growth is stronger, if the relative price level is above its implied „neutral" (≠ equilibrium) level
- than if it is below it.

This amends our former result: **growth is boosted more** by a
- proportionate *decrease in overvaluation*, than by a
- *proportionate increase in undervaluation*.

III/3. Are the results different for the CEEC10 than for the EU16? (No) – 1995-2015

VARIABLES	1	2
GDP_{t-1}	-0.233***	-0.175***
	(0.038)	(0.039)
$MISAL_{GDP}$	-0.143***	
	(0.040)	
$CEEC*MISAL_{GDP}$	0.100*	
	(0.056)	
$\Delta MISAL_{GDP}$		-0.087**
		(0.036)
$CEEC*\Delta MISAL_{GDP}$		-0.061
		(0.055)
Observations	479	479
R-squared	0.705	0.705
Number of cc	27	27

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

The coefficient of the interaction-term between the CEEC10 and the level of (change in) misalignment is not significant

Summary and conclusions (I)

- The KP – *broadly* interpreted – is an empirical fact: in a significant part of our observations market shares and RERs changed in the same direction
  - Non-price /cost competitiveness matters a lot – Kaldor was right
- The KP – *narrowly* interpreted – does not exist in the EU (1995-2015): there is no evidence of a systematic (and statistically significant) „perverse correlation" between changes in market shares and RERs [in KP cases: NO correlation]
  - Price (cost) competitiveness also matters
  - An important question suggested by Kaldor (1978): the direction of causation between RERs and market shares
    - Kaldor (2008) suggested: market shares ($\uparrow$) $\rightarrow$ RER ($\uparrow$) [and vice versa]
    - Our results suggest a two-way (Granger-) causality
- The major problem with the KP (and the related literature): RER-changes are mostly discussed without reference to *levels*

Summary and conclusions (II)

RER-misalignment and growth in the EU (an application of Balassa's reappraisal of the PPP-theory):

- RER misalignments affect economic growth
- Overvaluation hinders growth; the increase in overvaluation hurts growth even more
- Undervaluation assists growth, but the returns of increasing undervaluation are sharply diminishing
- Policy conclusion: sustaining a competitive real exchange rate *level* (*avoiding overvaluation*): favorable for growth →
- Matches the conclusion of Kaldor (1971)

Summary and conclusions (III)

Important caveats:

- We reviewed general statistical relationships regarding 27 EU-member states, but country-specific factors are important

  (However, there is no significant difference between the EU16 and the CEE10 group regarding the observed relationships)

- The nominal ER *is,* but *the RER is not a policy instrument*

- Establishing and maintaining a growth-friendly institutional environment is much more promising for promoting long-term growth than attempts to manipulate the RER

- My impression: the present policy-makers in Hungary think otherwise

Thank you for your attention!

Appendix

III/1. The relationship between RER misalignments (their changes) and economic growth (1999-2013)

Variables	1	2	3
GDP_{t-1}	-15.658***	-12.679***	-16.687***
	(3.271)	(3.015)	(3.183)
$MISAL_{GDP,t}$	**-0.117***		**-0.124***
	(0.040)		**(0.039)**
$\Delta MISAL_{GDP,t}$		**-0.137***	
		(0.029)	
$(MISAL_{GDP,t})^2$			**-0.003***
			(0.001)
No. of observations	320	320	320
R^2	0.761	0.751	0.773
No. of countries	26	26	26

Robust standard errors in parantheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Interpretation
- ***Levels***: negative relationship between PLI misalignments and economic growth
  - „undervaluations" promote,
  - „overvaluations" hinder growth.
- ***Changes***: negative relationship. A decrease in overvaluation, or an increase in undervaluation promotes growth (and vice versa).
- However, the effect of misalignment is ***not linear***:
- The negative sign of $MISAL^2$ indicates that *the growth boosting effect of undervaluation is diminishing when a country gets further from the implied "neutral" level*.
- On the other hand, *the **negative** growth effect of overvaluation becomes stronger if the PLI of a country gets further from our estimated „neutral" level.*

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III/2. Are the relationships symmetric? (Yes and no)
(„Undervaluations" vs. „overvaluations" and their changes) – 1999-2013

Variables	1	2
GDP_{t-1}	-16.65***	-12.64***
	(3.252)	(2.904)
$MISAL_{GDP,t}$	-0.183***	
	(0.0646)	
$UVAL*MISAL_{GDP,t}$	**0.131***	
	(0.0748)	
$\Delta MISAL_{GDP,t}$		-0.211***
		(0.0308)
$UVAL*\Delta MISAL_{GDP,t}$		**0.161***
		(0.0405)
No. of observations	320	320
R^2	0.768	0.759
No. of countries	26	26

Robust standard errors in parantheses
*** p<0.01, ** p<0.05, * p<0.1

- There is little evidence for asymmetry in the case of **the level of misalignment**.
- However, in the cases of **changes in misalignments**, the estimates are significant :
- the partial effect of a **decrease** in PLI on growth is much stronger, if the relative price level is above its implied „neutral" (≠ equilibrium) level
- than if it is below it.

This amends our former result: **growth is boosted more** by a
- proportionate *decrease in overvaluation*, than by a
- *proportionate increase in undervaluation*.

III/3. Are the results different for the CEEC10 than for the EU16? (No) – 1999-2013

VARIABLES	1	2	3	4
GDP_{t-1}	-6.453***	-15.69***	-3.722**	-12.71***
	(2.016)	(3.205)	(1.728)	(3.062)
$MISAL_{GDP}$	-0.158**	-0.130**		
	(0.0623)	(0.0593)		
$CEEC*MISAL_{GDP}$	0.0287	0.0260		
	(0.0800)	(0.0829)		
$\Delta MISAL_{GDP}$			-0.179***	-0.129***
			(0.0530)	(0.0331)
$CEEC*\Delta MISAL_{GDP}$			-0.0174	-0.0140
			(0.0709)	(0.0570)
Observations	358	320	358	320
R-squared	0.664	0.762	0.655	0.751
Number of cc	26	26	26	26

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

The coefficient of the interaction-term between the CEEC10 and the level of (change in) misalignment is not significant

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