

Models of Equilibrium Exchange Rates used at the CNB

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Presentation Outline

- 1. Motivation
- 2. Models of Equilibrium Real Exchange Rates (ERER)
- 3. Models used by the Czech National Bank (BEER, FEER, SRER)
- 4. Model outcomes
- 5. Conclusions and future steps

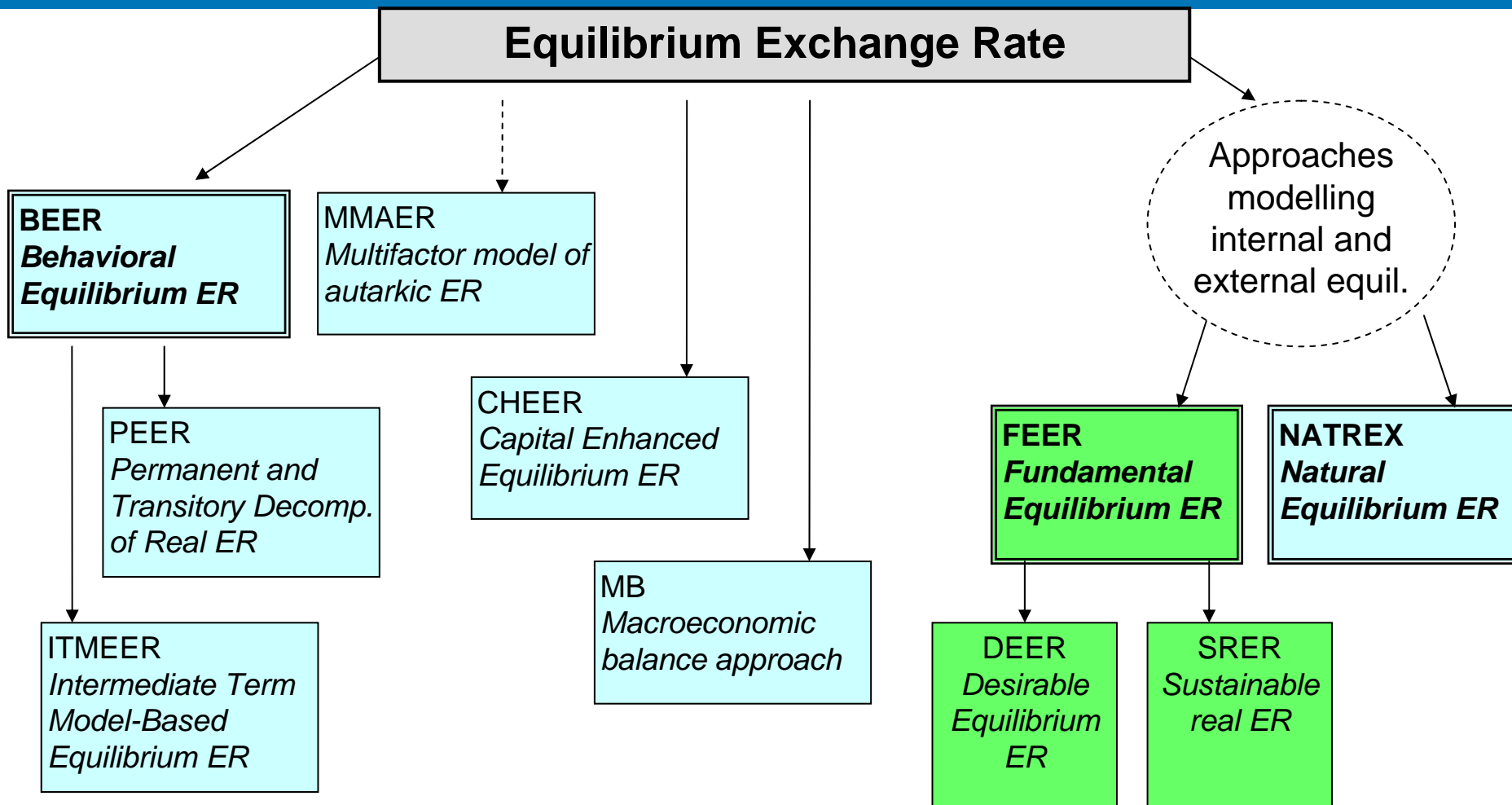
1. Motivation

- To prepare models of EREER for policymakers
- Based on estimated EREER, discuss:
 - Setting the level of equilibrium appreciation in core macroeconomic model of the CNB;
 - Possible identification of misalignment (or a bubble) of the exchange rate;
 - Competitiveness of the Czech Republic;
 - Risks of the euro adoption.
- To build up econometric tools for estimating the EREER (requirements from EC, ECB, etc.).

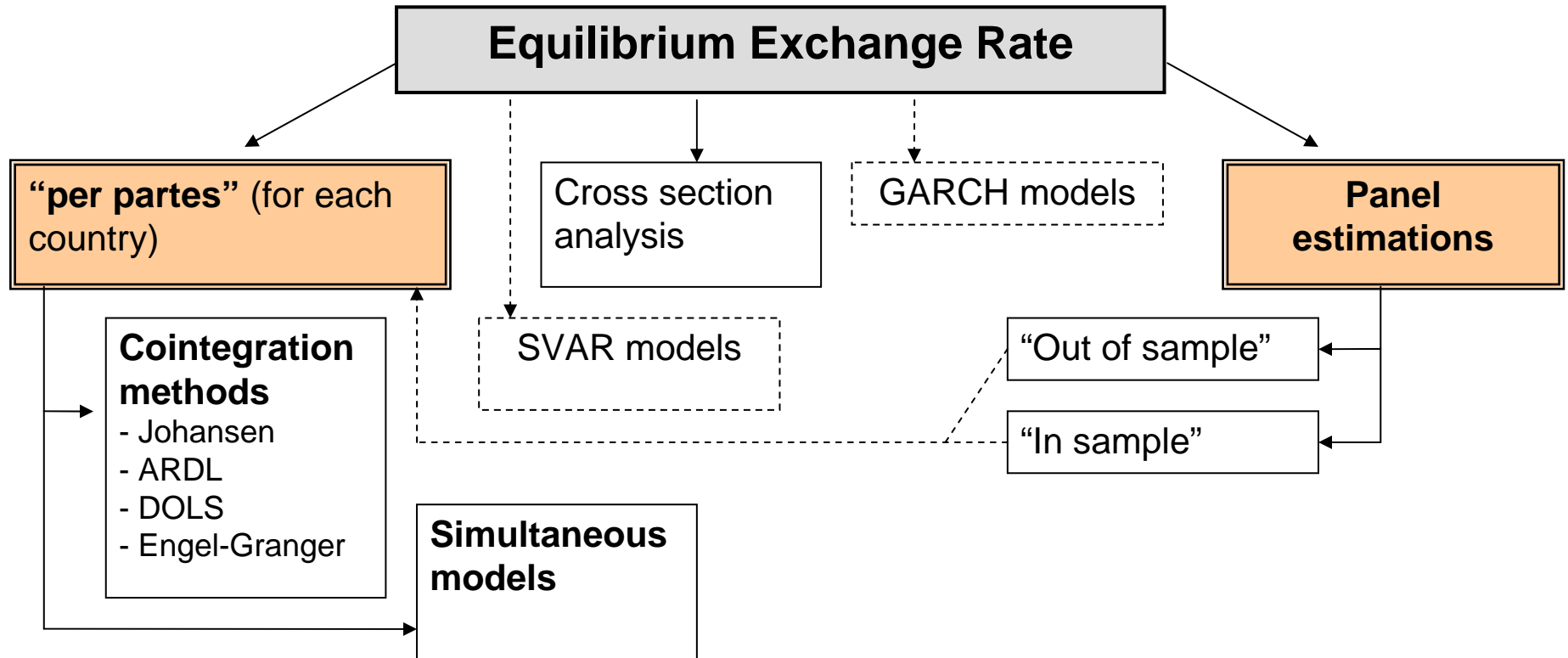
2. Models of the ERER

- **Positive approaches:** use current values of variables and current policies....
- **Normative approaches:** use not only current variables, but also „desirable“ model relationships and trajectories, which we would like to reach...

2.1 “Economic strategy” for estimating ERER



2.2 “Empirical strategy” for estimating ERER



3 ERER models used by the CNB

Regular Basis

BEER, FEER

- Estimated quarterly
- Real equilibrium exchange bands
- Input into core DSGE model (appreciation trend)

Research project

SRER

- Panel estimation of NMS
- Disequilibria due to great recession

Work in progress

NATREX

- Based on $(I-S) + CA = 0$

3.1 BEER (Behavioural Equilibrium Exchange Rate) for the Czech Republic

Dependent variable:

RER – real exchange rate deflated by PPI index

Independent variables:

DPROD – productivity differential (the Czech Republic against eurozone)

NFA – net foreign asset over GDP

THFK – real investment over GDP

NX – net export over GDP

3.2 BEER (Behavioural Equilibrium Exchange Rate) for the Czech Republic)

BEER: (Behavioural Equilibrium Exchange Rate), outcomes:

- Komárek, L. Melecký, M. (2007): "[The Behavioral Equilibrium Exchange Rate of the Czech Koruna](#)", Transition Studies Review, 14 (1), s. 105-121, 2007
- Komárek, L. – Melecký, M. (2008): "[Transitional appreciation of equilibrium exchange rates and the ERM II](#)", Transition Studies Review, 15 (1), s. 95-110, 2008
- Komárek, L. – Motl, M. (2012): Behavioral and Fundamental Equilibrium Exchange Rate of Czech Koruna. Politická ekonomie. No. 2, forthcoming.

3.3 FEER (Fundamental Equilibrium Exchange Rate) for the Czech Republic

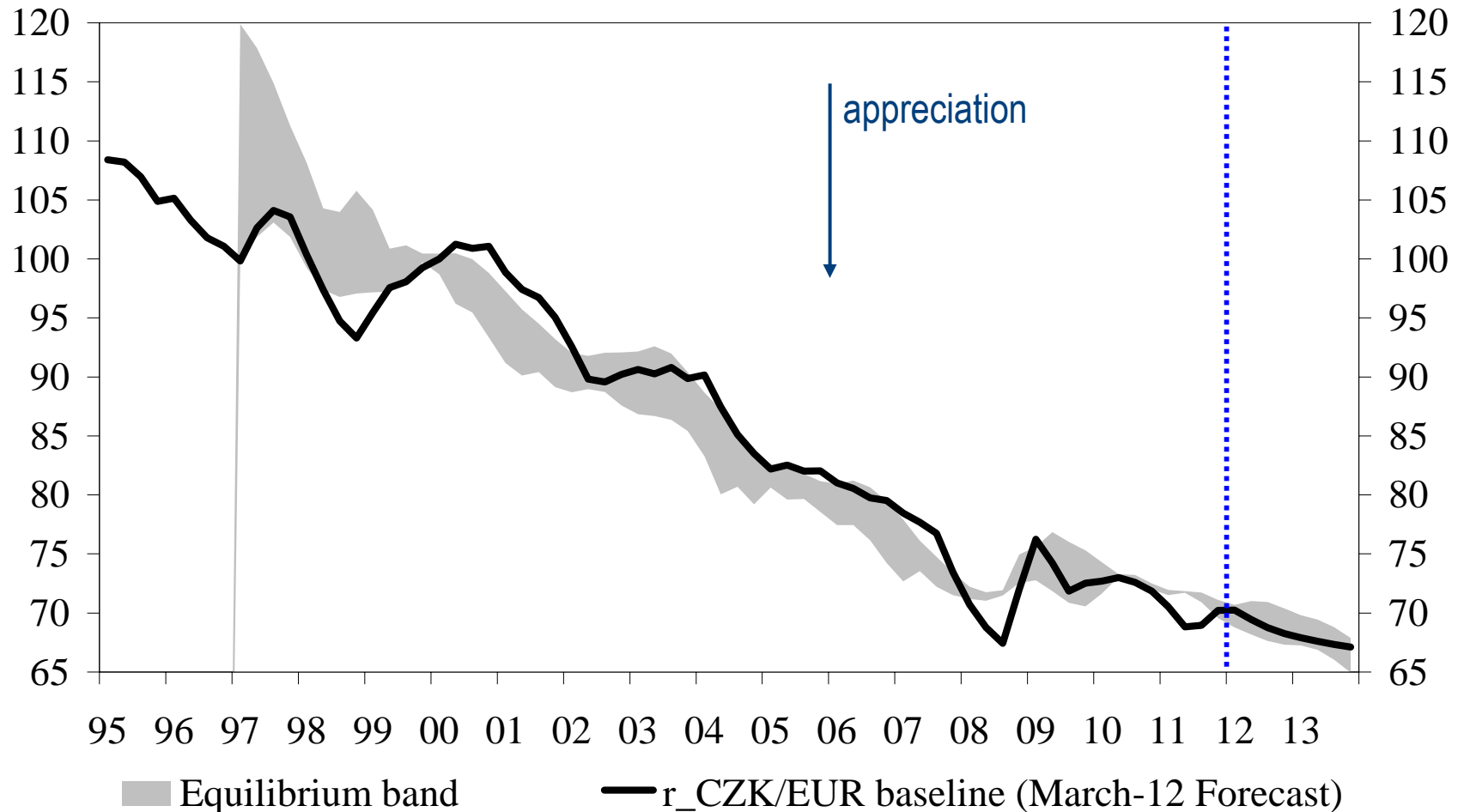
Structural model:

- export and import equation
- net export
- sustainable balance of the balance of payments
- deviation of the CA from external equilibrium
- potential GDP (Cobb-Douglas production function)

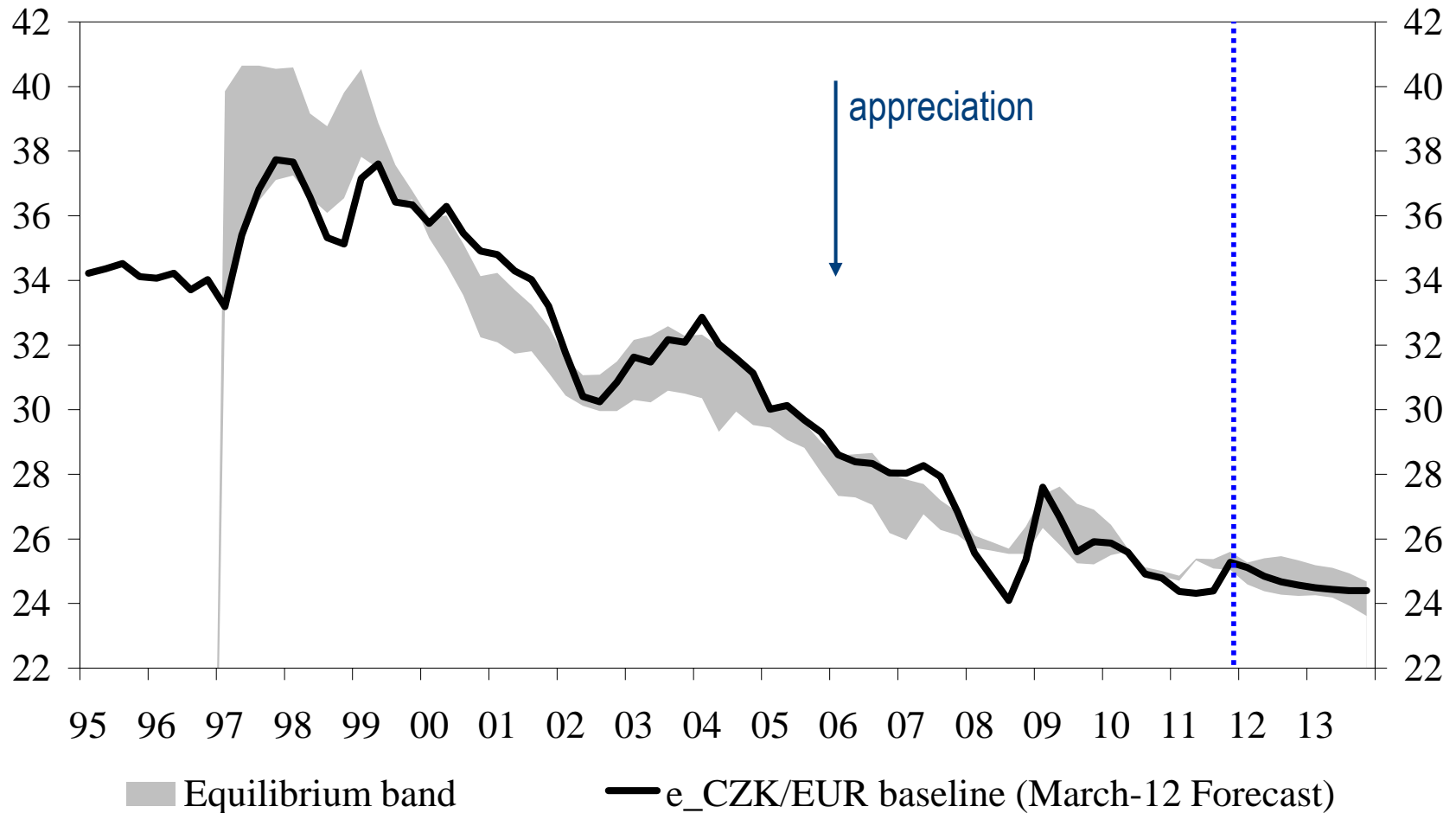
3.4 SRER (Sustainable Real Exchange Rate)

- Exchange rate that supports a sustainable level net external debt
- Estimated on a panel of new member states + control group (Greece, Portugal, Spain)
 - Estimation of trade equations (imports, exports)
 - Simulating real exchange rates that lead to sustainable levels of debt in the medium term, given debt targets and exogenous projections (such as external demand)
 - Determining the sustainable exchange rates
- Babecký, J. & Bulíř, A. & Šmídková, K. (2011). Sustainable Real Exchange Rates in the New EU Member States: What Did the Great Recession Change? *ČNB Working Paper Series 1*

4.1 Real equilibrium band (estimated by BEER and FEER)



4.2 Nominal equilibrium band (estimated by BEER and FEER)



5 Conclusions and future steps

- Important for an analysis of a small open economy
- Potential to identify misalignment, bubbles
- Three models of ERER:
 - BEER and FEER (similar outcomes): on a quarterly basis
 - SRER: panel of countries
- NATREX model (in progress)

5 Conclusions and future steps

- CNB's possible contribution:
 - Provide the methodology for EREER estimation
 - Possible participation in estimating EREER for ESCB members
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