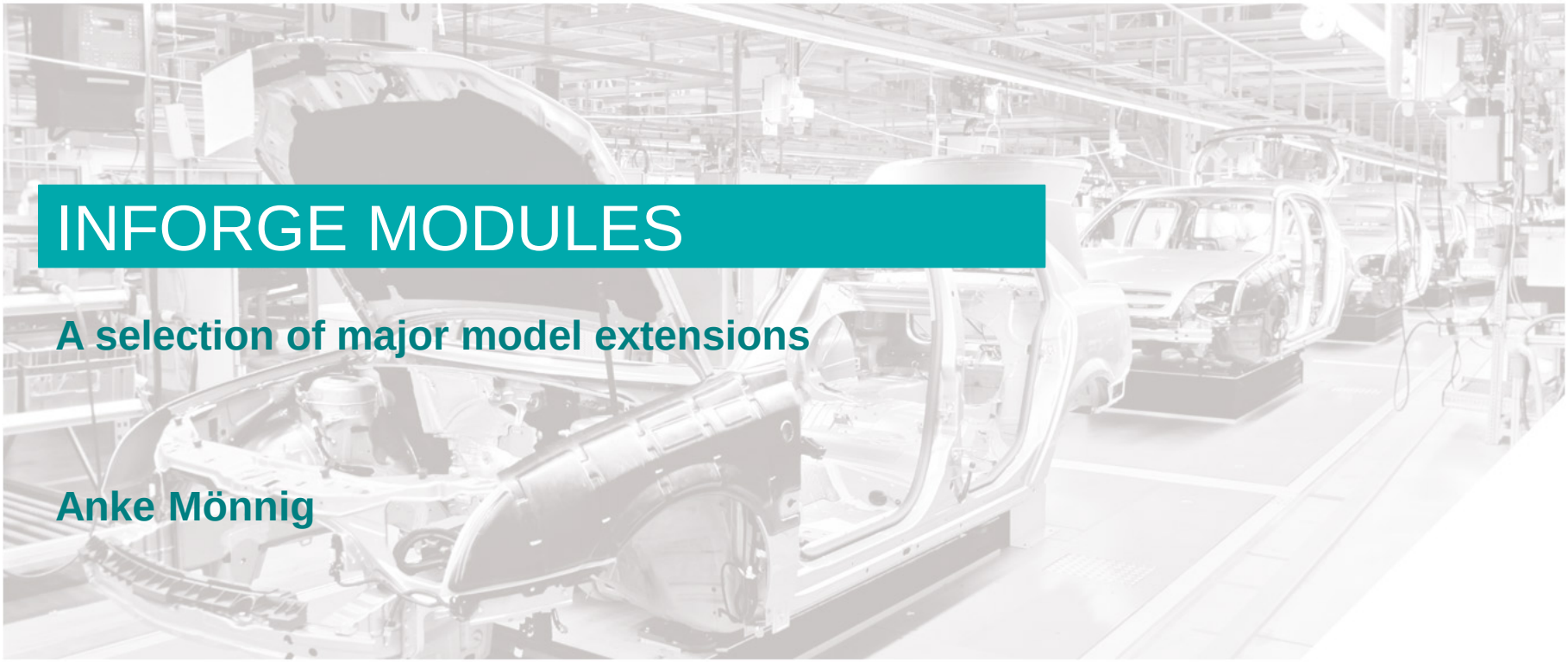
GWS SPECIALISTS IN EMPIRICAL ECONOMIC RESEARCH



INFORGE MODULES

A selection of major model extensions

Anke Mönnig

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1. Overview

Overview

- Keeping the map-perspective, INFORGE is a nice, tidy, smooth working model

- Ready for anaylising many research questions, related to e.g.
  - ⇨ industries
  - ⇨ economic actors
  - ⇨ regions
  - ⇨ taxes
  - ⇨ employment
  - ⇨ etc.

Overview

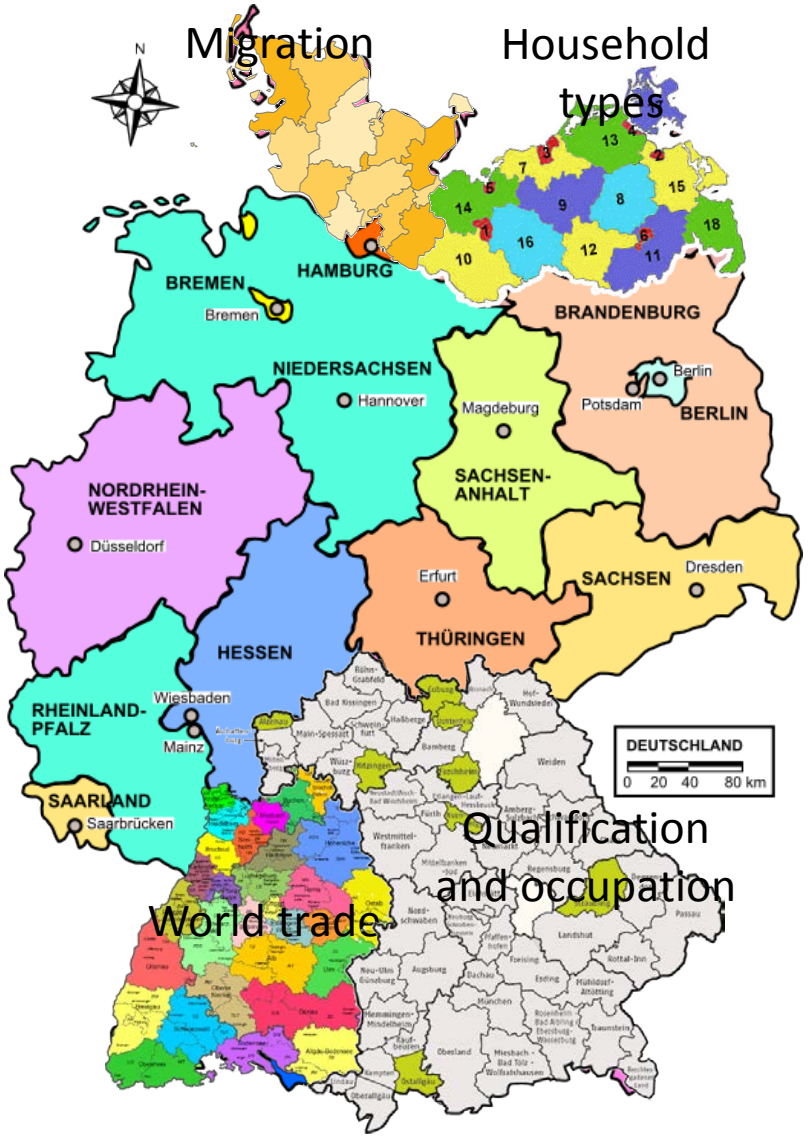
- „Only dead fish swim with the stream“

- INFORGE is subject to constant changes – over a period of 20 (or 40?) years

- Often „forced from the outside“ due to
  - ⇨ classification revisions
  - ⇨ omission of data
  - ⇨ due to projects
- but also „forced from the inside“ due to
  - ⇨ new data → new options
  - ⇨ new ideas
  - ⇨ improvement of „not so good“ approaches

Overview

- ... and it doesn‘t stop...
- Adding detail to the map with modules
- Modules partly with or without feedback to the core model
- E.g.
  - ⇨ world trade
  - ⇨ migration
  - ⇨ qualification and occupation
  - ⇨ household types



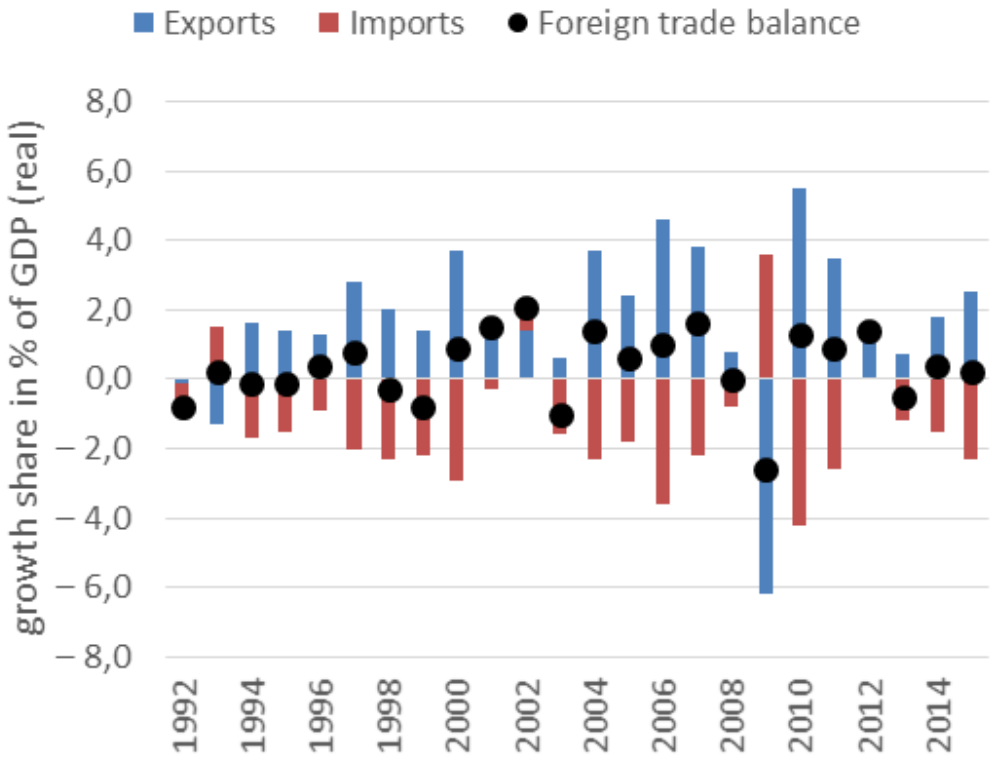
3. Modules

- **Empirical observation / motive**
- **Translated into INFORGE framework**
- **Graphical overview of module**

TINFORGE I – Trade for INFORGE

- World trade important for Germany‘s economic growth
- Especially for major sectors (cars, machineries, chemicals)
- But yet, INFORGE depends on third party projections

  ⇨ sequence of updates, economic perceptions etc. „not ours“.

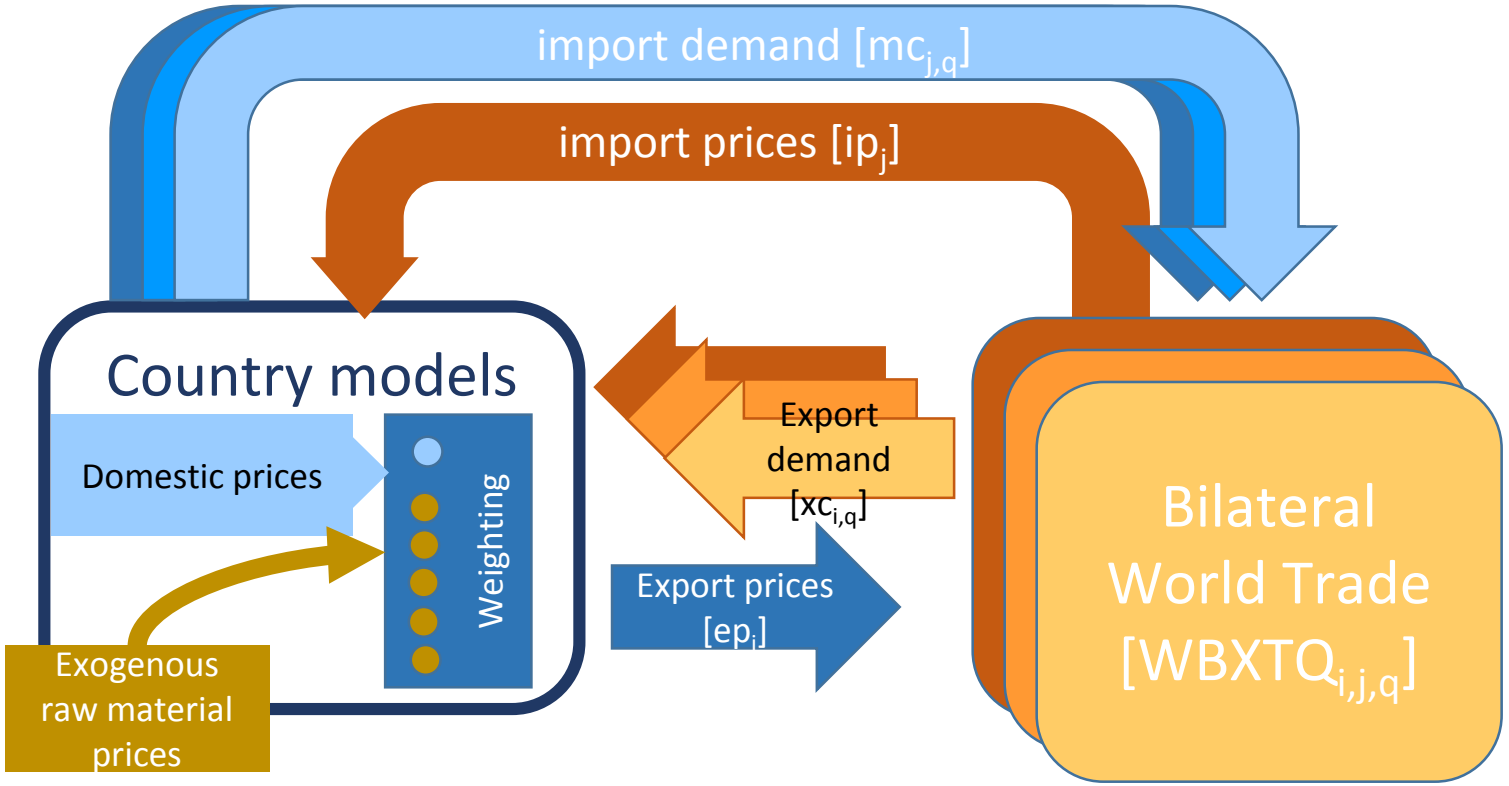


TINFORGE I – Trade for INFORGE

- Aim: get control over exogenous export vector in INFORGE
- Solution: „build my own“ world trade model TINFORGE
  - ⇨ simple
  - ⇨ easily integrated
  - ⇨ easily updated
  - ⇨ full coverage of world trade
- How: combine bilateral trade matrices (OECD) with macro models
  - ⇨ 154 bilateral trade matrices (by 32 products)
  - ⇨ 70 macro models (simple)
  - ⇨ export demand and import prices depend on trade
    - exports depend on other countries important demand → PULL
    - import prices depend on other countries export prices → PUSH

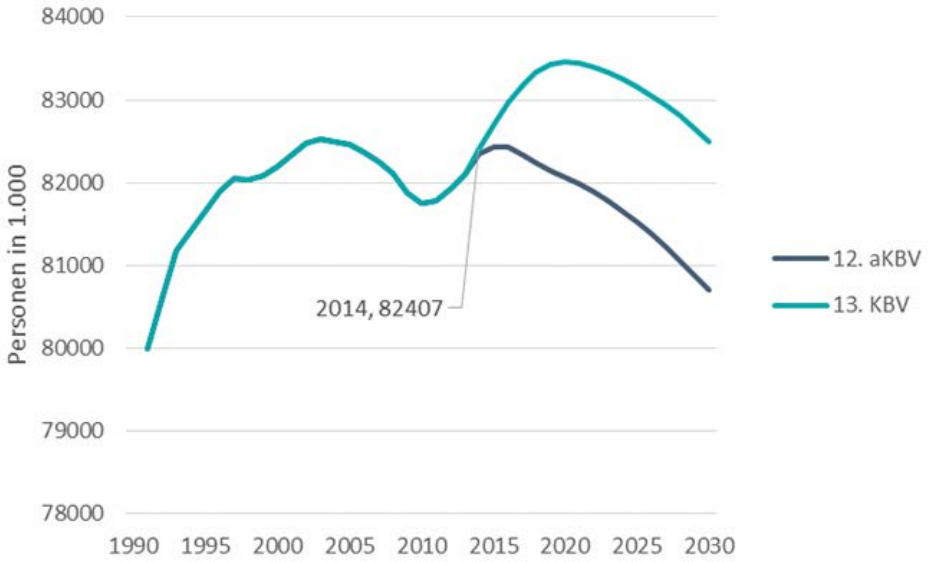
TINFORGE I – Trade for INFORGE

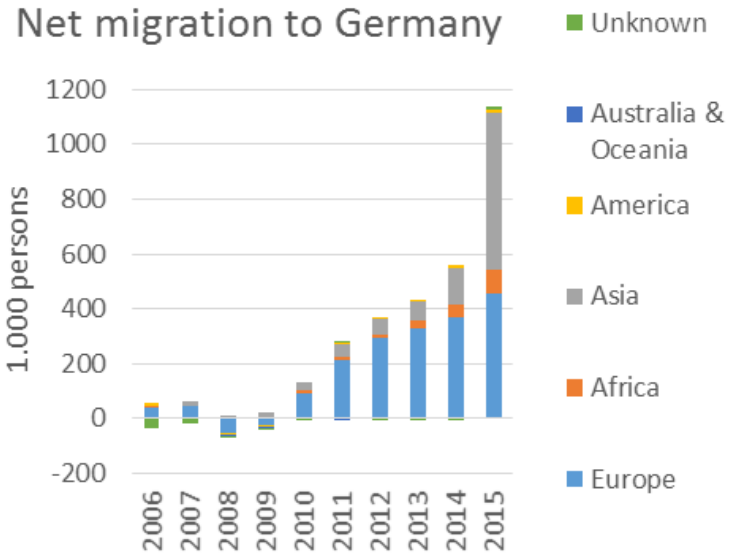
- Graphical overview



TINFORGE II – Imigration to Germany

- Population projections of third parties normally have no idea about migration
- The past has shown, that population projection continously failed.
- Influence of net migration underestimated
- There is a need to learn more about who is (will be) coming in terms of nationality, age, sex, qualification, motives for coming etc.





TINFORGE II – Imigration to Germany

- Aim: get control for net migration
- Solution: „build my own“ imigration model
  - ⇨ simple
  - ⇨ easily integrated
  - ⇨ easily updated
- How: Migration by nation, sex, age integrated in TINFORGE
  - ⇨ Take UN population forecast for countries
  - ⇨ Determing emigration ratio for 154 countries (share of emigration to Germany to total population in home country)
  - ⇨ Extrapolation of ratio according to emigration reasons (demographic, political, socio-economic)

TINFORGE II – Imigration to Germany

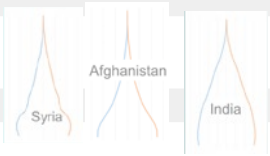
- Graphical overview

UN-Population Prospects

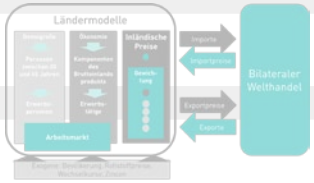
Emigration share* (CC → DE) for 2007 -2014 (AZR)

Case differentiation for determining future emigration share*

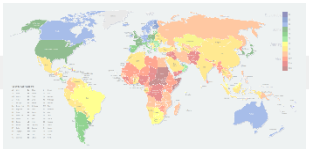
→ Case 1: demographic



→ Case 2: socio-economic



→ Case 3: (geo-)politics



(CC_1 → DE)

(CC_2 → DE)

(CC_3 → DE)

(CC_4 → DE)

(CC_5 → DE)

...

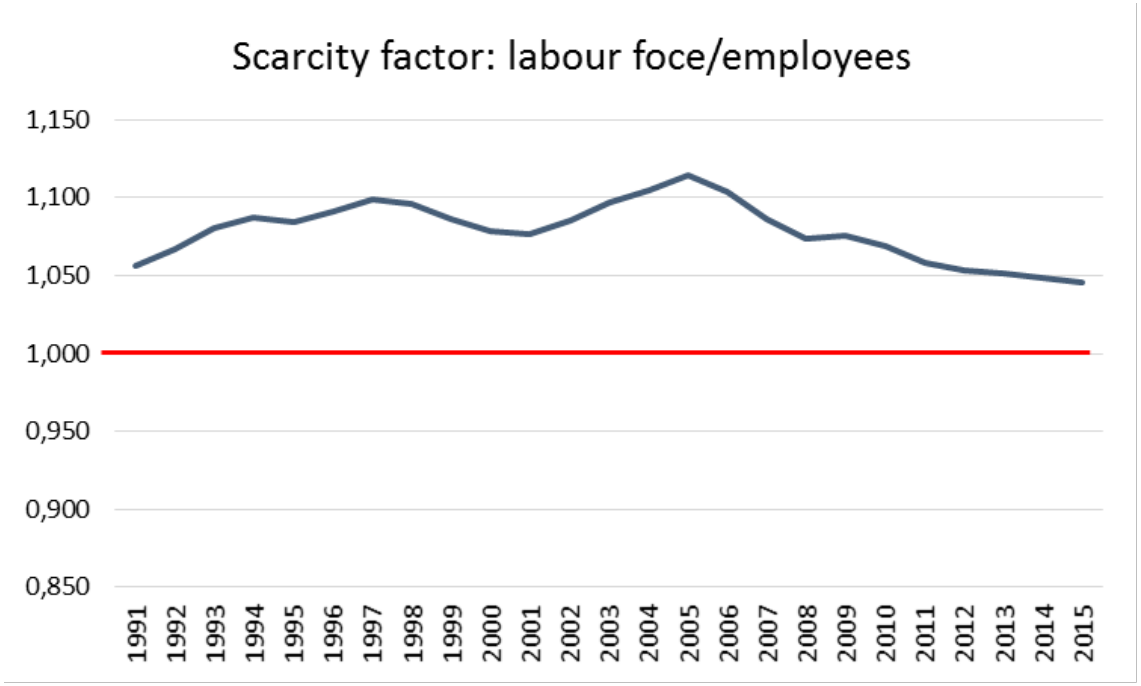
(CC_150 → DE)

Total emigration (∑ CC → DE)

* share of people emigrating from country cc to Germany DE

QINFORGE – Qualification and Occupation in INFORGE

- Increasing scarcity on labour market – especially in certain branches
- Need to learn more which occupations and qualifications are required in the future
- Support forward looking politics (education system)

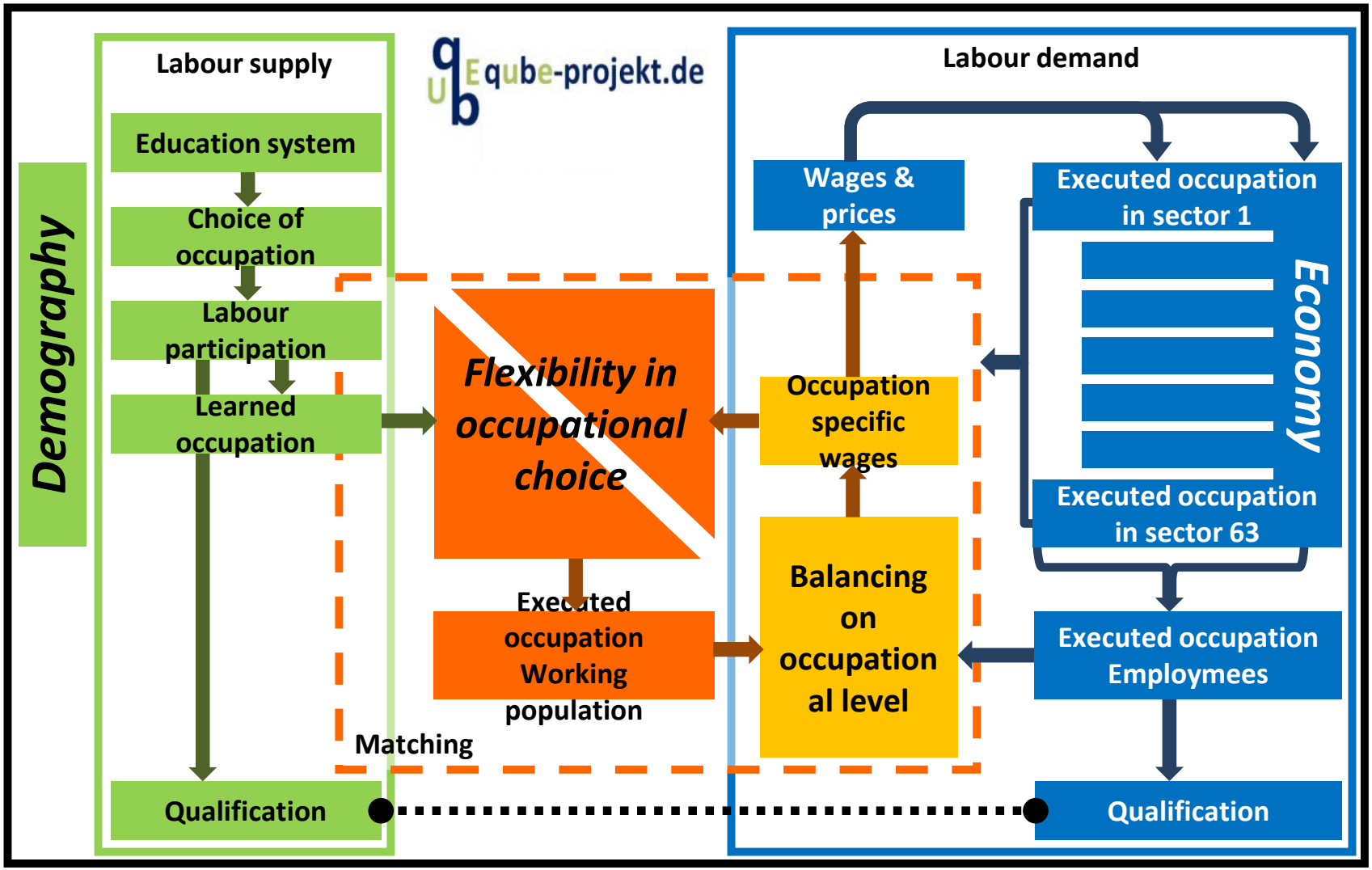


QINFORGE – Qualification and Occupation in INFORGE

- Aim: building a labour market beyond industry level with the aim to match both sides of the labour market
- Solution: using micro data for more information
- How: Labour demand and supply break-down to qualification and occupational levels
  - ⇨ Not „on our own“: The qube-projekt.de:
    - Federal Institute for Vocational Education and Training (BIBB)
    - Institute for Employment Research (IAB)
    - Fraunhofer Institute for Applied Information Technology (FIT)
    - Institute of Economic Structures Research (GWS)
  - ⇨ Collaboration since 10 years
    - Entering know the 4th version of QINFORGE model
    - Over the years, approach got more and more sophisticated, together with more and better data

QINFORGE – Qualification and Occupation in INFORGE

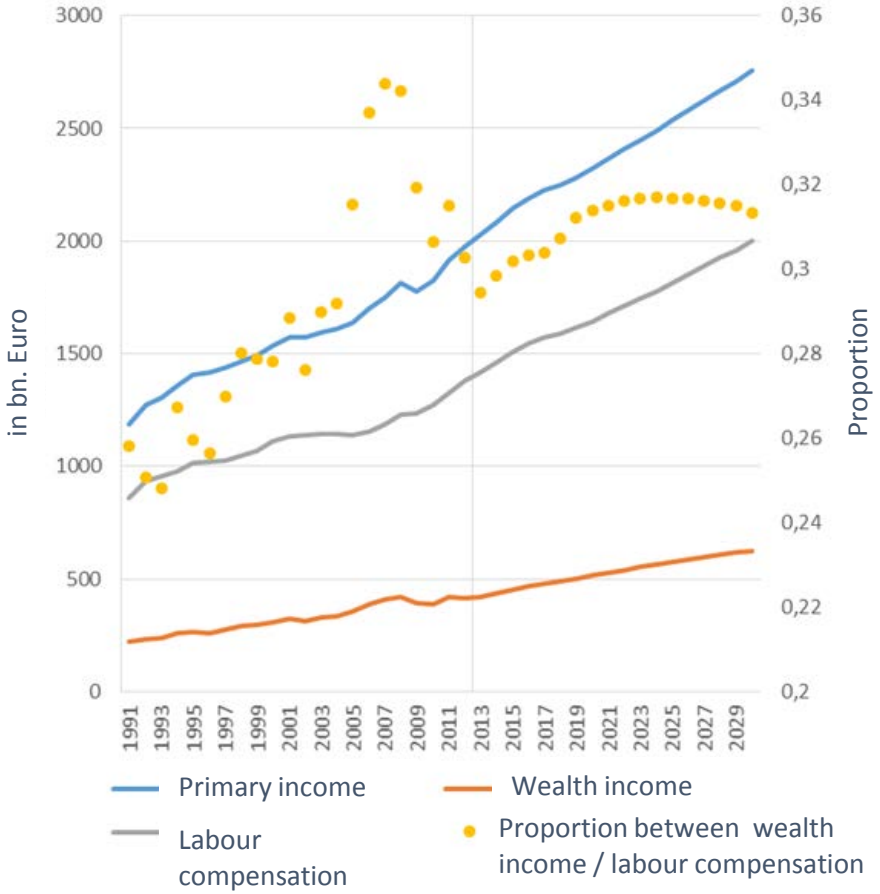
- Graphical overview



DEMOS

- Driving force: Project „Reporting on socio-economic development in Germany“, 2013-2016
- Inequality has risen
- Need to learn about **who** contributes to economic growth, **how** they consume and how they earn their income.

- Components of primary income of private households



DEMOS

- Aim: determination of household consumption by householdtypes
- Solution: integration of sample census data
- How: combining meso with macro data

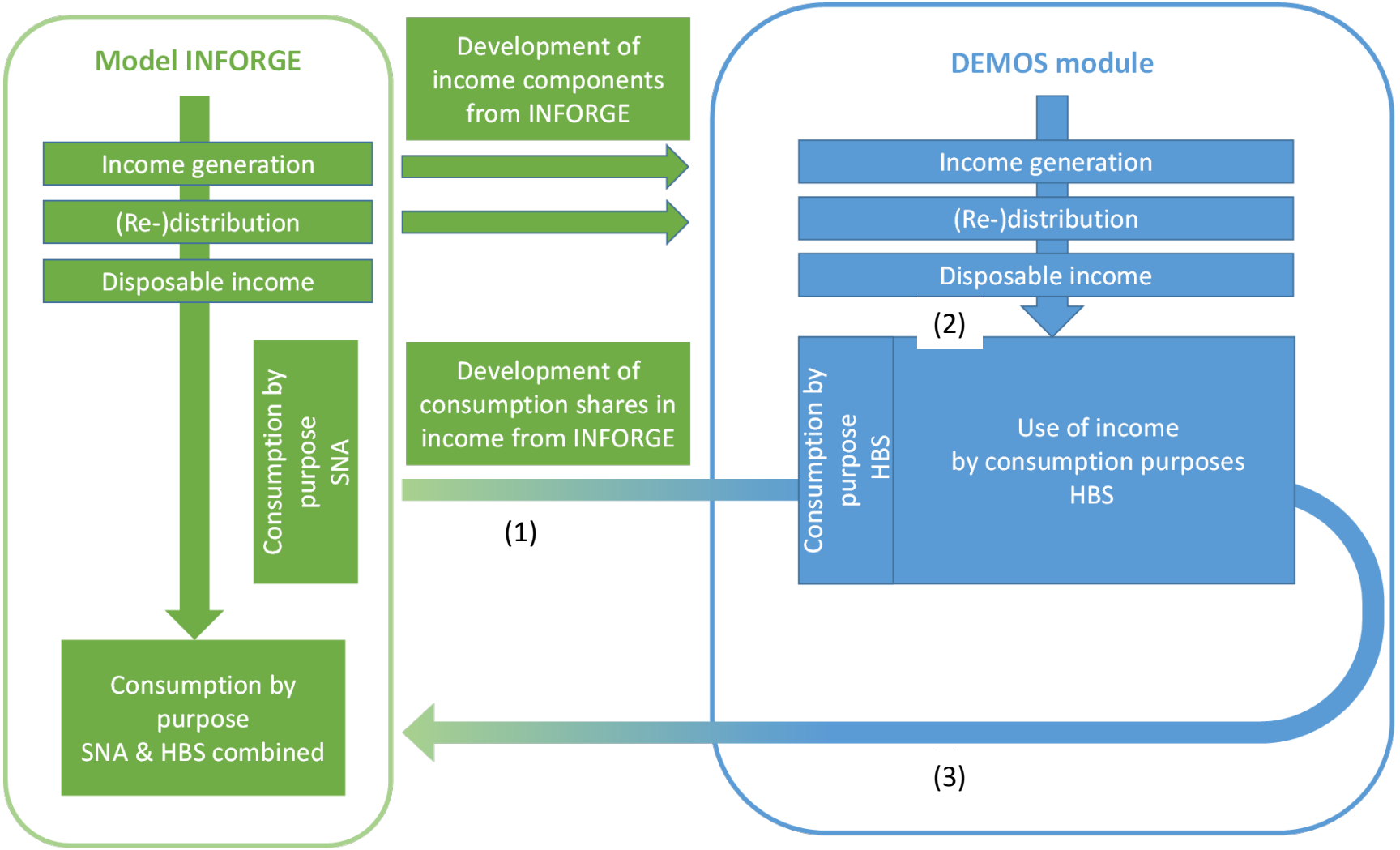
(1) INFORGE results of estimated consumption purposes of private households

(2) Dynamic is transferred to consumption structure of different household types

(3) Feedback to INFORGE by extrapolation with growth rates of new consumption by purposes

DEMOS

- Graphical overview



3. Outlook

Outlook

- Research areas
  - ⇨ Digitization (4th industrial revolution)
  - ⇨ Globalisation / trade:
    - Sustainable Development Goals
    - Criticism on globalisation: optimal „boarder opening“, etc.
    - Social impact of trade: social footprint/labour footprint, etc.
  - ⇨ Migration
- Intensifying socio-economic modelling
  - ⇨ bridging to micro level
  - ⇨ social monitoring
- Model extensions:
  - ⇨ Population projection
  - ⇨ Regional Input-Output analysis
  - ⇨ Modelling on municipality level (LAU 2 (NUTS 5) level)

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