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CONSIDERING OCCUPATIONAL FLEXIBILITY IN DEMAND AND SUPPLY FORECASTS OF OCCUPATIONS

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“Methodologies of long-term forecasting”

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Why consider occupational flexibility?

- High standardization of vocational education and training (VET) in Germany
  - Federal regulations on medium skill level (ISCED 3b)
- If we want to identify possible skill mismatches, it is not enough to consider the qualification level only
- What qualifies somebody to examine certain tasks?
  - It is not enough to look on employment development in sectors only.
  - It is essential to group occupations according to the main focus of activity (to avoid “taxonomical changes”)
- Occupation as the link between qualification and job requirements
- To provide policy advice, we have to consider not only developments of supply and demand of occupations but also to investigate the balancing process => occupational flexibility

Summary of structure

1. BIBB-IAB model set-up (construction)
2. Results of occupational fields projections
3. What if...? The power of scenarios
4. Drivers of occupational mobility
5. Different assumptions of mobility behavior
6. Challenges of the concept

1. BIBB-IAB model set-up - Instituts

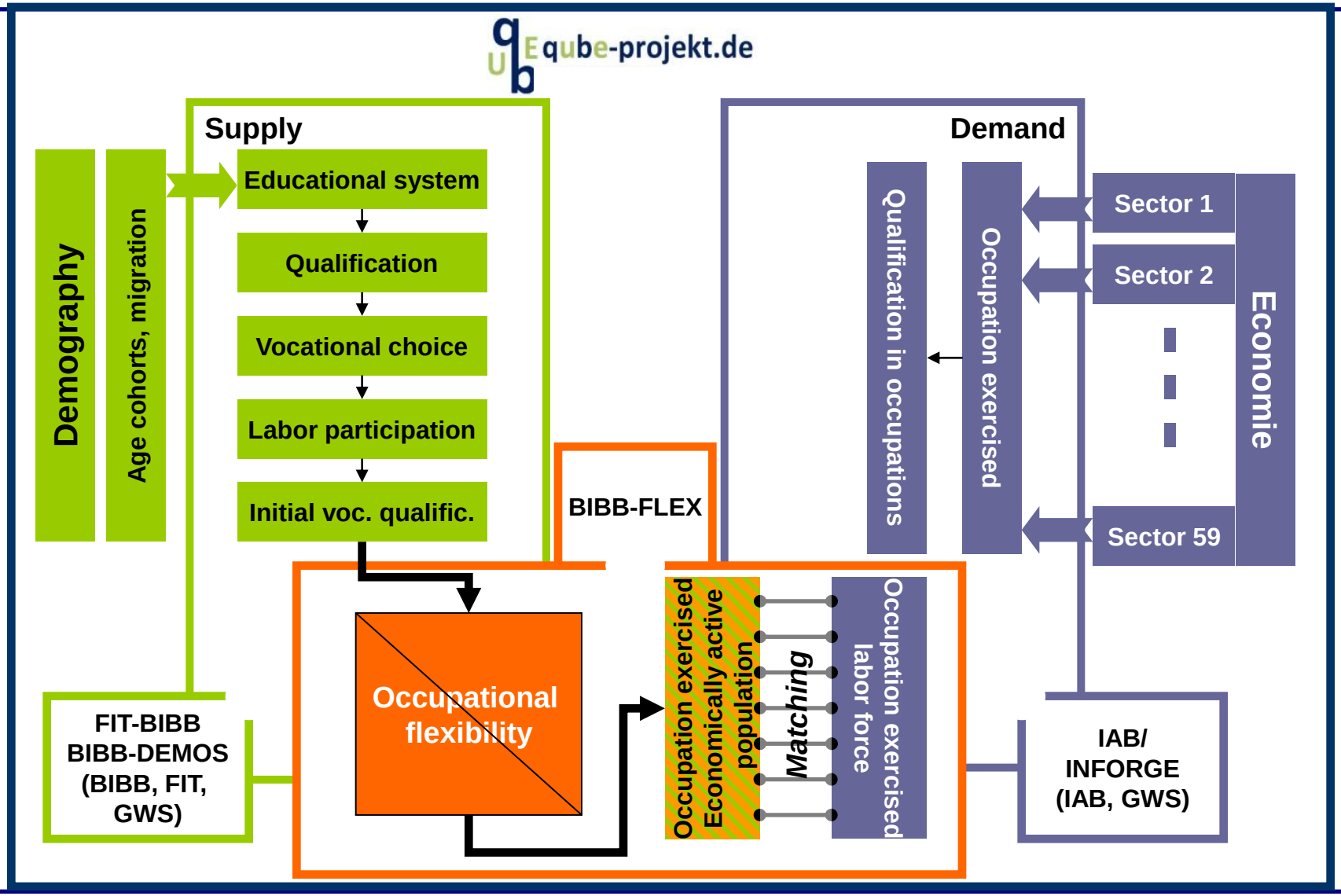
- Federal Institute for Vocational Education and Training (BIBB)
  - Data generation, taxonomy (occupational fields, initial vocational qualification)
- Institute for Employment Research (IAB)
  - Demand projection [IAB/INFORGE-model (integral element of the GINFORS global model of GWS)]
- Fraunhofer Institute for Applied Information Technology (FIT)
  - Supply projection 1 (BIBB-DEMOS model)
- Institute of Economic Structures Research (GWS)
  - Supply projection 2 (BIBB-FIT model)
- BIBB
  - Occupational flexibility matrix

1. BIBB-IAB model set-up – Occupational Fields

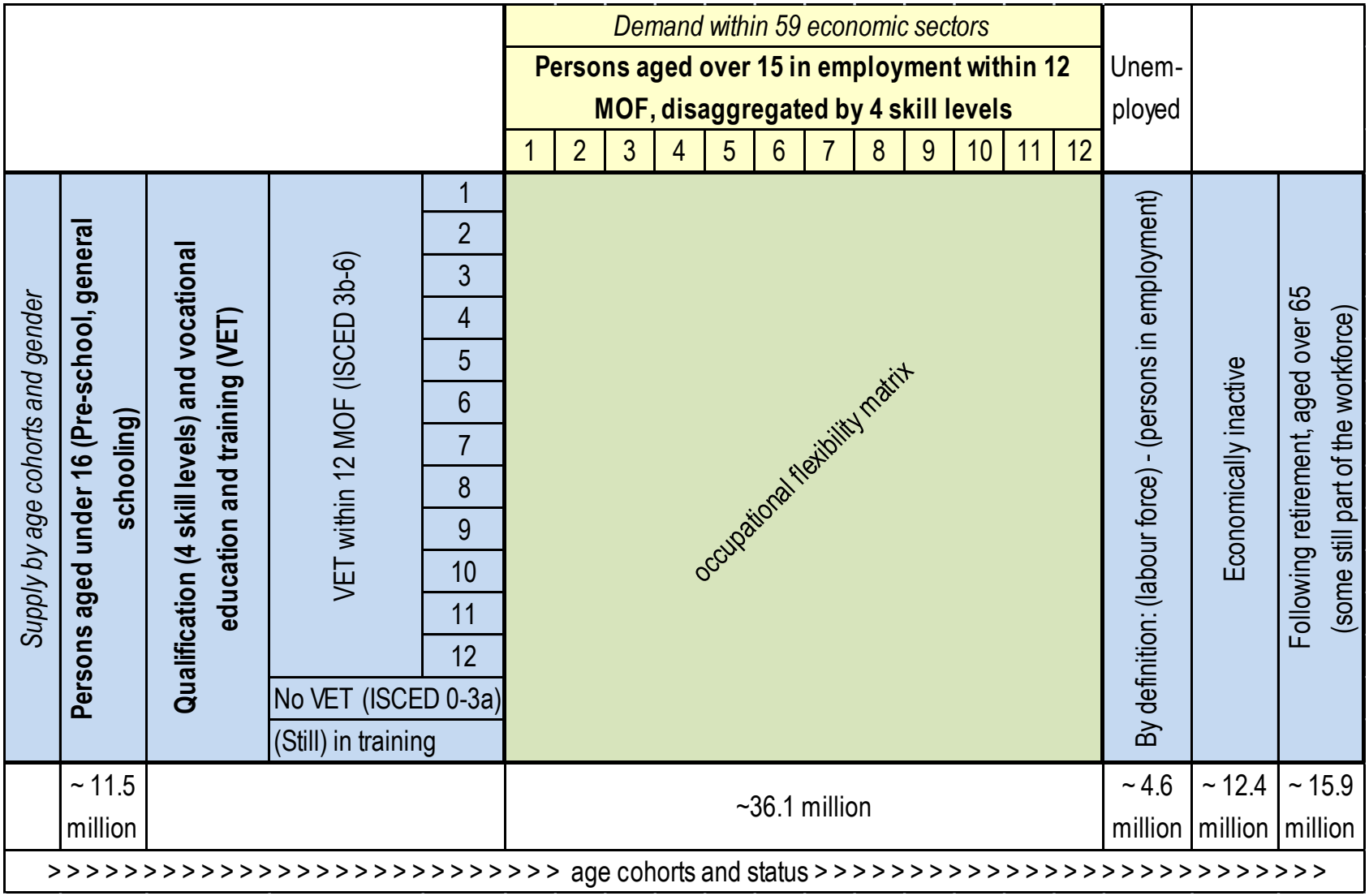
3 top-level Occupational Domains	12 Major Occupational Fields (main focus of activity microcensus)	54 Occupational Fields	Main focuses of activity microcensus
Production-related occupations Occupational fields: 1-13, 15, 17, 18, 20, 42	Raw material extraction occupations *(2)*	1, 2	Harvesting *(2)*, supplying *(3)*, processing and manufacturing *(4)*, repairing *(6)*, controlling and maintaining machines *(1)*
	Processing, manufacturing and repair occupations *(4, 6)*	3, 7, 9, 10, 11, 13, 15, 18, 20, 42	
	Occupations involving the control and maintenance of machines and plants *(1)*	4-6, 8, 12, 17	
Primary service occupations Occupational fields: 14, 16, 19, 27-30, 32-34, 36, 37, 39-41, 43, 53, 54	Occupations involving trade and sale of goods *(5)*	27, 28, 30	Commercial activities *(5)*, office activities *(7)*, general services such as cleaning *(19)*, entertaining guests *(12)*, warehousing *(18)*, transport *(18)*, security *(20)*
	Occupations involving traffic, warehousing, transport, security, guarding *(18)*	19, 32, 33, 34, 41, 43	
	Hotel and restaurant and cleaning occupations *(12, 19)*	14, 16, 53, 54	
	Office, commercial service occupations *(7)*	29, 36-37, 39, 40	
Secondary service occupations Occupational fields: 21-26, 31, 35, 38, 44-52	Technical and scientific occupations *(9, 7, 8)*	21-26, 38	Researching *(8-9)* , developing *(8-9)*, organising *(10-11)*, managing *(10-11)*, applying and interpreting the law *(13)*, providing support *(16)*, healing *(16)*, caring *(16)*, advising *(15)*, teaching *(14)*, journalism *(17)*, entertainment *(17)*
	Legal, management and economic occupations *(11, 13, 15)*	35, 44	
	Artistic, media, humanities and social science occupations *(17, 10, 9)*	31, 45, 46, 51	
	Health and social occupations, body care providers *(16)*	47-49, 52	
	Teaching occupations *(14)*	50	

Source: Bott , Peter; Helmrich, Robert; Schade, Hans-Joachim; Weller, Sabrina-Ines (2010): Datengrundlagen und Systematiken für die BIBB-IAB Qualifikations- und Berufsfeldprojektionen.In: Helmrich, Robert; Zika, Gerd (Ed.): Beruf und Qualifikation in der Zukunft. Bonn 2010

1. BIBB-IAB model set-up - Overview

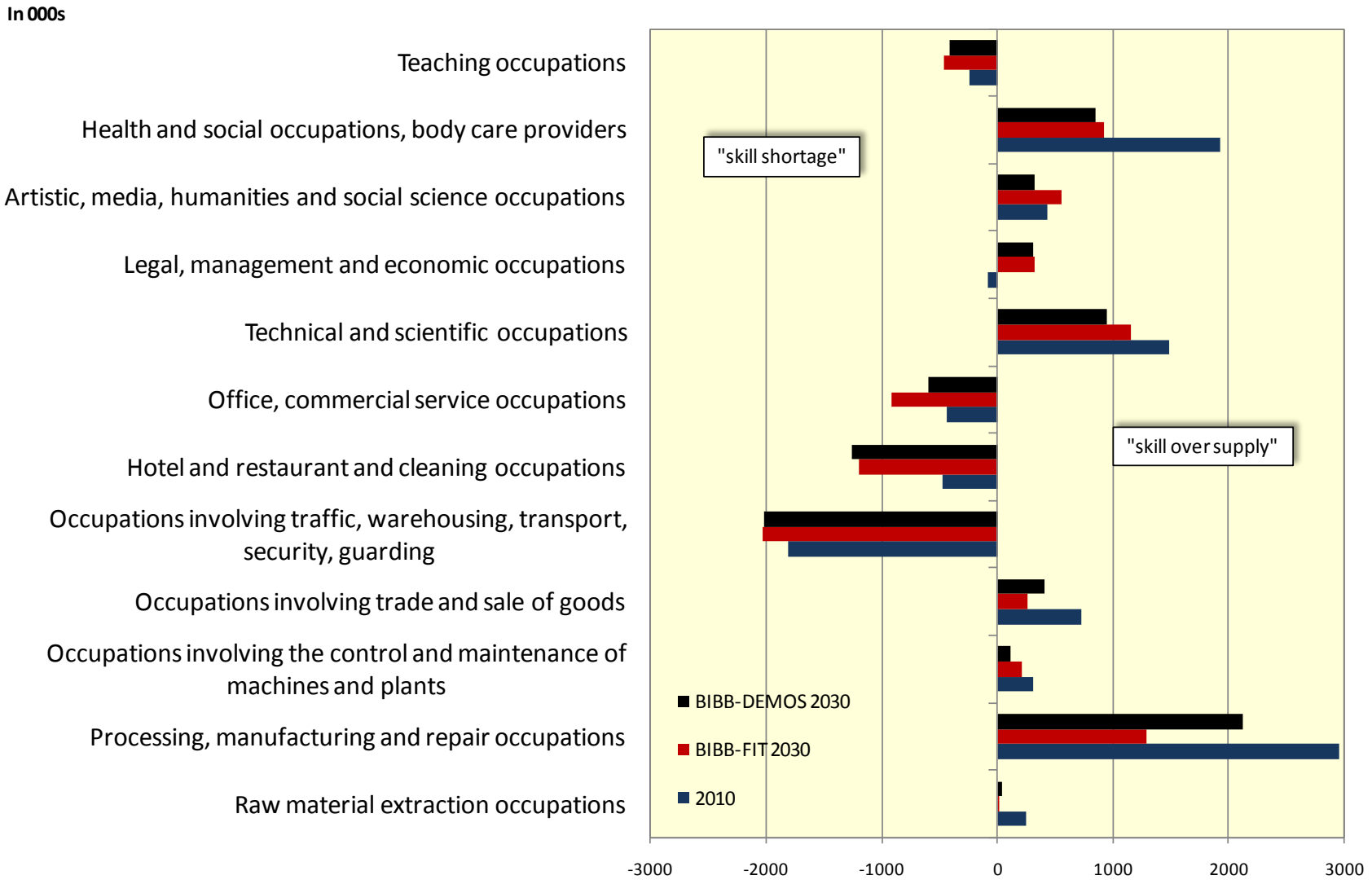


1. BIBB-IAB model set-up - Cross-sectional analysis of the population according to their relevance for the labour market



Data source: Microcensus 2005 of the German Federal Statistical Office; own illustration.

2. Results of occupational field projections -
Supply and demand (trained occupation only)



2. Results of occupational field projections –
Flexibilities from Microcensus 2005(-2008)

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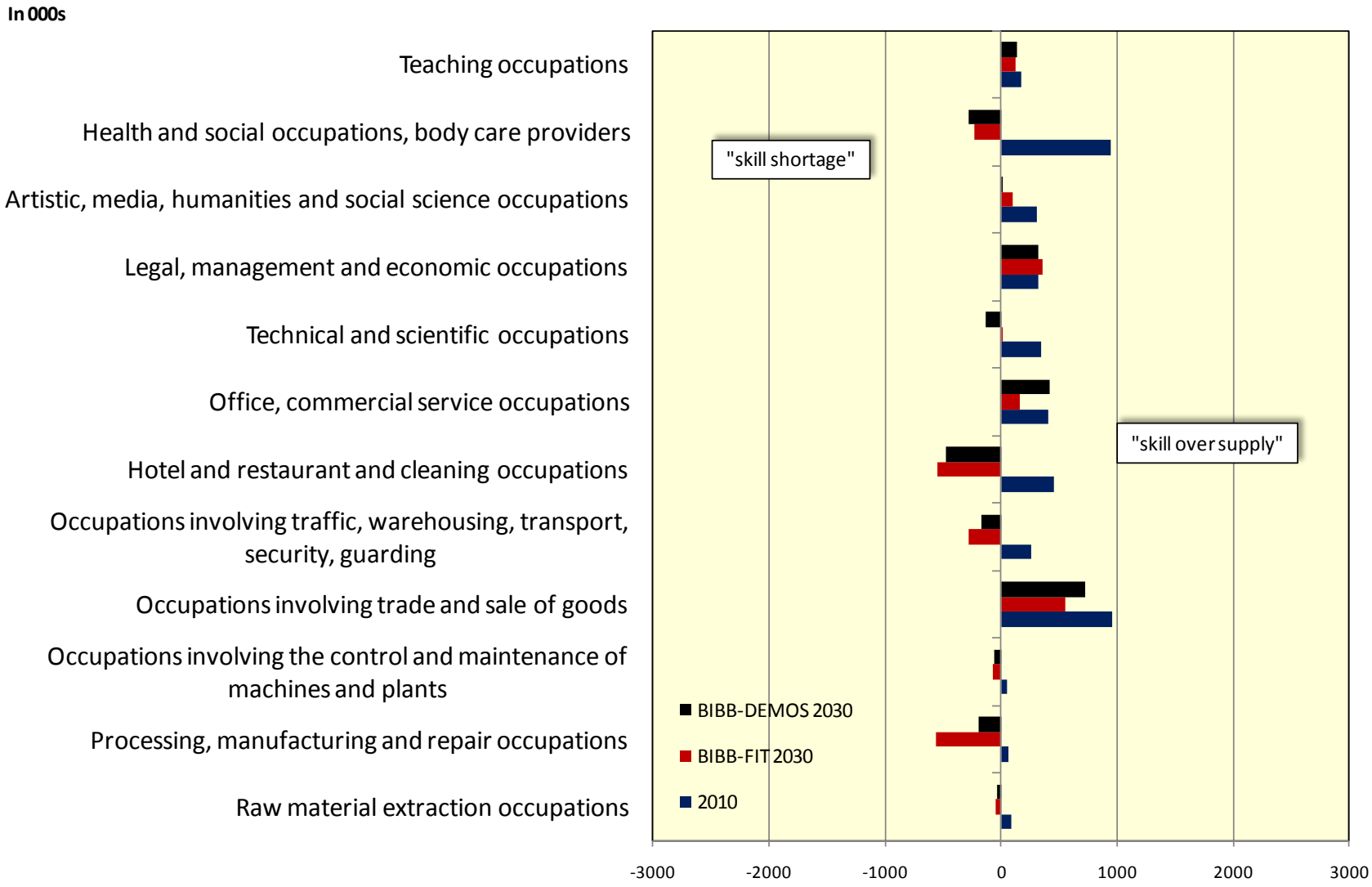
Major occupational field (MOF) of the occupation learned	Proportional values for change from major occupational field (MOF) learned to major occupational field exercised												
	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	P 9	P 10	P 11	P 12	∑ MOF
1: Raw material extraction occupations	49.5%	8.6%	3.0%	6.3%	12.8%	6.1%	5.1%	2.6%	2.1%	0.7%	2.3%	0.9%	**100.0%**
2: Processing, manufacturing and repair occupations	1.9%	46.3%	7.8%	6.2%	15.6%	5.7%	4.2%	7.4%	2.0%	0.9%	1.5%	0.5%	**100.0%**
3: Occupations involving the control and maintenance of machines and plants	1.3%	14.0%	44.3%	5.2%	11.9%	4.7%	4.4%	7.8%	2.0%	2.4%	1.7%	0.4%	**100.0%**
4: Occupations involving trade and sale of goods	0.8%	2.9%	1.2%	50.4%	6.2%	9.5%	19.8%	1.3%	3.4%	1.1%	3.1%	0.4%	**100.0%**
5: Occupations involving traffic, warehousing, transport, security, guarding	1.1%	6.1%	2.0%	4.3%	65.3%	3.8%	11.5%	2.2%	1.4%	0.5%	1.3%	0.5%	**100.0%**
6: Hotel and restaurant and cleaning occupations	3.1%	5.0%	2.6%	9.7%	8.2%	56.4%	7.3%	1.1%	1.8%	0.5%	3.7%	0.7%	**100.0%**
7: Office, commercial service occupations	0.5%	1.2%	0.5%	8.6%	3.7%	3.5%	71.3%	2.0%	4.8%	1.1%	2.3%	0.5%	**100.0%**
8: Technical and scientific occupations	0.7%	8.9%	3.3%	5.0%	4.1%	2.3%	8.0%	52.0%	7.3%	3.2%	1.7%	3.5%	**100.0%**
9: Legal, management and economic occupations	0.2%	0.8%	0.2%	7.3%	2.3%	1.5%	26.0%	4.2%	49.3%	4.1%	1.4%	2.7%	**100.0%**
10: Artistic, media, humanities and social science occupations	0.3%	2.2%	0.8%	6.1%	2.3%	2.8%	10.2%	5.1%	5.9%	46.9%	4.3%	13.0%	**100.0%**
11: Health and social occupations, body care providers	0.4%	2.1%	0.4%	3.9%	1.7%	4.0%	6.3%	0.8%	1.1%	0.9%	74.6%	3.7%	**100.0%**
12: Teaching occupations	0.3%	1.2%	0.3%	1.9%	1.5%	2.1%	4.3%	1.2%	1.3%	2.2%	4.5%	79.3%	**100.0%**
0a: no vocational training (unskilled)	3.2%	16.1%	6.0%	11.3%	15.1%	25.5%	10.8%	2.5%	1.7%	1.9%	5.2%	0.8%	**100.0%**
0b: at school/in training	2.1%	19.8%	5.4%	14.5%	5.8%	13.0%	17.2%	4.8%	0.7%	3.1%	12.2%	1.3%	**100.0%**

Source: Maier, Tobias; Schandock, Manuel; Zopf, Susanne (2010): Flexibilität zwischen erlerntem und ausgeübtem Beruf.In: Helmrich, Robert; Zika, Gerd (Ed.): Beruf und Qualifikation in der Zukunft. Bonn 2010

2. Results of occupational field projections -
Supply and demand (incl. occupational flexibility)



3. What if…? The power of scenarios

- What can be manipulated (e.g.)?
  - Supply:
    - Demographical development: migration behaviour
    - Educational participation: dropout rates at school and university
    - Participation of employment: participation rates (women, elderly)
  - Demand:
    - Economic structural change: investment in research and development
    - Globalisation, growth: export sensitivity
    - Technological change: skill upgrade
  - Balance of supply and demand:
    - Occupational flexibility
    - (Worktime volume)

4. Drivers of occupational mobility

- Human capital theory:
  - Higher productivity through investment in human capital (general, specific)
  - Changing the occupation should lead to a loss of specific human capital and therefore result in lower productivity
    - Why should somebody leave the initial vocational qualification?

- Search and matching theories
  - Occupational changes as results of a searching process that aims for optimal placement on the labor market.

- Difference between voluntarily and involuntarily occupational changes

5. Different assumptions of mobility behavior

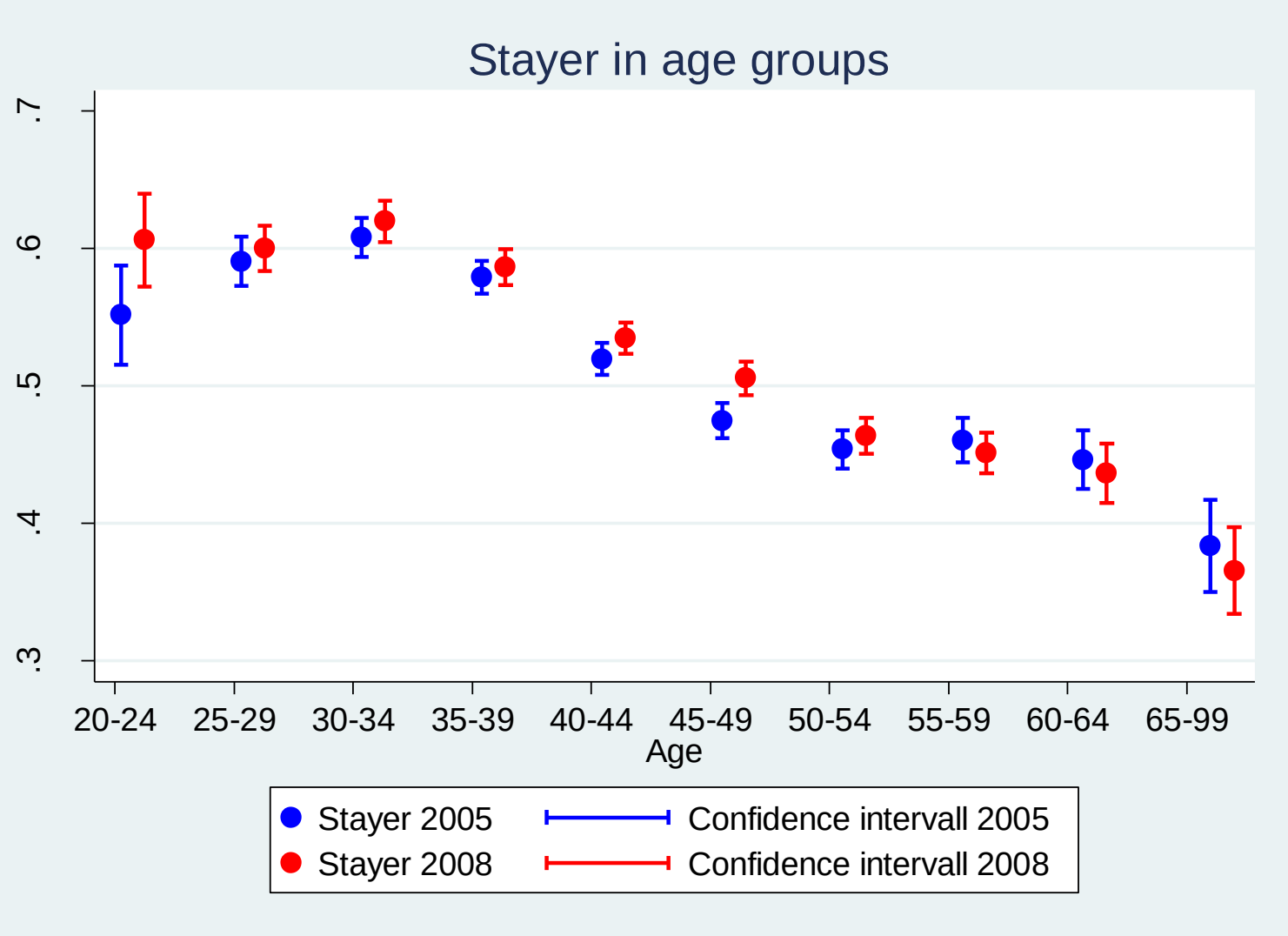
- At the current state of the project the flexibility matrix is used statically.

- On the level of MOF, the matrices are distinguished between 4 age- groups (15-29, 30-39, 40-49, 50-99), 4 qualification levels (ISCED 1,2,3a; ISCED 3b,4; ISCED 5b; ISCED 5a,6) and gender.
  - Persons still in training are not differentiated in age and qualification already achieved.

- However, scenarios can still be calculated
  - Age or cohort specific mobility behavior?

5. Different assumptions of mobility behavior

E.g. Technical scientific occupations



Source: German Microcensus 2005-2008; own calculations

5. Different assumptions of mobility behavior
E.g. Technical scientific occupations

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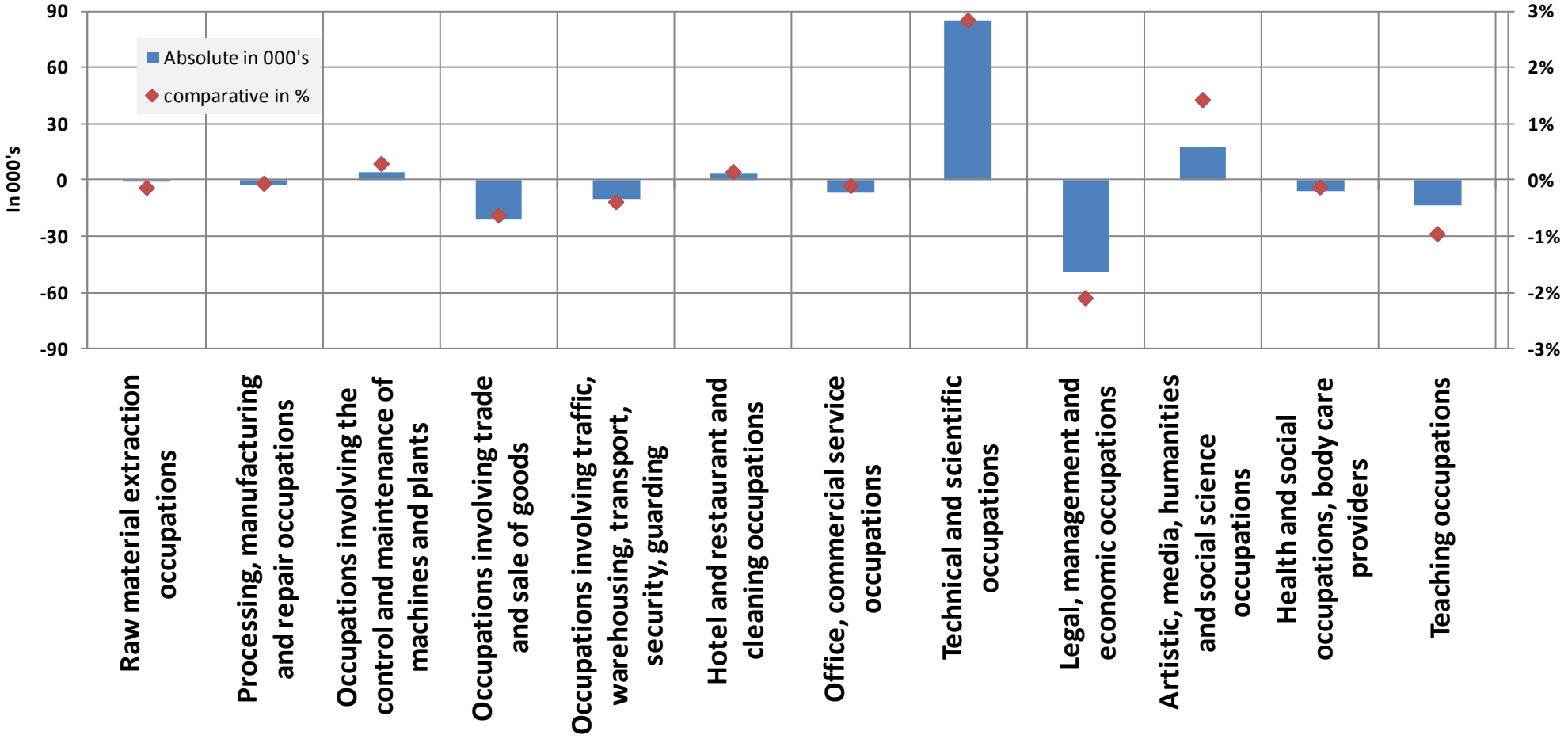
- What if the mobility behavior of a younger age cohort (e.g. 25-29) is passed on to the following age cohort (e.g. 30-34)? (results for 2030)



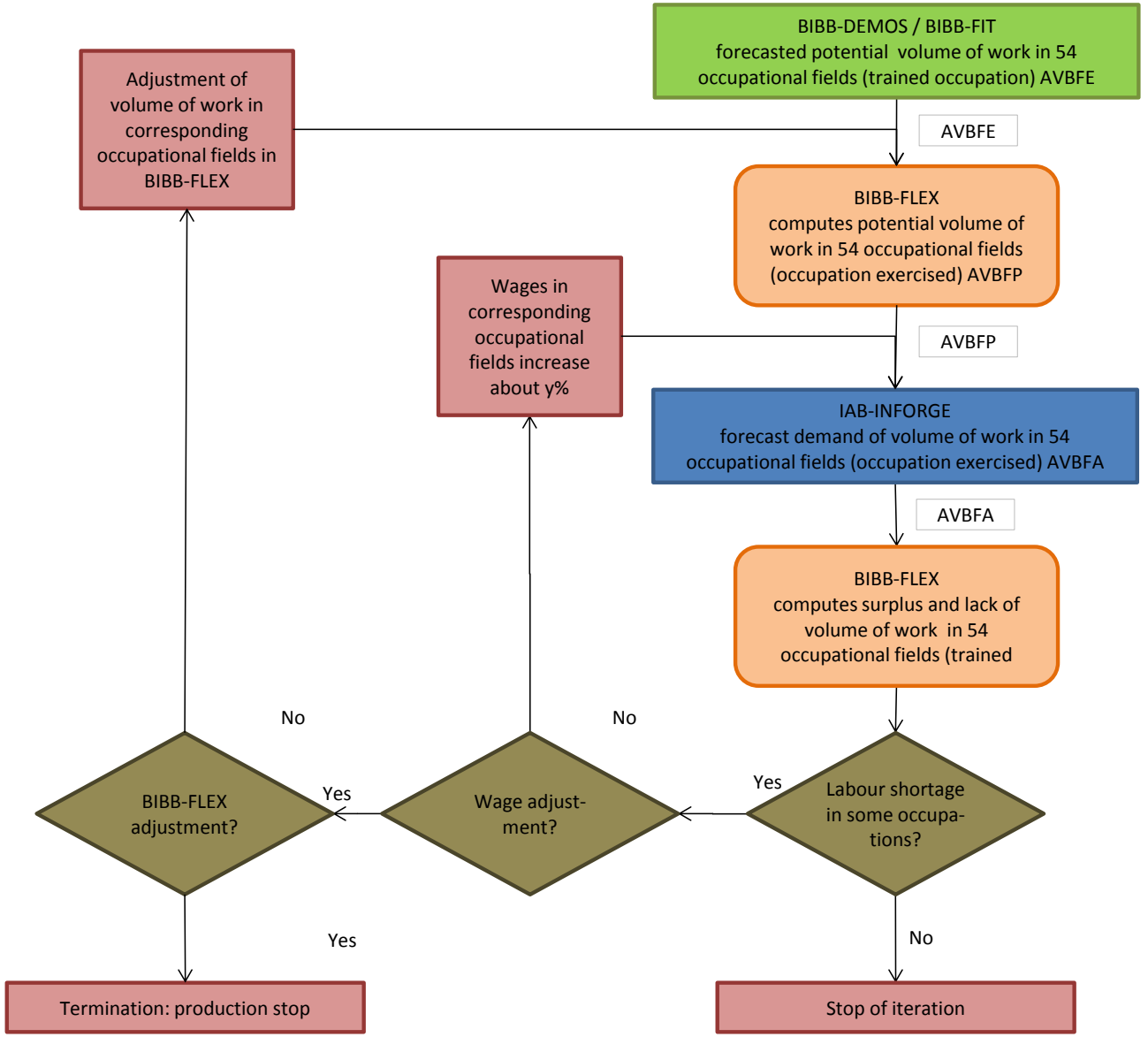
Source: Microcensus 2008, BIBB-DEMOS; own calculations

6. Challenges of the concept

- Individual mobility behavior vs. macro level data

- How to model voluntary and involuntary occupational changes?
  - Indirect link through qualification-specific mobility tables
  - Dynamic modeling:
    - Wage increases
    - Indicator for “potential over supply” / unemployment rate by occupation?

6. Challenges of the concept



- How to integrate mobility behavior in the forecast?

Thank you very much for your attention!

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