

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

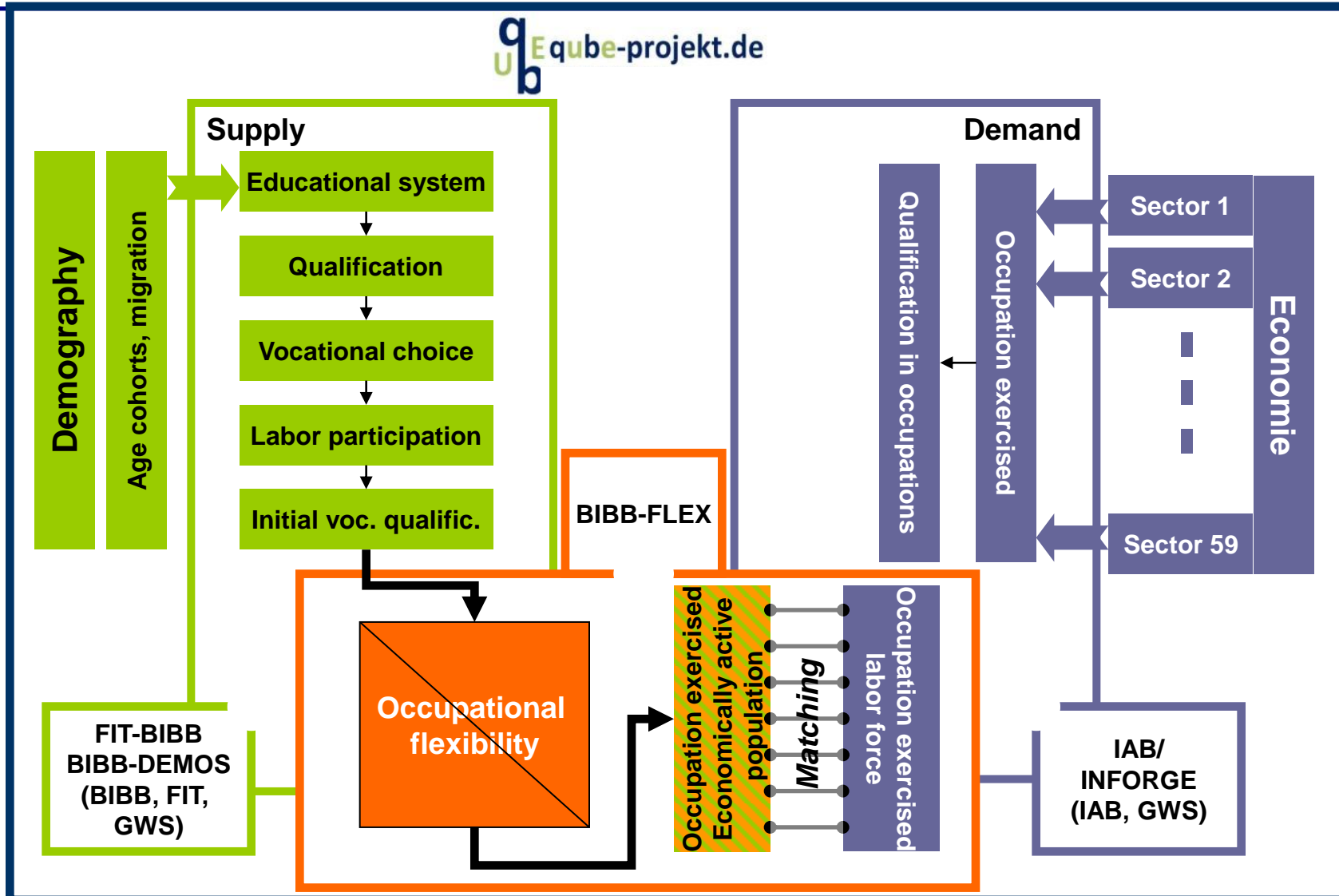
1. BIBB-IAB model set-up - Instituts

- 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

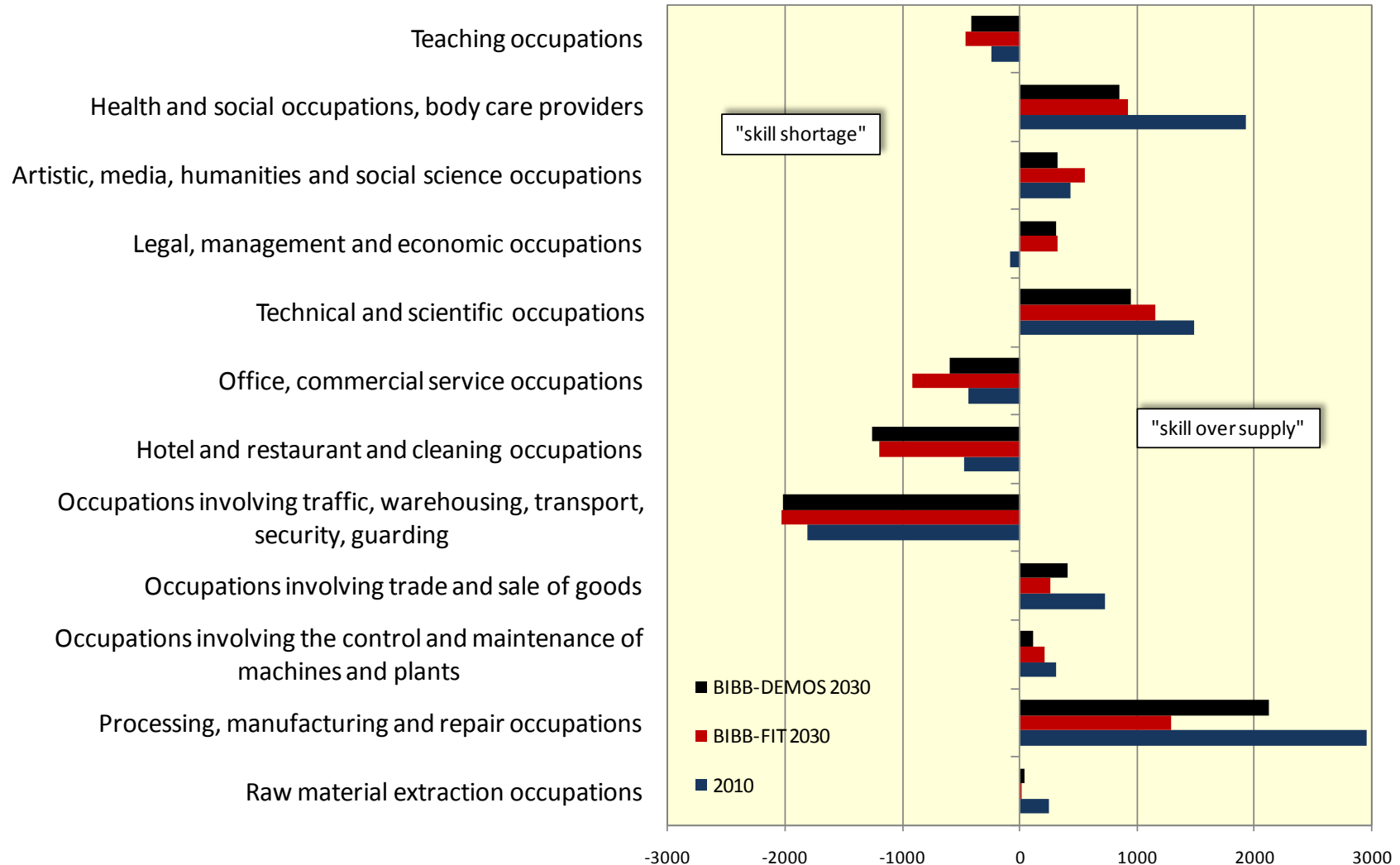
3 top-level Occupational Domains	12 Major Occupational Fields (main focus of activity microcensus)	54 Occupational Fields	Main focuses of activity microcensus
Production-related occupations Occupational fields: 1-13, 15, 17, 18, 20, 42	Raw material extraction occupations (2)	1, 2	Harvesting (2), supplying (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	

1. BIBB-IAB model set-up - Overview



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

In 000s



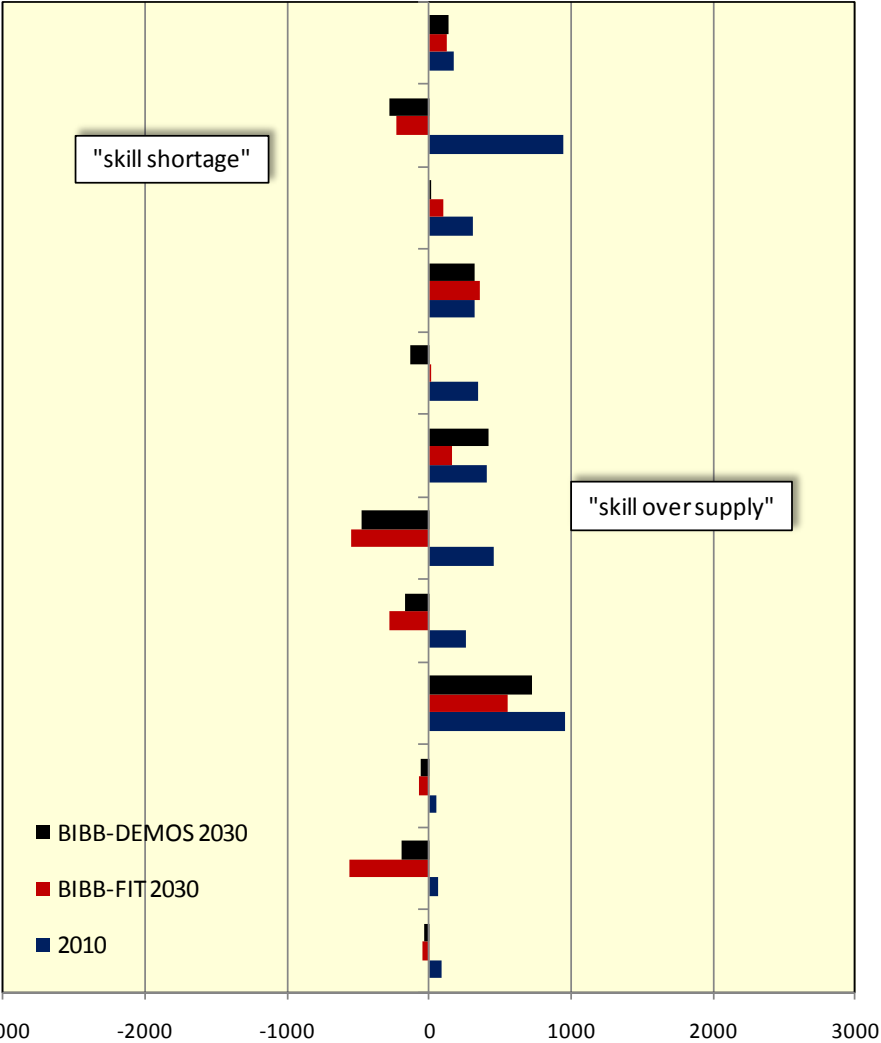
2. Results of occupational field projections – Flexibilities from Microcensus 2005(-2008)

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	Σ 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%

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

In 000s

- Teaching occupations
- Health and social occupations, body care providers
- Artistic, media, humanities and social science occupations
- Legal, management and economic occupations
- Technical and scientific occupations
- Office, commercial service occupations
- Hotel and restaurant and cleaning occupations
- Occupations involving traffic, warehousing, transport, security, guarding
- Occupations involving trade and sale of goods
- Occupations involving the control and maintenance of machines and plants
- Processing, manufacturing and repair occupations
- Raw material extraction occupations



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

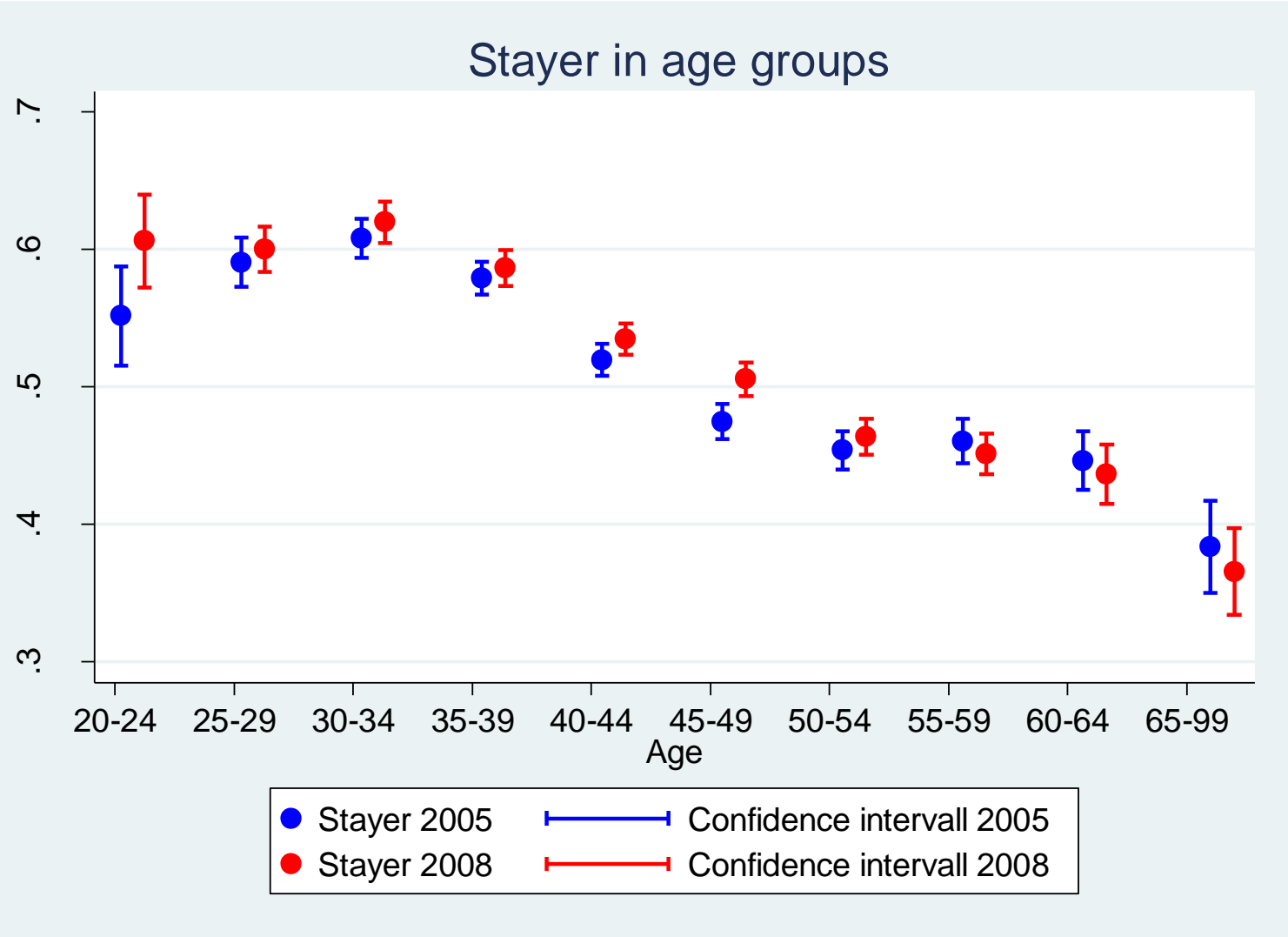
- At the current state of the project the flexibility matrix is used statically.

- 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

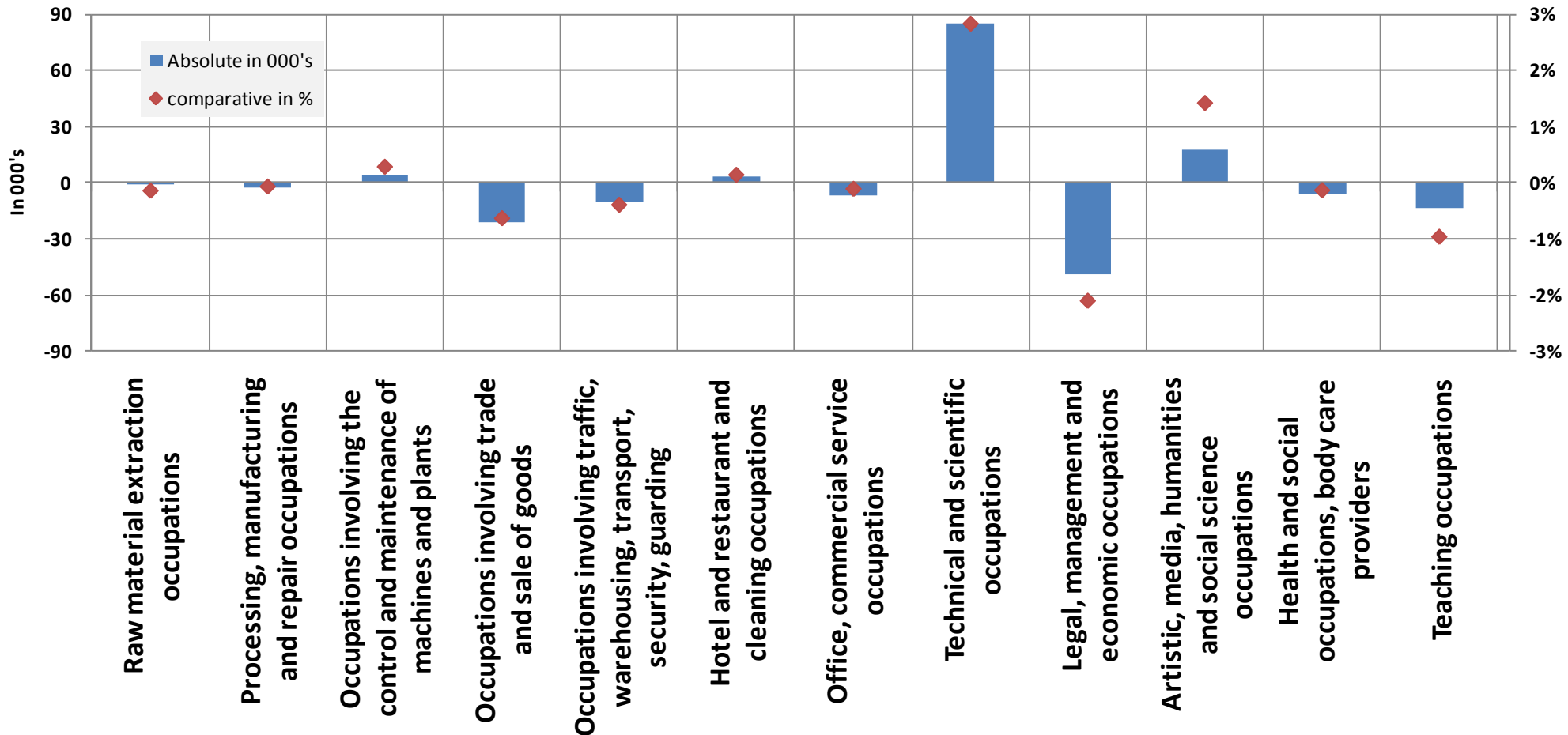


Source: German Microcensus 2005-2008; own calculations

5. Different assumptions of mobility behavior

E.g. Technical scientific occupations

➤ 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)



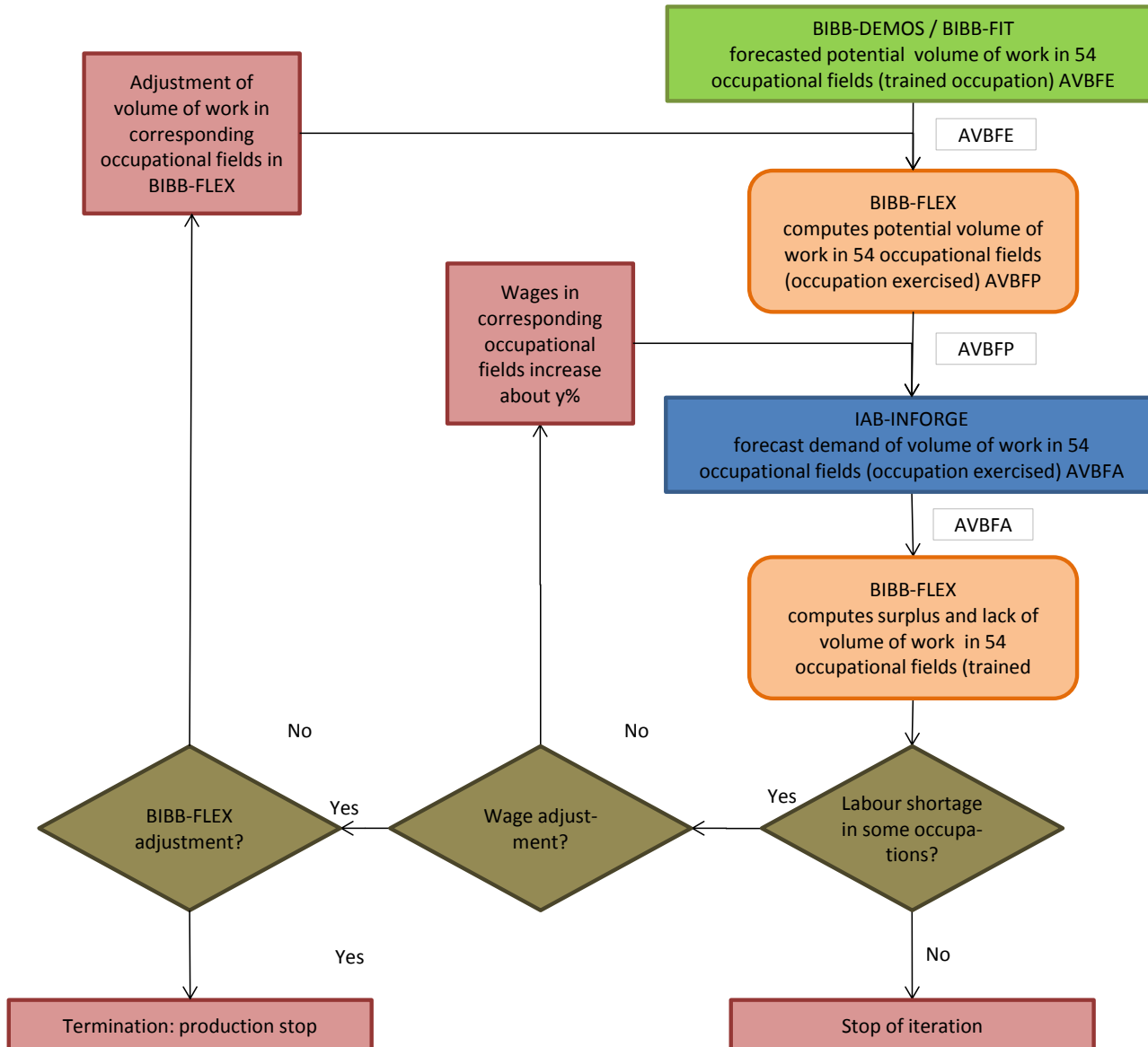
6. Challenges of the concept

- 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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