Bundesinstitut für Berufsbildung BIBB

Forschen
Beraten
Zukunft gestalten

Institut für Arbeitsmarkt- und Berufsforschung

Die Forschungseinrichtung der Bundesagentur für Arbeit

IAB

METHODS AND RESULTS OF SKILLS DEMAND AND SUPPLY FORECASTING – THE CASE OF GERMANY

Tobias Maier

Thessaloniki, 17.02.2011

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)

Summary of structure

1. BIBB-IAB model set-up (construction)
2. Results by skill level and occupational fields
3. Differences and common trends between Cedefop- and BIBB-IAB-forecasts
4. Future development and mutual exchange

1. BIBB-IAB model set-up

Project participants and distribution of tasks:

- **BIBB**: data generation, taxonomy (occupational fields, initial vocational qualification)
- **IAB**: demand projection [IAB/INFORGE-model (integral element of the GINFORS global model of GWS)]
- **GWS/BIBB**: Supply projection 1 (BIBB-DEMOS model)
- **FIT**: Supply projection 2 (FIT model)
- **BIBB**: Occupational flexibility matrix

Objectives:

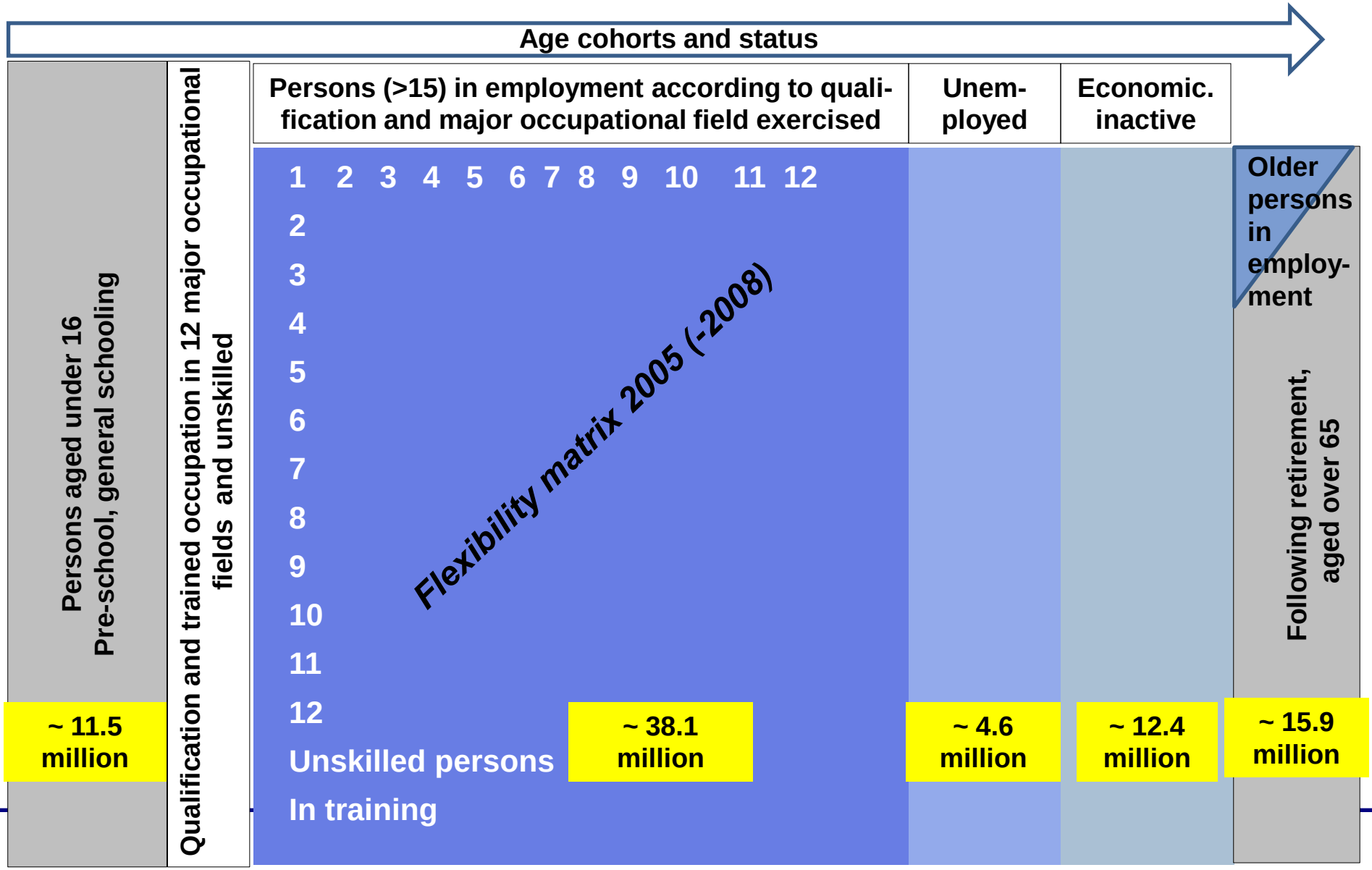
- Identify possible medium-term to long-term developments (up to 2025)
- Identify potential future problem areas in accordance with qualifications and occupations (***new***)
- Provide a balance of supply and demand (***new***)
- Provision of a basic model with uniform:
  - data foundations
  - classifications
- Deeper level of disaggregation than in previous comparable studies
- A well-founded empirical basis and transparency (providing an impetus for further statistical developments)

Components of the projection:

	Demand side (IAB) Realised demand	Occupational fields 12 MOF, 54 OF	Supply side (BIBB) Potential study
Data bases	MC → NA level	BIBB-BAuA Microcensus	MC → NA level Population forecasts
Level of aggregation	59 economic sectors 4 skill levels (ISCED) Occupation exercised		4 skill levels (ISCED) Initial vocational qualification by specialisation recoded from MC 05, (06-08)
Level of analysis	Per capita Stock variables; No flow variables		Per capita Stock New labour force supply Gender Age
Projection models	IAB-INFORGE (GWS)		BIBB-Demos (GWS) BIBB-FIT model
Results	Realised demand 2010-2025	Flexibility from trained occupation to occupation exercised (from above) MC 05 (06-08)	Economically active population 2010-2025

Source: Helmrich, Robert; Zika, Gerd (2010): Beruf und Qualifikation in der Zukunft. In: Helmrich, Robert; Zika, Gerd (Ed.): Beruf und Qualifikation in der Zukunft. Bonn 2010

Cross-sectional analysis of the population according to relevance for the labour market



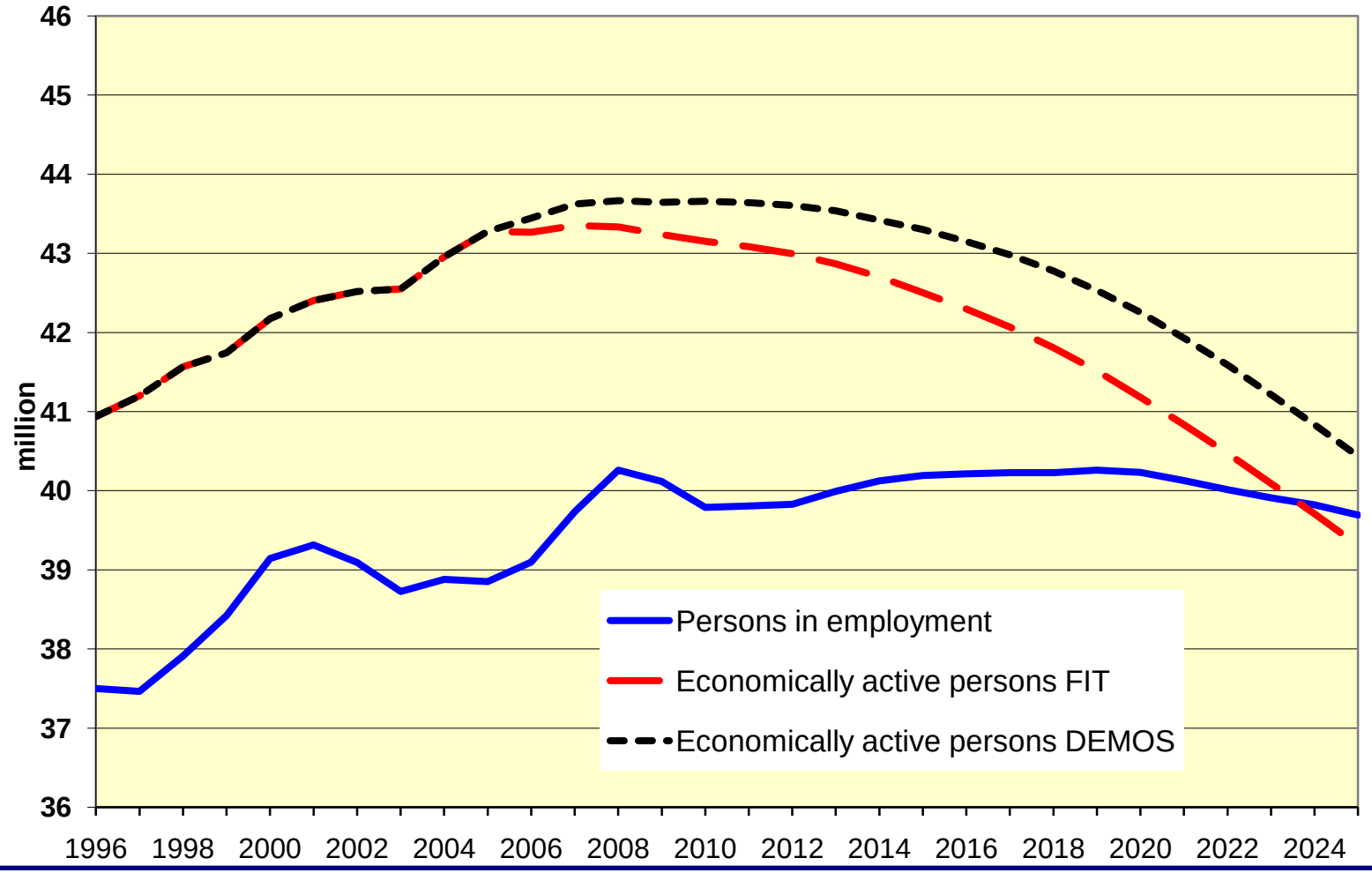
Factors influencing the projection

- Supply:
  - Demographic development
  - Educational participation
  - Participation in employment

- Demand:
  - Economic structural change
  - Globalisation, growth
  - Technological change

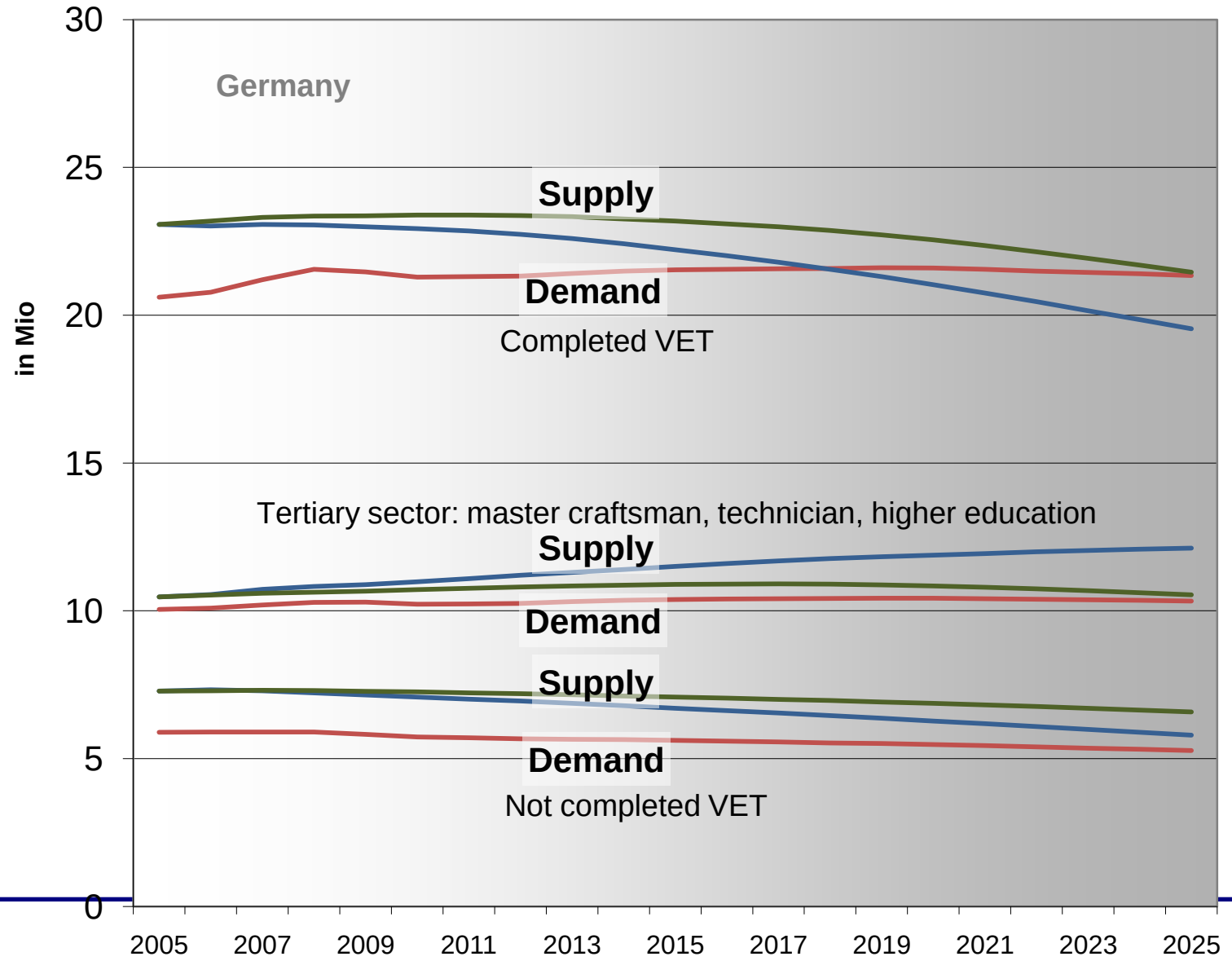
2. Results by skill level and occupational fields

Demand and supply of labour – total



Source: Helmrich, Robert; Zika, Gerd (2010): Beruf und Qualifikation in der Zukunft. In: Helmrich, Robert; Zika, Gerd (Ed.): Beruf und Qualifikation in der Zukunft. Bonn 2010

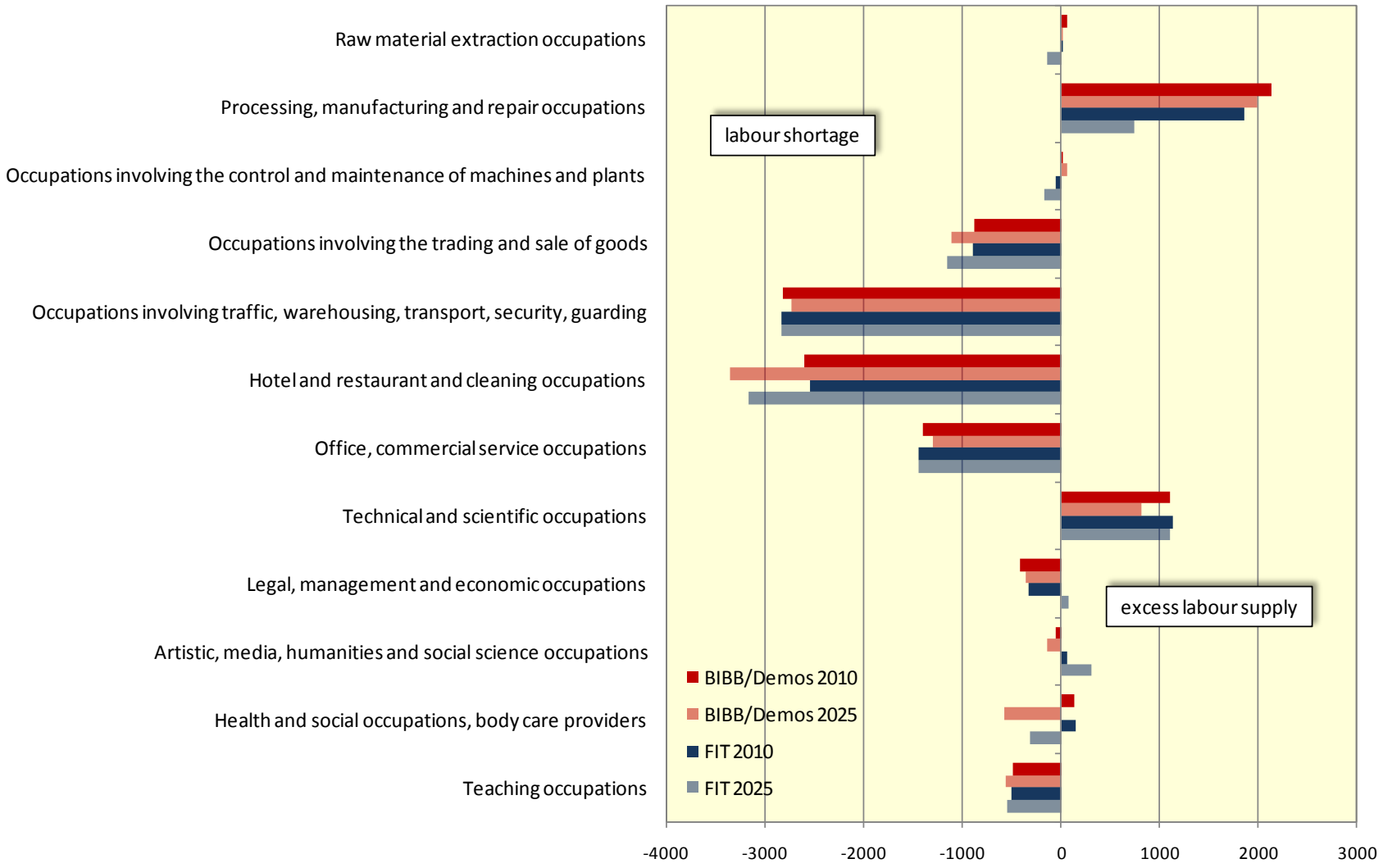
3a. Results of the qualification projections



- If the status quo persists, the low skilled (ISCED 1, 2 & 3a) will continue to be affected by high under-employment.
- As far as the medium skills level (ISCED 3b and 4) is concerned, the results indicate that there will be a future shortage of labour occurring
  - between 2015 and 2020 (BIBB-FIT projection) or
  - towards the end of the project period (BIBB-DEMOS projection).
- With regard to the highly skilled (ISCED 5 and 6), the results vary between an extremely tight labour market (BIBB-DEMOS projection) all the way to an over-supply of highly skilled workers (FIT projection).

2b. Results of occupational field projections

Supply and demand (trained occupation only)

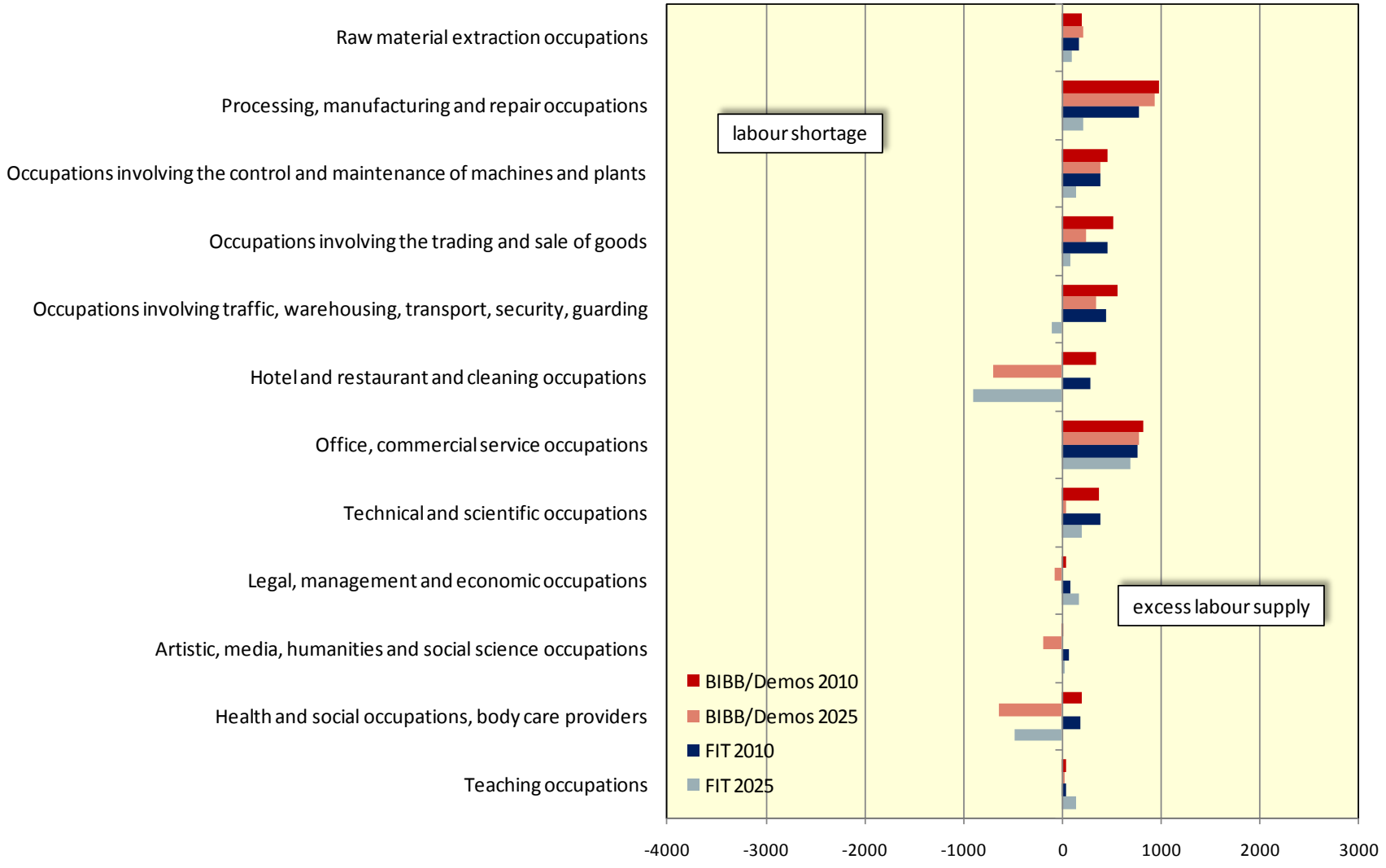


Calculations of flexibilities from Microcensus 2005

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 the trading 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

Supply and demand (incl. occupational flexibility)



3. Differences and common trends between Cedefop- and BIBB-IAB-forecasts

- Similiar data sources (Microcensus and Labour Force Survey, National Accounts)

- Different occupation categories
- Differences in categorisation of qualification:
  - Cedefop:

    3 qualification categories (ISCED 0-2, ISCED 3-4, ISCED 5-6)

  - BIBB-IAB:

    4 qualification categories (ISCED 0-3a, ISCED 3b-4, ISCED 5a+6, ISCED 5b)

Labour force (15+) and total job openings Germany (2000-20)

Labour force (15+)							
All qualification							
Germany	Levels (000s)			Change (000s)		Change (%)	
	2000	2010	2020	2000-10	2010-20	2000-10	2010-20
Cedefop	39447	41458	40815	2011	-643	5.1%	-1.6%
BIBB-DEMOS	42175	43658	42254	1483	-1404	3.5%	-3.2%
BIBB-FIT	42175	43152	41180	977	-1972	2.3%	-4.6%
Total job openings							
All qualification							
Germany	Levels (000s)			Change (000s)		Change (%)	
	2000	2010	2020	2000-10	2010-20	2000-10	2010-20
Cedefop	39144	39619	39992	475	373	1.2%	0.9%
IAB-INFORGE	39144	39788	40230	644	442	1.6%	1.1%

Labour force (15+) and total job openings Germany (2000-20)

Labour force (15+)							
High qualification							
	Levels (000s)			Change (000s)		Change (%)	
	2000	2010	2020	2000-10	2010-20	2000-10	2010-20
Cedefop	9663	10287	10960	624	673	6.5%	6.5%
BIBB-DEMOS	9952	10716	10845	764	129	7.7%	1.2%
BIBB-FIT	9952	10981	11879	1029	898	10.3%	8.2%
Total job openings							
High qualification							
	Levels (000s)			Change (000s)		Change (%)	
	2000	2010	2020	2000-10	2010-20	2000-10	2010-20
Cedefop	9928	10330	11116	402	786	4.0%	7.6%
IAB-INFORGE	9452	10222	10429	770	207	8.1%	2.0%

4. Evaluation of the concept and future prospects

Current limitations:

- Balancing in the form of model calculations – not a closed model but comprising harmonised assumptions (basic scenario)
  - for this reason, no internal model balancing processes on the labour market
  - no dynamisation of the flexibility process
  - only heads, no volume analysis

Thank you very much for your attention!

Contact details:
Tobias Maier
Federal Institute for Vocational Education and Training
Robert Schuman-Platz 3
53175 Bonn
tobias.maier (at) bibb.de
+49 228 107 2043