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Forecasting skill supply and demand in Europe: Year 2

SKILLSNET TECHNICAL WORKSHOP
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Researchcentrum voor Onderwijs
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Research Centre for Education
and the Labour Market

WARWICK INSTITUTE *for*
EMPLOYMENT RESEARCH





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Task 12: International comparisons of changing skill structures and projections

Martin Lepič

**Forecasting skill supply and demand in Europe: exploring
alternative scenarios and developing better tools,
Thessaloniki, 14-15 June 2010**

Main points

- 1. Key tasks**
- 2. Main sources**
- 3. Classification used**
- 4. Countries covered in projections**
- 5. Factors affecting employment**
- 6. Example of outputs**

Key tasks

- To compare methods and approaches adopted in the development of employment structures recognized in recent available forecasts
- To analyse the main trends in sectoral and occupational development of selected countries in and outside Europe

Sources

- CEDEFOP projection
- PROGNOS AG projection
- BLS projection

CEDEFOP projection

- Well known to all



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Prognos AG



- www.prognos.com
- Founded in 1959 in Basel
- The Prognos World Reports have published annually since 1971
- Detailed demographic and economic forecasts for 26 European and 4 non-European countries



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Prognos AG projection

- The forecast model is based on a top-down approach
- The trend extrapolations for the individual countries are interdependent and converge in the long run.
- The extrapolation of the labour force takes into account results that were specified in the demographic section.
- Employment by industry is calculated as a quotient of gross value added and productivity.

BLS projection

- U.S. Bureau of Labor Statistics (www.bls.gov)
- Every second year – the last one in November 2009 (for years 2008-2018)
- Projections of industrial and occupational employment are developed in a series of **six** interrelated steps, each of which is based on a different procedure or model and related assumptions
- The results produced by each step are key inputs to following steps, and the sequence may be repeated multiple times to allow feedback and to ensure consistency.



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BLS projection – 6 steps

- Labour force (demography projection)
- Aggregate economy
- Final demand (GDP) by consuming sector and product
- Industry output
- Industry employment
- Employment by occupation

Classification

	CEDEFOP projection	PROGNOS projection	BLS projection
Industry			
Occupation			

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Classification

	CEDEFOP projection	PROGNOS projection	BLS projection
Industry	41 groups (NACE 1.1)		
Occupation	27 groups (ISCO88 - 2D level)		

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Classification

	CEDEFOP projection	PROGNOS projection	BLS projection
Industry	41 groups (NACE 1.1)	28 groups (NACE 1.1)	
Occupation	27 groups (ISCO88 - 2D level)	NO	

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Classification

	CEDEFOP projection	PROGNOS projection	BLS projection
Industry	41 groups (NACE 1.1)	28 groups (NACE 1.1)	cca 200 groups (NAICS)
Occupation	27 groups (ISCO88 - 2D level)	NO	cca 750 groups (SOC)

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Creating of correspondence tables

- **NAICS → NACE (Rev. 1) 2 digit**
- The correspondence table cannot be applied for about 7 % of workers
- **SOC → ISCO-88 3 digit**
- It is not possible to separate skilled and unskilled workers in the Agriculture sector. All these workers are classified in the group ISCO 600 whereas the **group ISCO 920 is empty**
- No data about the Armed Forces (ISCO 0)

Final Sectoral Classification

- | | |
|---|---|
| 01 Agriculture, Forestry and Fishing (NACE 01-05) | 14 Manufacturing n.e.c. (NACE 36-37) |
| 02 Mining and Quarrying (NACE 10-14) | 15 Electricity, Gas and Water (NACE 40-41) |
| 03 Food, Beverages and Tobacco (NACE 15-16) | 16 Construction (NACE 45) |
| 04 Textiles, Wearing Apparel and Leather (NACE 17-19) | 17 Wholesale, Retail Trade and Repair (NACE 50-52) |
| 05 Wood, Paper and Printing & Publishing (NACE 20-22) | 18 Hotels and Restaurants (NACE 55) |
| 06 Coke, Petroleum, Nuclear Fuel (NACE 23) | 19 Transport and Communication (NACE 60-64) |
| 07 Chemicals (NACE 24) | 20 Financial Intermediation (NACE 65-67) |
| 08 Rubber and Plastic Products (NACE 25) | 21 Real Estate, Business Services (NACE 70-74) |
| 09 Non Metallic Mineral Product (NACE 26) | 22 Public Authorities (NACE 75) |
| 10 Basic Metals, Metal Products (NACE 27-28) | 23 Education (NACE 80) |
| 11 Machinery Equipment (NACE 29) | 24 Health and Social Work (NACE 85) |
| 12 Electrical Equipment (NACE 30-33) | 25 Social and Personal Services and Private Households (NACE 90-99) |
| 13 Transport Equipment (NACE 34-35) | |



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Final Occupational Classification

- | | |
|--|---|
| 01 Legislators and senior officials (ISCO 11) | 14 Personal and protective services workers (ISCO 51) |
| 02 Corporate managers (ISCO 12) | 15 Models salespersons and demonstrators (ISCO 52) |
| 03 Managers of small enterprises (ISCO 13) | 16 Skilled agricultural and fishery workers (ISCO 61) |
| 04 Physical mathematical and engineering science professionals (ISCO 21) | 17 Extraction and building trades workers (ISCO 71) |
| 05 Life science and health professionals (ISCO 22) | 18 Metal machinery and related trades workers (ISCO 72) |
| 06 Teaching professionals (ISCO 23) | 19 Precision handicraft craft printing and related trades workers (ISCO 73) |
| 07 Other professionals (ISCO 24) | 20 Other craft and related trades workers (ISCO 74) |
| 08 Physical and engineering science associate professionals (ISCO 31) | 21 Stationary plant and related operators (ISCO 81) |
| 09 Life science and health associate professionals (ISCO 32) | 22 Machine operators and assemblers (ISCO 82) |
| 10 Teaching associate professionals (ISCO 33) | 23 Drivers and mobile plant operators (ISCO 83) |
| 11 Other associate professionals (ISCO 34) | 24 Sales and services elementary occupations (ISCO 91) |
| 12 Office clerks (ISCO 41) | 25 Agricultural fishery and related labourers (ISCO 92) |
| 13 Customer services clerks (ISCO 42) | 26 Labourers in mining construction manufacturing and transport (ISCO 93) |



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Countries covered in projections

	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK	CH	NO
CEDEFOP projection	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PROGNOS projection	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X	X
BLS projection																													

	EU24	EU26	EU27	EU29	USA	CA	JP	KO
CEDEFOP projection	X	X	X	X				
PROGNOS projection	X	X			X	X	X	X
BLS projection					X			
	EU27 without CY, LU and MT	EU24 + CH + NO		EU27 + CH + NO			Some manufacturing industries are not in detail	Some manufacturing industries are not in detail

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Factors affecting employment – CEDEFOP, Prognos and BLS

- Final consumption expenditure by government
- Final consumption expenditure by households
- Gross fixed capital formation
- Intermediate Demand
- Labour productivity
- Imports
- Exports
- Value Added

Factors affecting employment - BLS

NAICS code	Sector title	Factors affecting output and employment
11100	Crop production	Output is expected to grow more slowly than GDP. Employment is projected to decrease slightly as productivity rises modestly, immigration enforcement continues, and fewer people farm as their primary job.
81110	Automotive repair and maintenance	Output is consumed primarily by individuals and is projected to increase slightly with the number of older cars and trucks on the road that will be in need of maintenance. Productivity is expected to grow modestly with increasing familiarity of embedded electrical components and computer systems within new cars that make diagnosis of problems easier. Employment is expected to be nearly flat as output increases are achieved through improvements in productivity.

SOC code	Occupation title	NAICS code	Sector title	Factors affecting occupational utilization
21-1022	Medical and public health social workers	62321	Residential mental retardation facilities	A small increase is expected as more of these workers are needed to assist the elderly and the disabled and their families.
		62330	Community care facilities for the elderly	A small decrease is expected as demand for services provided by these workers grows more slowly than demand for direct care services to the elderly, like home care.
		62412	Services for the elderly and persons with disabilities	A small increase is expected as more of these workers will be necessary to assist the elderly in locating services.

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Factors affecting employment - BLS

ISCO 112	A small increase is expected as the number of threats, for which these workers must prepare, increases .
ISCO 233	A small increase is expected as these workers are preferred over child care workers with less training.
ISCO 315	A small increase is expected as increasing security regulations lead to greater demand for this occupation.
ISCO 513	A moderate increase is expected as individuals prefer to stay in their homes rather than to move to residential care facilities.
ISCO 742	A small decrease is expected as fewer furniture stores offer services performed by these workers.
ISCO 834	A small increase is expected as water transportation becomes cheaper relative to other modes of transportation.
ISCO 932	A small decrease is expected as increased automation in factories should reduce the need for these workers.



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Example of outputs

Sectors with the largest employment growth	EU29	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HU	CH	IE	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK	Total
24 Health and Social Work (85)	9	5	8	1	5	10	6	8	3	8	6	10	10		9	9	9	8	2	8	10	9	10	7	6	7	8	10	10	8	219
21 Real Estate, Business Services (70-74)	10	10	10	10	9	9	7	10	6	6			6	10	10	8	10	10	6	10		10	8	10	4	9			8	10	216
25 Social and Personal Services (90-99)	8	3	7	7	10		10		4	9	7	9	9	6	8	7	4	4	5			5	7				9		9	9	156
18 Hotels and Restaurants (55)	7	8		3	4	4	8		8	10	9	4	8			4	8		9	7	7	8		5	7	5	3			7	143
17 Wholesale, Retail Trade; Rep (50-52)	6			9	8					7	10	5				10		9	10		9		9	9	10	10			3	6	130
19 Transport and Communication (60-64)	2		9	8	3	8		7	10	4				8	3				3		8			8	1	8	7		7	5	109
23 Education (80)	5	4			7	7	9	9	7	5	5			7		6	3		7			7					5	9	6		108
16 Construction (45)		9	6	4	6							8		9	1						6			6	5	4			4		68
14 Manufacturing n.e.c. (36-37)	3					3	5		5						6		6			9			4		9		4	8			62
22 Public Authorities (75)		7	5	5	2			6			8					5											10				48
20 Financial Intermediation (65-67)				2		5	3		2			7						2	8				6			3			1		39
12 Electrical Equipment (30-33)		2				6			9		1	1			7		5													2	33
07 Chemicals (24)	4	6						3		1	3					2	7								2		1				29
13 Transport Equipment (34-35)										3						1	2	5				6	5			1	6				29
05 Wood, Paper, Printing & Publish. (20-22)							4							4			7							3				5	3		26
09 Non Metallic Mineral Product (26)							1	2					7				3						2		8						23
10 Basic Metals, Metal Products (27-28)							2	1				2			5		6	4													20
03 Food, Beverages and Tobacco (15-16)								5	1							3										6	2		2		19
11 Machinery Equipment (29)			4				4					6																	4		18
15 Electricity, Gas and Water (40-41)				6						2	2		5										3								18
08 Rubber and Plastic Products (25)											4				2											2					8
06 Coke, Petroleum, Nuclear Fuel (23)													4				1														5
02 Mining and Quarrying (10-14)													3										1								4
04 Textiles, Wearing and Leather (17-19)												3																			3
01 Agriculture, Forestry and Fishing (01-05)																															0

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Example of outputs

	Rank	CEDEFOP		Prognos		BLS	
		Industry	Avg. Score	Industry	Avg. Score	Industry	
Industries with the largest employment growth	1	24 Health and Social Work (85)	7,30	21 Real Estate, Business Services (70-74)	7,65	21 Real Estate, Business Services (70-74)	
	2	21 Real Estate, Business Services (70-74)	7,20	24 Health and Social Work (85)	7,42	24 Health and Social Work (85)	
	3	25 Social and Personal Services and Private Households (90-99)	5,20	25 Social and Personal Services and Private Households (90-99)	5,81	23 Education (80)	
	4	18 Hotels and Restaurants (55)	4,77	17 Wholesale, Retail Trade; Rep (50-52)	5,50	16 Construction (45)	
	5	17 Wholesale, Retail Trade; Rep (50-52)	4,33	23 Education (80)	4,73	25 Social and Personal Services and Private Households (90-99)	
	6	19 Transport and Communication (60-64)	3,63	18 Hotels and Restaurants (55)	3,62	17 Wholesale, Retail Trade; Rep (50-52)	
	7	23 Education (80)	3,60	22 Public Authorities (75)	3,12	18 Hotels and Restaurants (55)	
	8	16 Construction (45)	2,27	19 Transport and Communication (60-64)	2,81	22 Public Authorities (75)	
	9	14 Manufacturing n.e.c. (36-37)	2,07	20 Financial Intermediation (65-67)	1,88	20 Financial Intermediation (65-67)	
	10	22 Public Authorities (75)	1,60	12 Electrical Equipment (30-33)	0,92	19 Transport and Communication (60-64)	

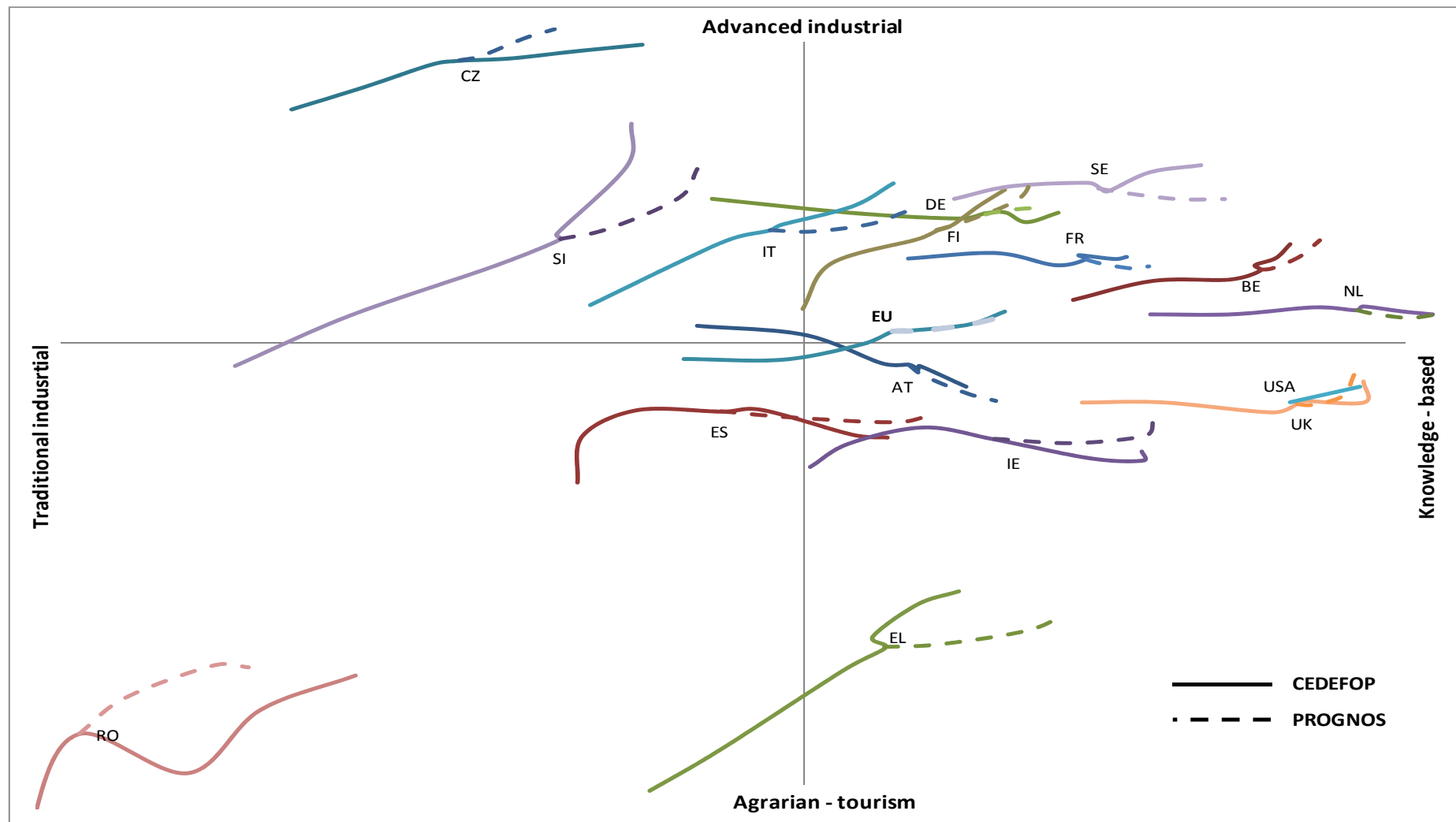
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Example of outputs

	EU		USA	
	Occupational group	Change	Occupational group	Change
Occupations with the largest employment growth	Other associate professionals (ISCO 34)	2 432	Personal and protective services workers (ISCO 51)	2 554
	Other professionals (ISCO 24)	1 835	Life science and health associate professionals (ISCO 32)	1 546
	Personal and protective services workers (ISCO 51)	1 450	Other professionals (ISCO 24)	1 314
	Corporate managers (ISCO 12)	777	Other associate professionals (ISCO 34)	1 241
	Sales and services elementary occupations (ISCO 91)	528	Teaching professionals (ISCO 23)	1 126
	Labourers in mining construction manufacturing and transport (ISCO 93)	421	Physical mathematical and engineering science professionals (ISCO 21)	903
	Teaching associate professionals (ISCO 33)	420	Office clerks (ISCO 41)	903
	Physical mathematical and engineering science professionals (ISCO 21)	317	Customer services clerks (ISCO 42)	817
	Customer services clerks (ISCO 42)	317	Managers of small enterprises (ISCO 13)	626
	Models salespersons and demonstrators (ISCO 52)	305	Sales and services elementary occupations (ISCO 91)	432

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Example of outputs



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Questions and answers

- Which factors have affected that sector *Construction (45)* is not in TOP 10 sectors with the largest employment growth in Prognos projection?
- Why occupational group *Life science and health associate professionals (ISCO 32)* is not in TOP 10 occupations with the largest employment growth in CEDEFOP projection?



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Thank you for your attention.

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