21 – 22 November 2017

International seminar, Bogota

Skills mismatch and anticipation of skills needs
Methodologies and experiences

Skills anticipation and matching. ILO tools and approaches.

Olga Strietska-Ilina

Senior Skills and Employability Specialist,
Employment Policy Department
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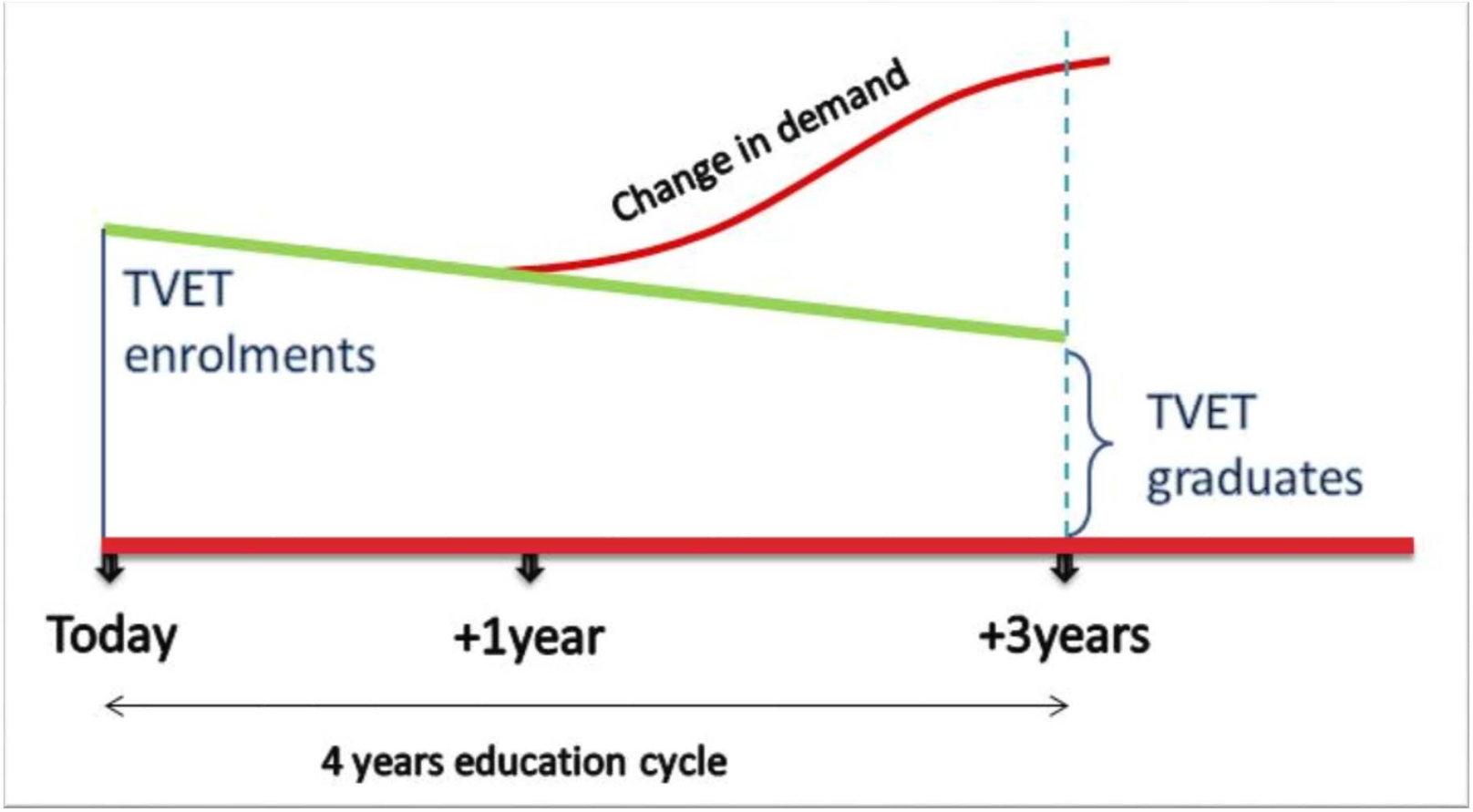
Global drivers of change and changing skill needs

- Technological change
- Globalisation and trade
- Demographic change
- Mobility of labour
- Change in work organisation
- Educational attainment
- Transition to environmental sustainbility and a low carbon ecnomy

Demand for skills is changing faster than training is delivered



Policy cycle

Skill needs assessment & anticipation

Skills development policy / Curriculum design / Competency standards

Skills development (delivery)

Monitoring of training relevance

Evaluation of training outcomes and their relevance to the labour market needs

Key ILO resources

- *'Members should… support and facilitate research on human resources development and training, which could include: … identifying, measuring and forecasting the trends in supply and demand for competencies and qualifications in the labour market…'*

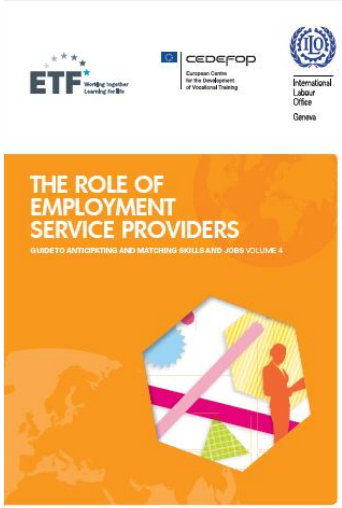
ILO Recommendation 195 on HRD, 2004

- *"A mismatch between skills demand and supply has high economic and social costs and results from and contributes to structural unemployment. Early identification of current and future skills needs is part of a forward-looking strategy that reduces skills gaps."*

Conclusions on skills for improved productivity, employment growth and development, ILC 2008

- *Anticipating future skills needs* is recognised as the first *building block of a robust training and skills strategies and policies*

ILO skills anticipation and matching tools: Inter-agency compendium



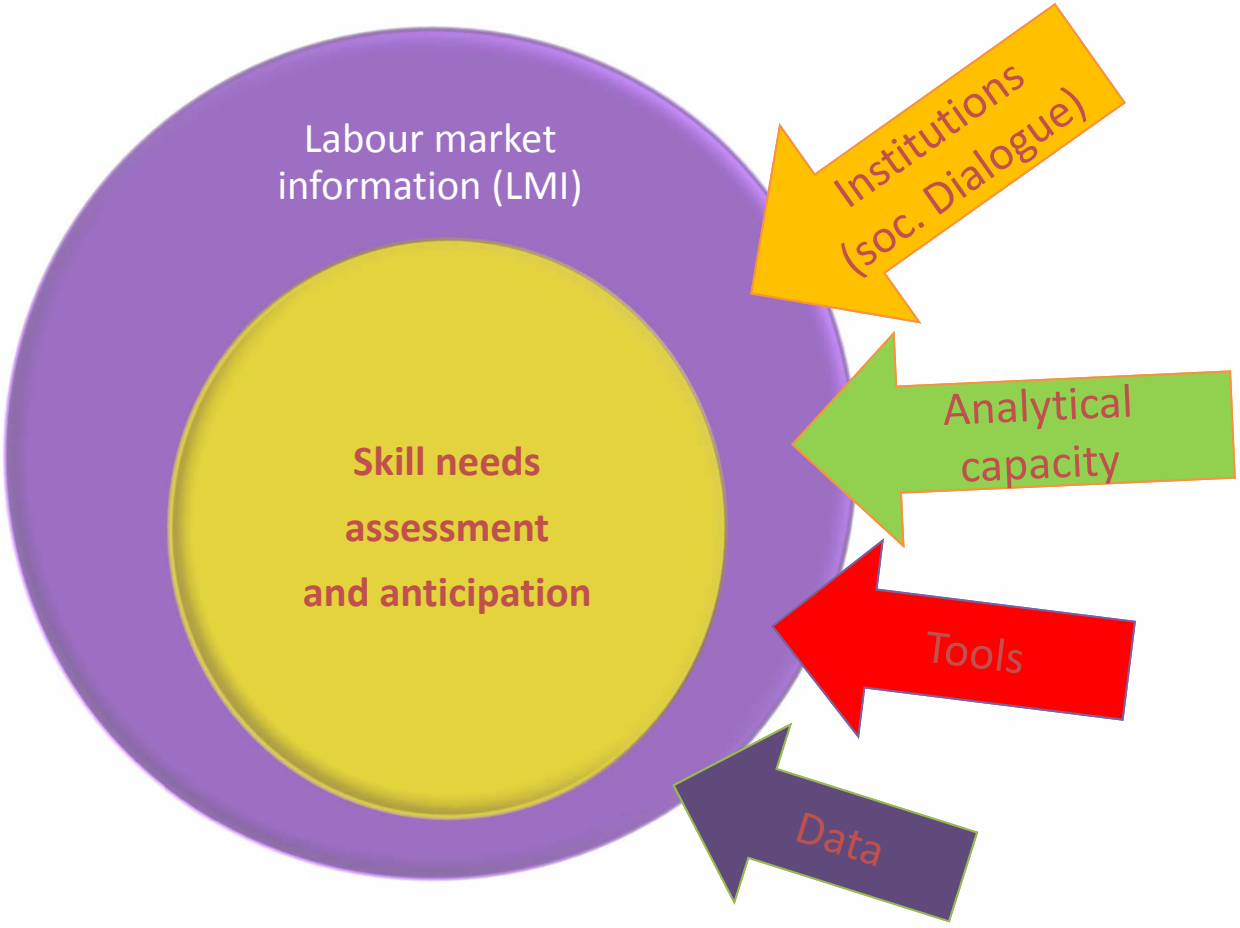
ILO skills anticipation and matching tools: Specific policy or driven

- Sectoral approaches
- Social dialogue
- Elements of foresight as a change management tool

Volume I:
USING LABOUR MARKET INFORMATION

Labour market information (LMI)

Any information concerning the size and composition of the labour market, the way it functions, its problems, opportunities and employment-related intentions of its actors.



Volume I:
USING LABOUR MARKET INFORMATION

- Explains skills measurement
- Defines minimum LMI requirements for evidence-based and informed decision making
- Deals with standard statistics rather than surveys
- Provides examples of key indicators of skills supply, demand and mismatch
- Indicates the usual sources and institutions reposnsible for the data collection, flow and analysis

How to measure a skill?

Testing a skill? (competencies)

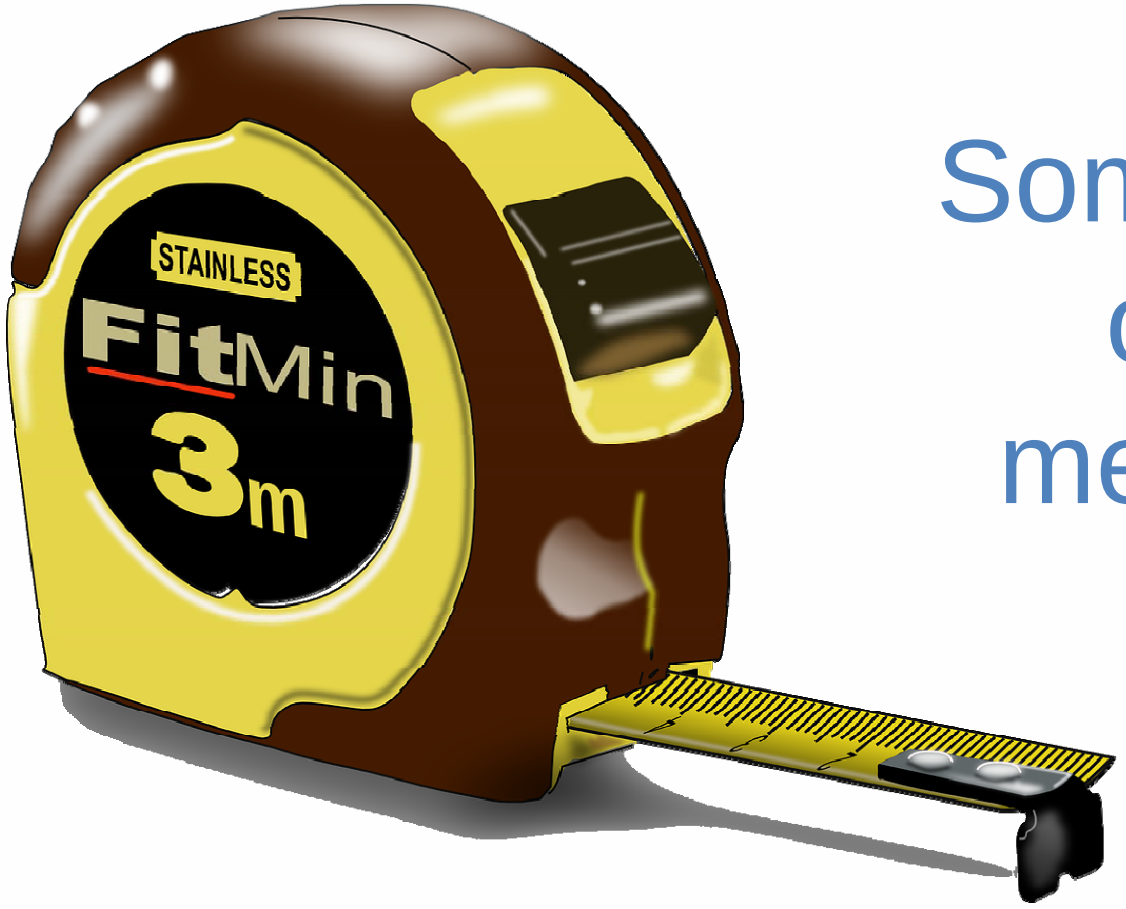
Proxies:

- Occupations
- Jobs / job tasks
- Qualifications
- Education / training type / subject / level
- Vacancies

Matrices

- E.g. Sector / occupation
- E.g. Sector / level of qualification

Measurement of supply



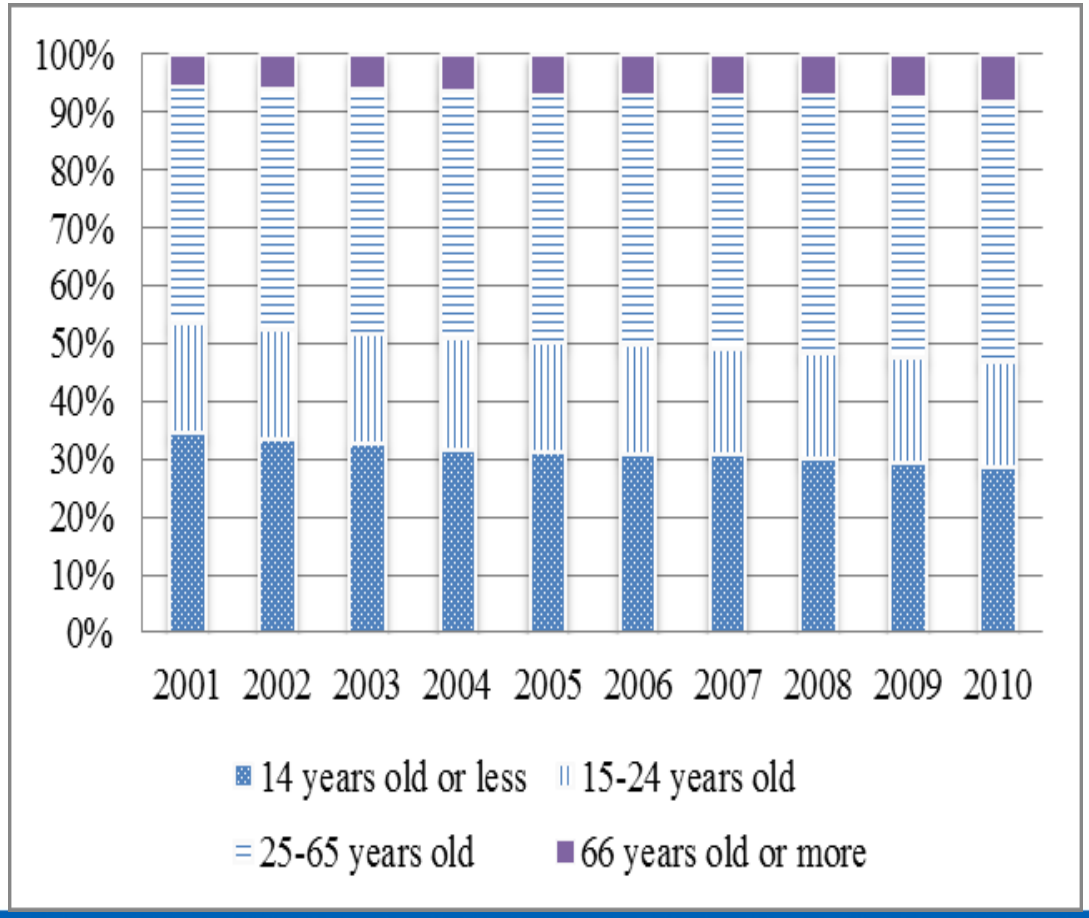
Some examples on supply measurement

Supply data and sources

- Demographic data and projections (sex, age groups) – national statistical offices (NSOs)
- Stock of labour force and its composition (LFS)
- Flows: enrolment, participation, graduation, drop out data by field and types of courses –formal education (admin data, MoE), (in)formal training courses (PES, MoL)
- Unemployment data and projections (MoL /PES, LFS)

Age structure of population

Age structure in Peru



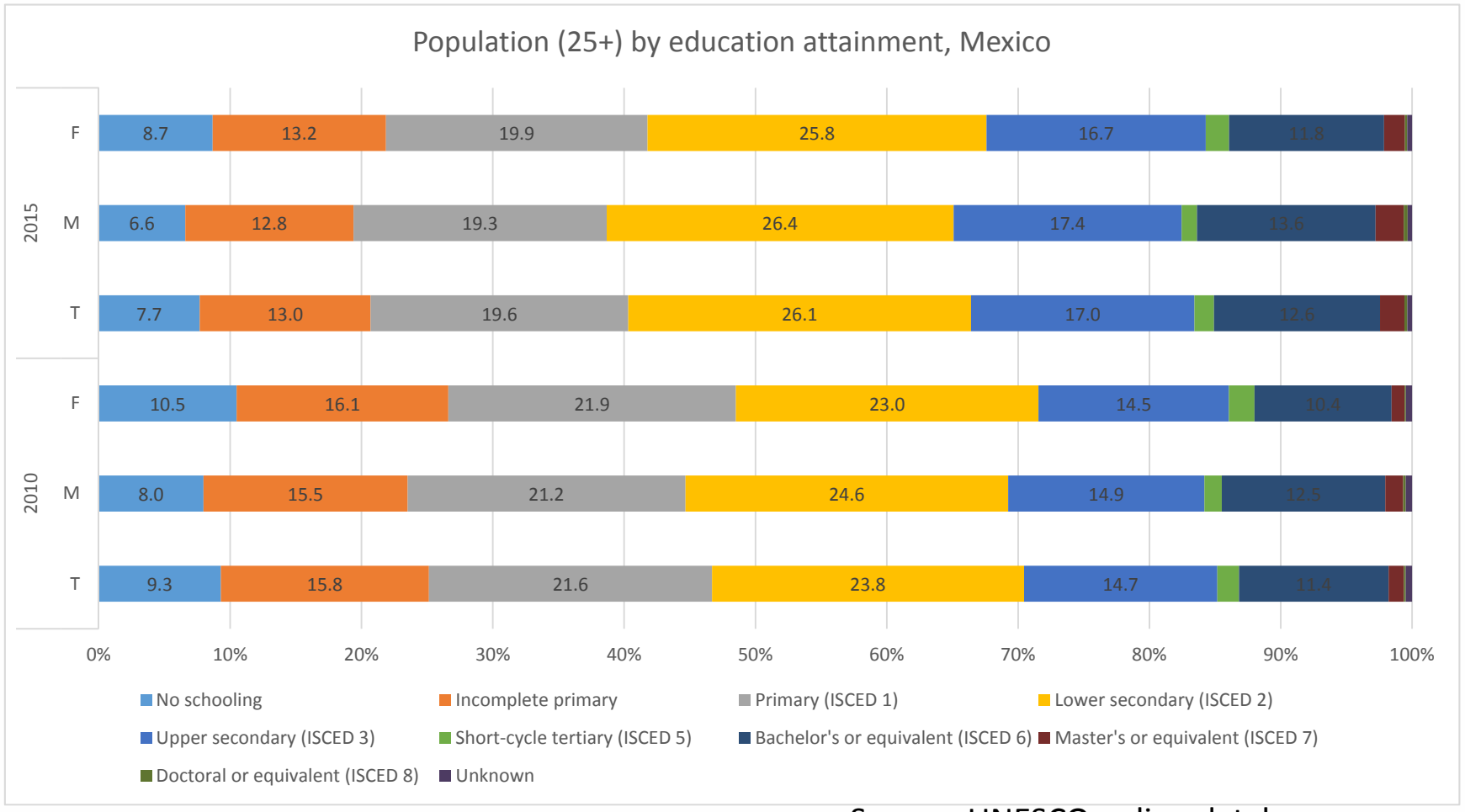
Data needed

- Demographic data (possibly projection) – population by age
- Time series

Strengths and weaknesses

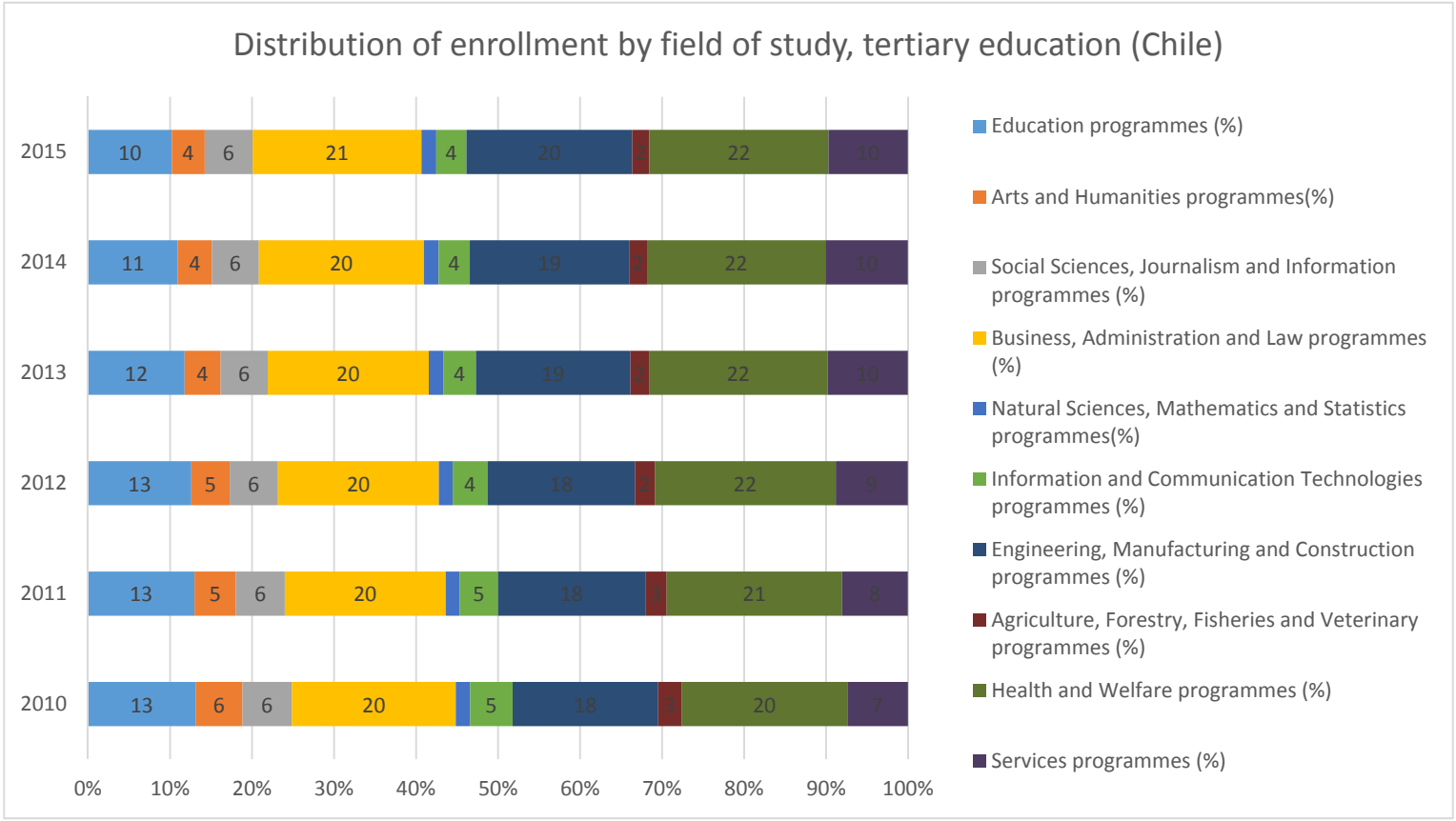
- No direct information on skills
- But an essential background information for further analysis – is the working age population growing or declining – oversupply or lack of labour can be expected?

Educational attainment – labour force flows



Source: UNESCO online database

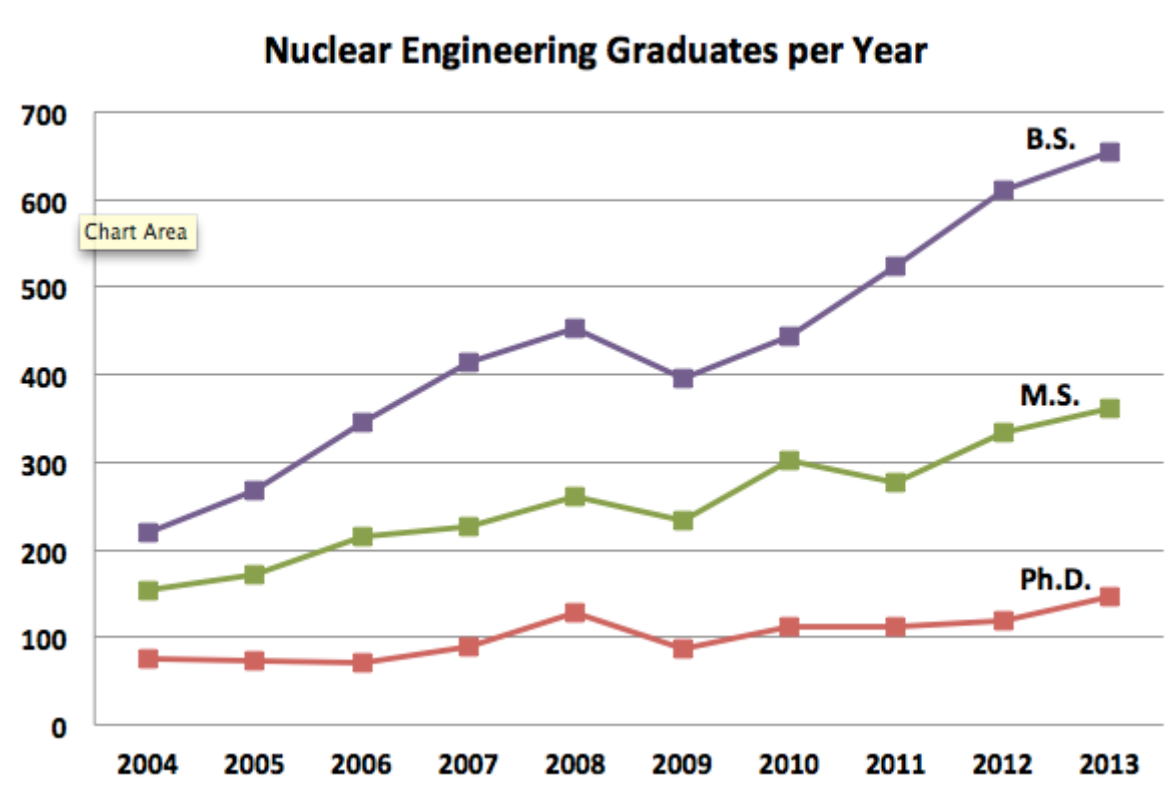
Flows – strucutre by field of education



Source: UNESCO online database

Structure of graduates

USA: Nuclear engineering graduates



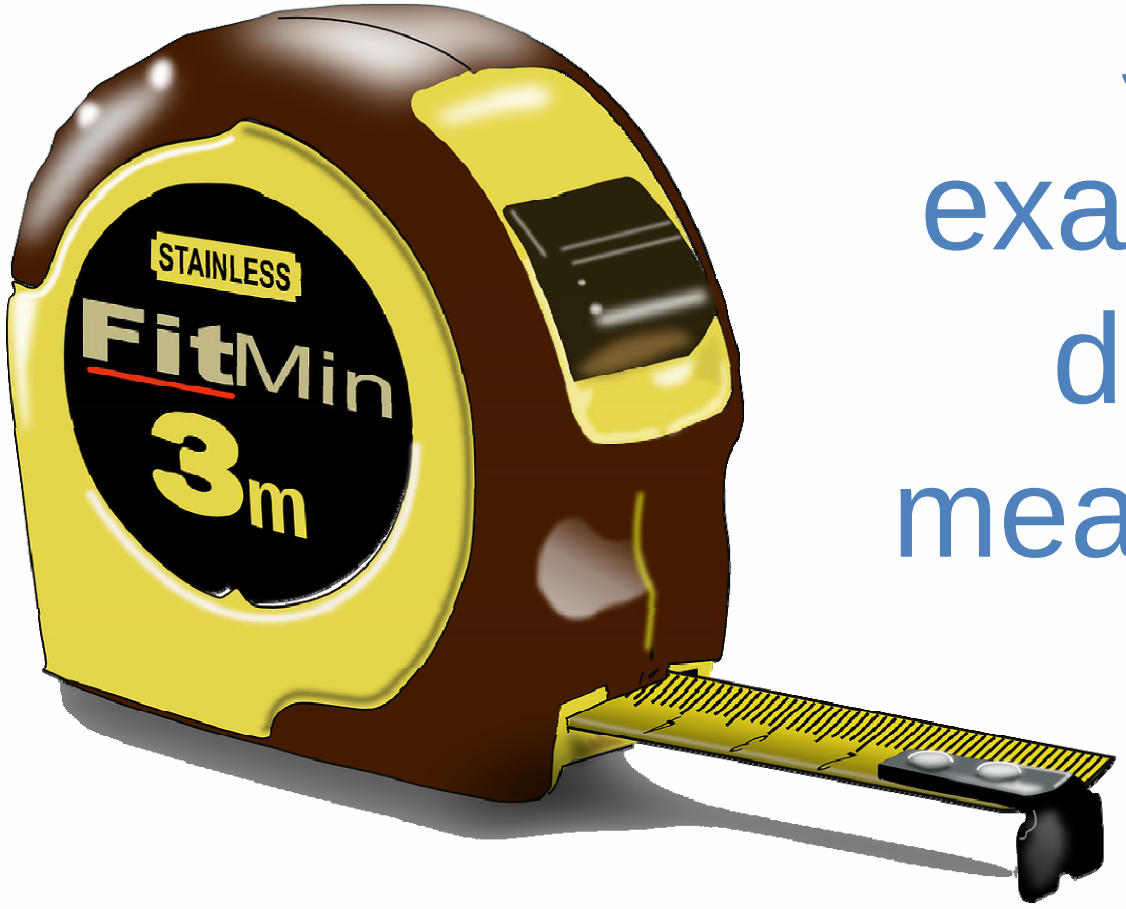
Data needed

- Administrative data from the education system

Strengths and weaknesses

- Without forecast of graduates it may be not enough to assess skills demand supply development
- Graduates may not go into the expected industry / sector

Measurement of demand

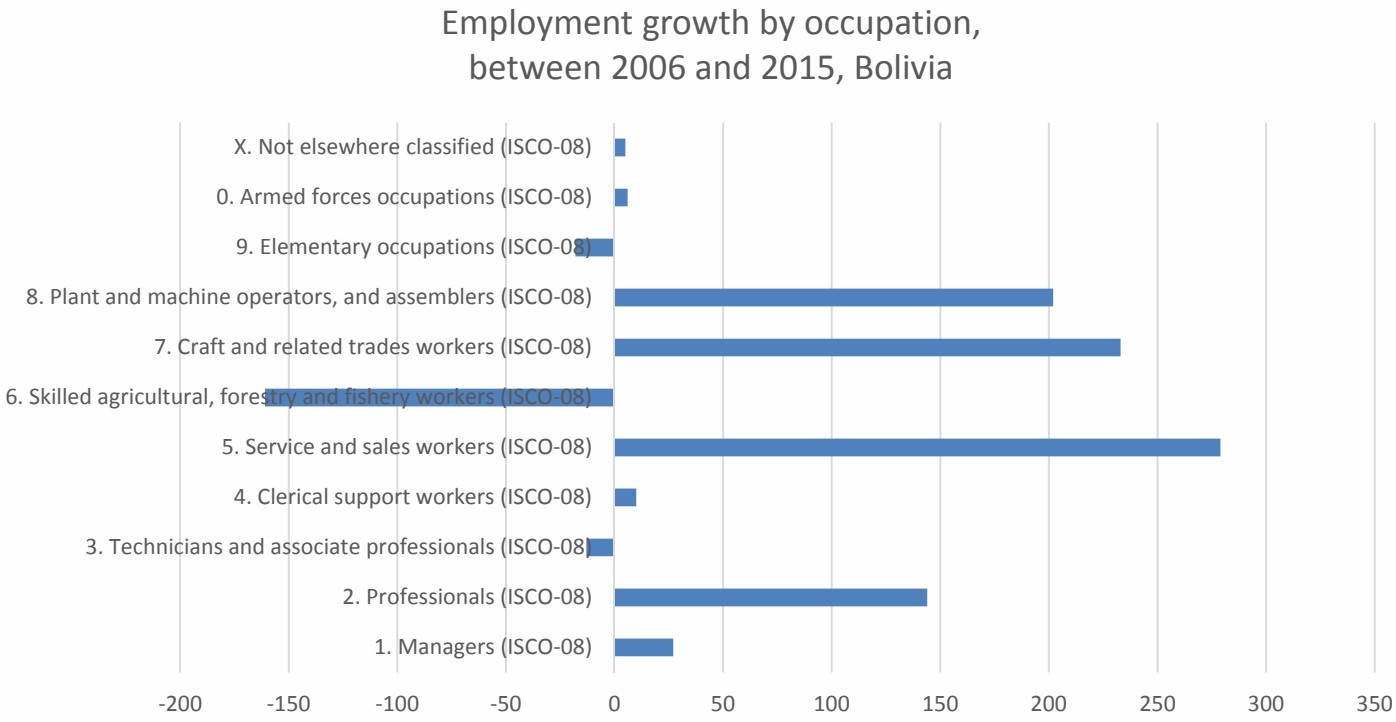


Some examples on demand measurement

Proxies for skills demand and data sources

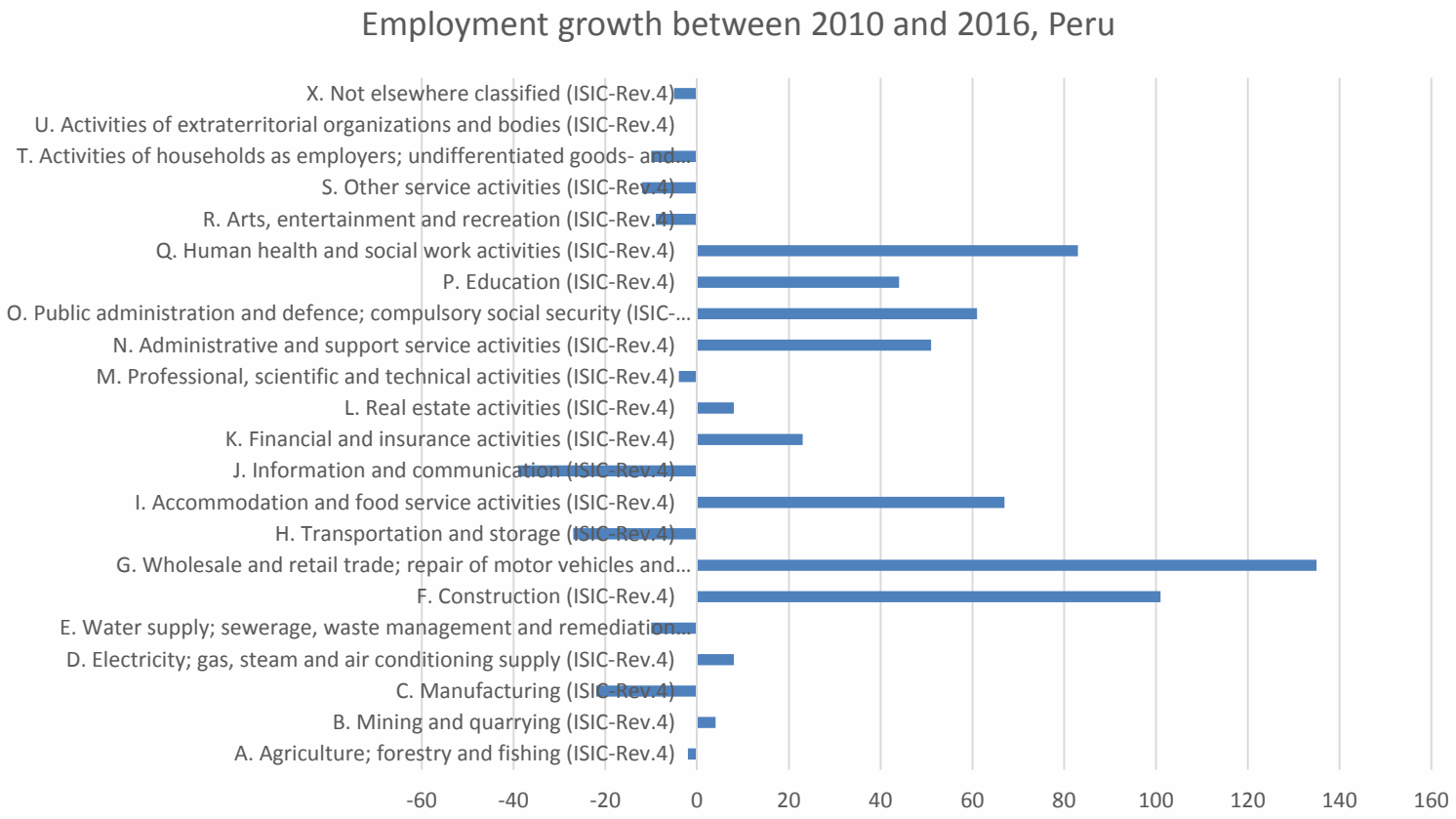
- Structure and composition of employment (LFS, PES)
- Employment growth (LFS, PES)
- Vacancies (PES, MoL)
- Non-ad-hoc sector-specific more detailed employment and vacancy statistics (e.g. collected by sector councils, chambers of commerce, trade unions or employers' organisations)

Employment trends by occupation



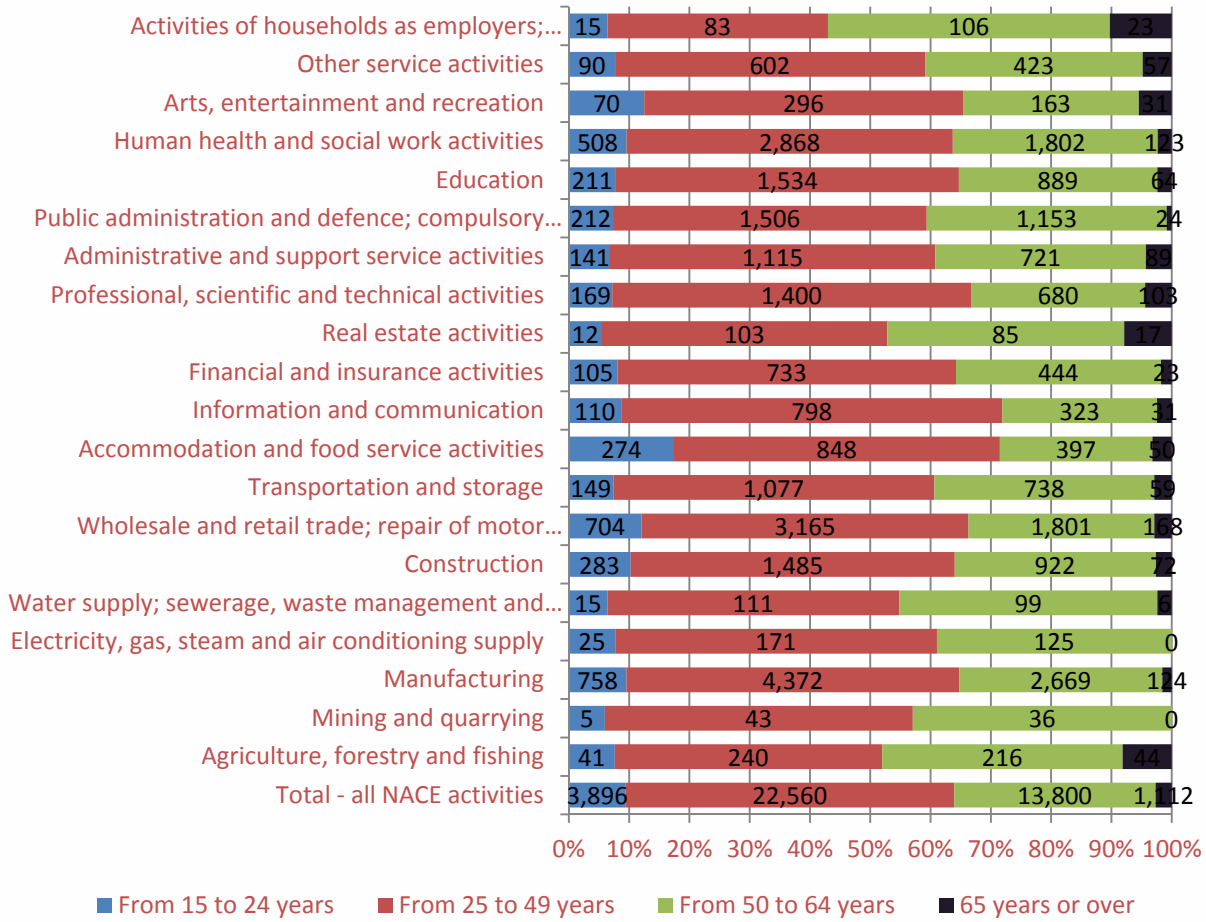
Source: ILOSTAT database (LFS)

Employment trends by economic activity



Source: ILOSTAT database (LFS)

EMPLOYMENT BY AGE GROUP IN SECTORS GERMANY 2016



Source: Eurostat (LFS)

Data needed

- LFS/employer survey – employment by age and sector
- robust samples

Strengths and weaknesses

- Enables to estimate some part of outflows (relacement demand) without panel data
- Usefulness depends on how detail sector classification is available
- Different and evolving retirement age in different sectors needs to be considered

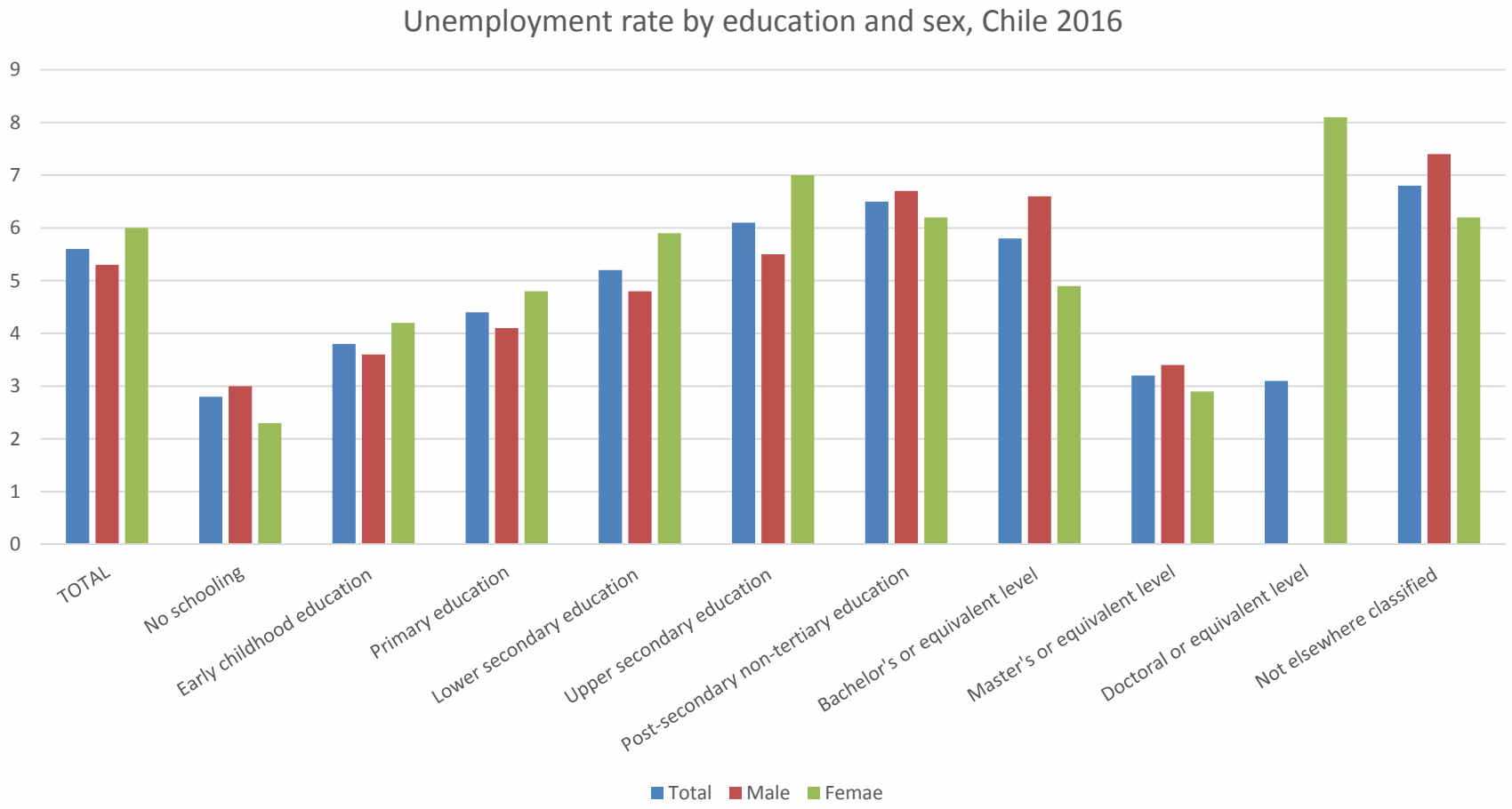
Measurement of mismatch

Some examples on skills mismatch measurement

Mismatch measurement options and sources

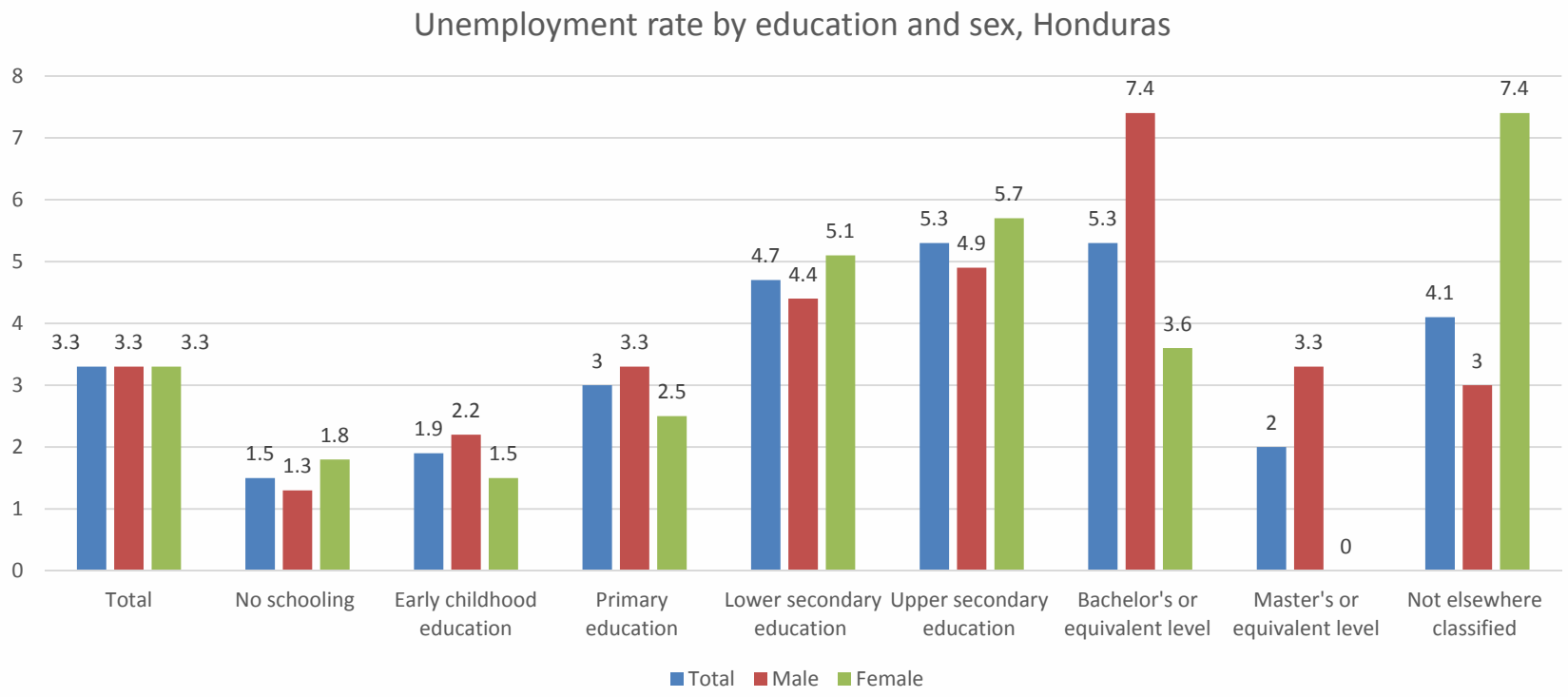
- Comparing skills levels and education levels of those in employment (ISCO /ISCED) – normative or statistical (session 1) (LFS)
- Subjective self-evaluation on over/under education or over/ under skilling (special surveys, e.g. ILO SWTS)
- Unemployment rate by education and age (LFS)
- Returns on investments into training (wage statistics)
- Tracer studies on course graduates
- Vacancy and job seekers statistics

Unemployment rate by level of educational attainment



Source: ILOSTAT database (LFS)

Unemployment rate by level of educational attainment



Source: ILOSTAT database (LFS)

Graduate tracer surveys

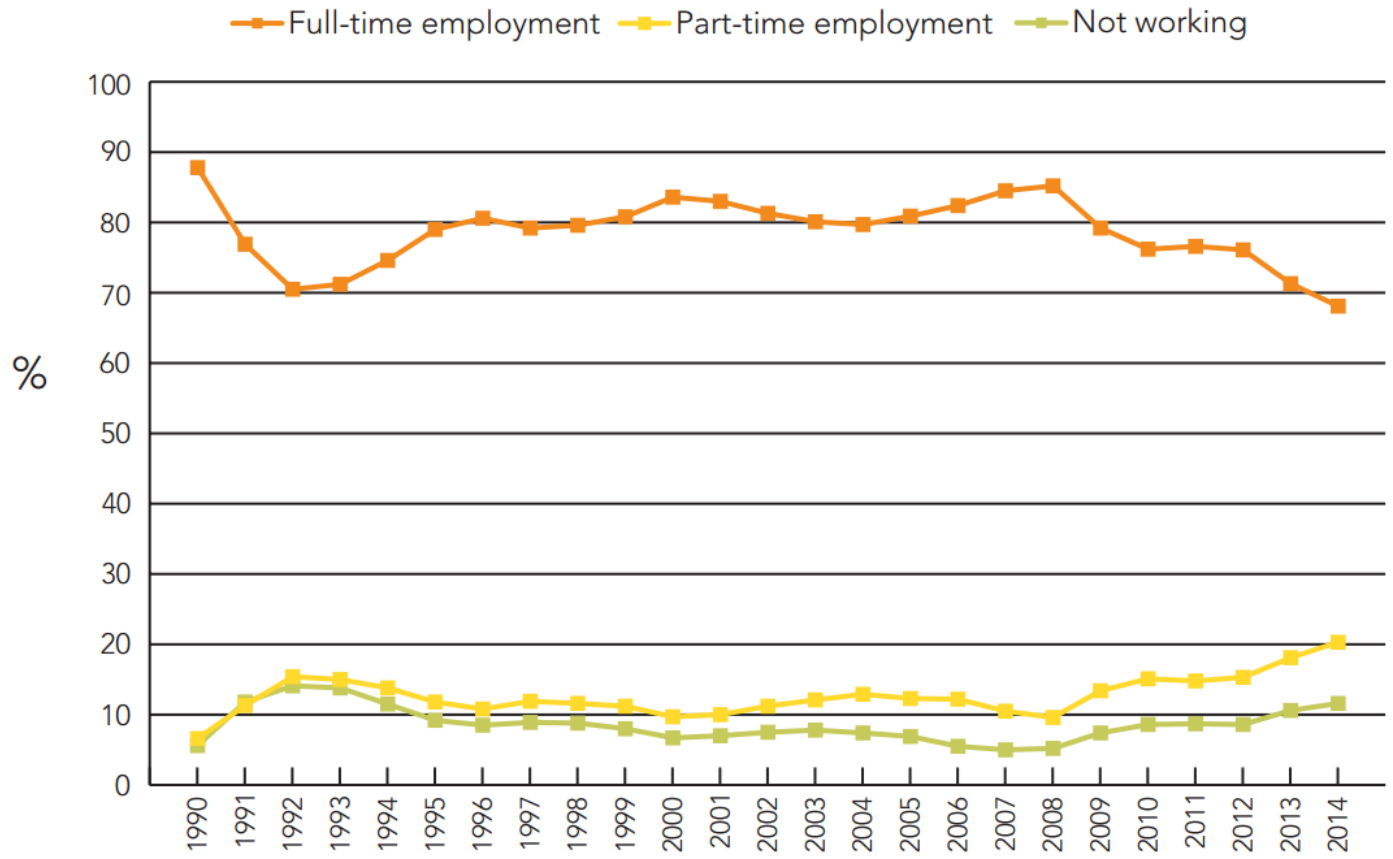
Australia, based on survey of graduates, 4 month after completion

Data needed

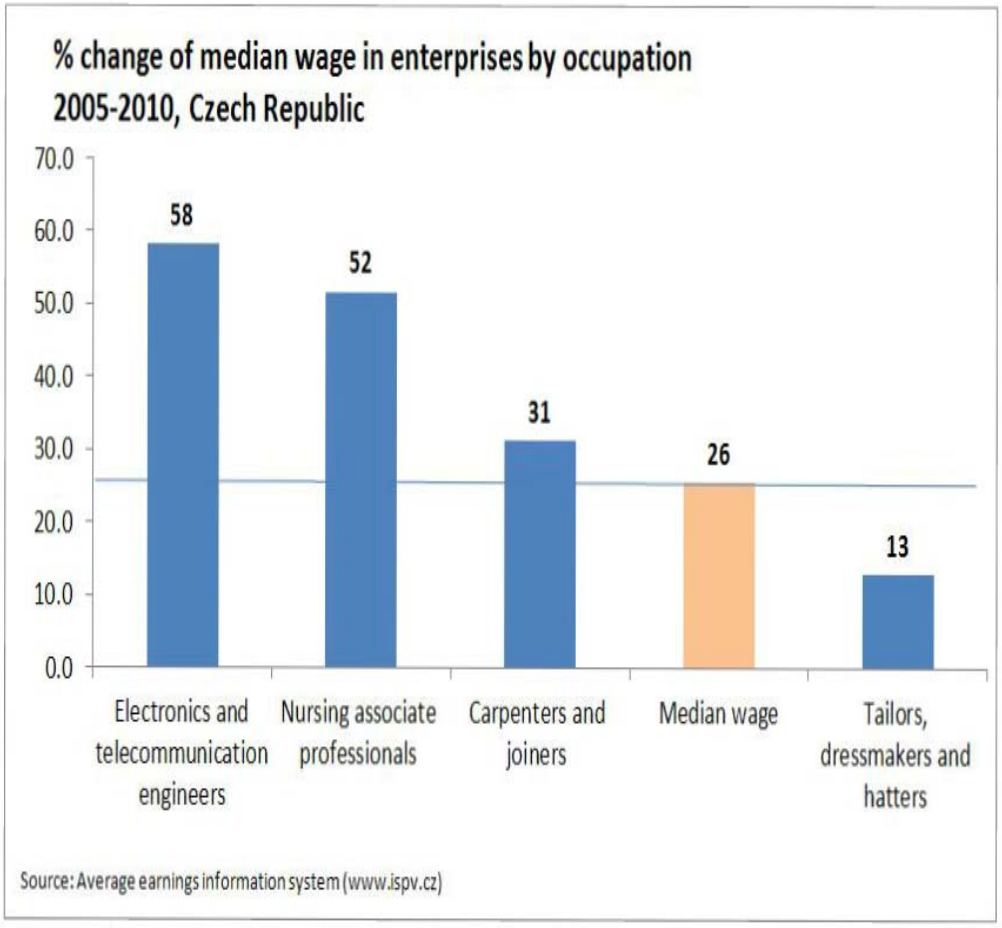
- Tracer surveys

Strengths and weaknesses

- May be difficult to stay in touch with graduates



Returns on education, or simply wage change per type of education



Data needed

- Reliable data on wages (labour force or HH surveys)

Strengths and weaknesses

- Strong theoretical grounds
- But markets are not perfect (wage bargaining, investment incentives, tax breaks etc.)
- Wage data subject to measurement error

Labour Force Survey (LFS)

- Rich information
- Regular (time series)
- All information available by gender / age
- Covers the households from the whole economy (formal and informal)
- Important input in modelling / projections

What types of information are collected by PES?

Administrative Registries

JOB SEEKERS

- Gender
- Group of age
- Location
- Occupation
- Desired working conditions

VACANCIES

- Wages offered and type of contract, working hours
- Qualifications and experience required
- Type of establishment –size-
- Sector, industry, location
- Average time required to fill a vacancy

Job vacancies per occupation

Labour shortages

Hard-to-fill positions

IDENTIFY AREAS OF MISMATCH

One stop shop information channelling

Where different pieces meet together and become useful:

O*NET OnLine
A proud partner of the americanjobcenter® network

http://www.onetonline.org/

http://atlas100.ru/en/

Sri L
www.srilankajobs.net

http://www.srilankajobs.net/

New Zealand – Smartphone application

Australian Government
jobactive
JOB OUTLOOK
An Australian Government Initiative

http://joboutlook.gov.au/

Government of Barbados
Ministry of Labour
Barbados Labour Market Information System

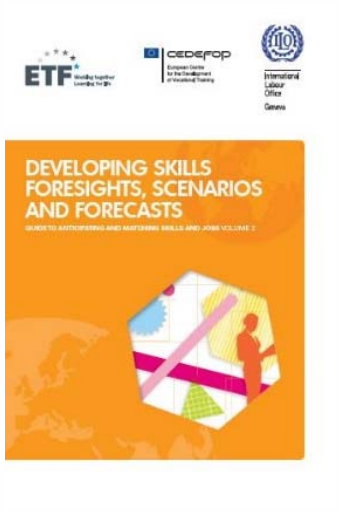
https://labour.gov.bb/neb-one-stop-resource-centre

Volume 2:
Developing skills forecasts, scenarios and foresights

ETF Working together Learning for life

CEDEFOP European Centre for the Development of Vocational Training

OIT Oficina Internacional del Trabajo

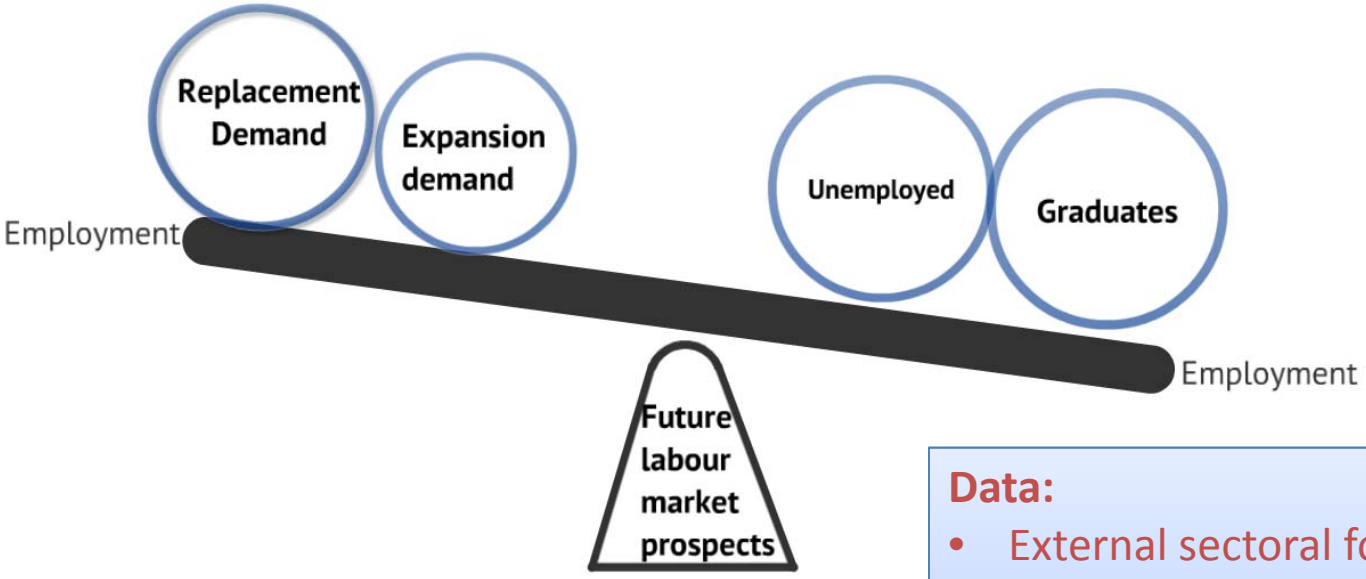


The guide

- Gives options for forecasts and projections at national or sector level (Input/Output modelling, SAM, CGE economic growth modelling) and
- Qualitative foresights
- Defines when which approach is more appropriate
- Defines feasibility in terms of data availability and requirements (e.g. stakeholders' involvement)
- Two annexes with multiples good practices

Level of question	Type of question	Some key headline questions	Type of methodology
Jobs	Quantitative	How many direct jobs now and in the future?	Quantitative, Qualitative
		How many indirect jobs now and in the future?	
		How many induced jobs now and in the future?	
Occupations /skills	Qualitative	What occupations? How they should be defined? What are the boundaries between occupations?	Qualitative
	Quantitative	How many people in each occupation? What is the resulting demand for skills?	Quantitative, Qualitative
	Qualitative	What skills and competencies? How do these relate to occupations?	Qualitative
Education and training	Qualitative	What sources of skills are available? What types of training and education are needed? How can they be provide?	Qualitative
	Quantitative	What is the existing stock of people with the right skills to be recruited? What is the current flow of newly trained people? What flow will be needed in the future?	Quantitative, Qualitative

QUANTITATIVE MODEL
Czech Republic – model ROA CERGE



Data:

- External sectoral forecast (Cedefop, Ministry of Finance, National Training Fund)
- Data on graduates and enrolments
- Labour force survey – structures of employment

5 year horizon
30 occupation clusters
27 education clusters

http://en.nvf.cz/predvidani-kvalifikacnich-potreb

QUANTITATIVE MODEL
CR– presentation of results

Occupation profiles

The model feeds further analyses and information products on national and regional level

Example:
What are labour market prospects of a welder?

Name of the occupational group	Founders and welders
Number of people employed (2011)	9600 person
Employment trend (since 2005)	NO CHANGE

Employment by industry in region

Industry	What part of this group jobs is created by this industry (2011)?	What is the industry employment trend within the region (2008-2011)?	What is the industry forecast (for whole country) till 2020
Metallurgy and metalworking industry	48%	SMALL DECLINE	SMALL DECLINE
Automotive and mechanical engineering	38%	SMALL DECLINE	NO CHANGE
-	-	-	-
Other industries	14%		

Labour market opportunities for the occupational group

Indicator	This group	Region average
Job seekers (2011 average and trend during this period)	517	-
Job vacancies (2011 average and trand during this period)	243	-
Job seekers per one vacancy (2011 average)	2,1	12,8
Unemployment rate (2011)	5,1%	11,9%
Median wage (2011)	27 500 Kč	19 500 Kč

Qualification

Level of education for workers within this group		Best suitable field of study
Share of employees with tertiary degree	-	Engineering and metal processing
Share of employees with secondary degree	98%	Secondary (ISCED 3c)
Number of graduates of best suitable field of study in the region		738 persons
Forecast of graduates for this field of study (2011-2016)		SIGNIFICANT DECLINE

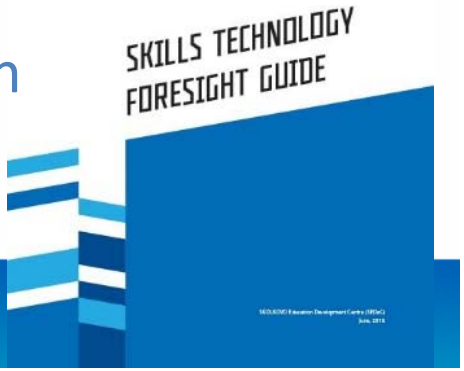
Age structure

Share of persons in the group aged 50+ in the region	Share of persons in the group aged 50+ in the country	Ageing index (region vs. national average)
18%	24%	0,73

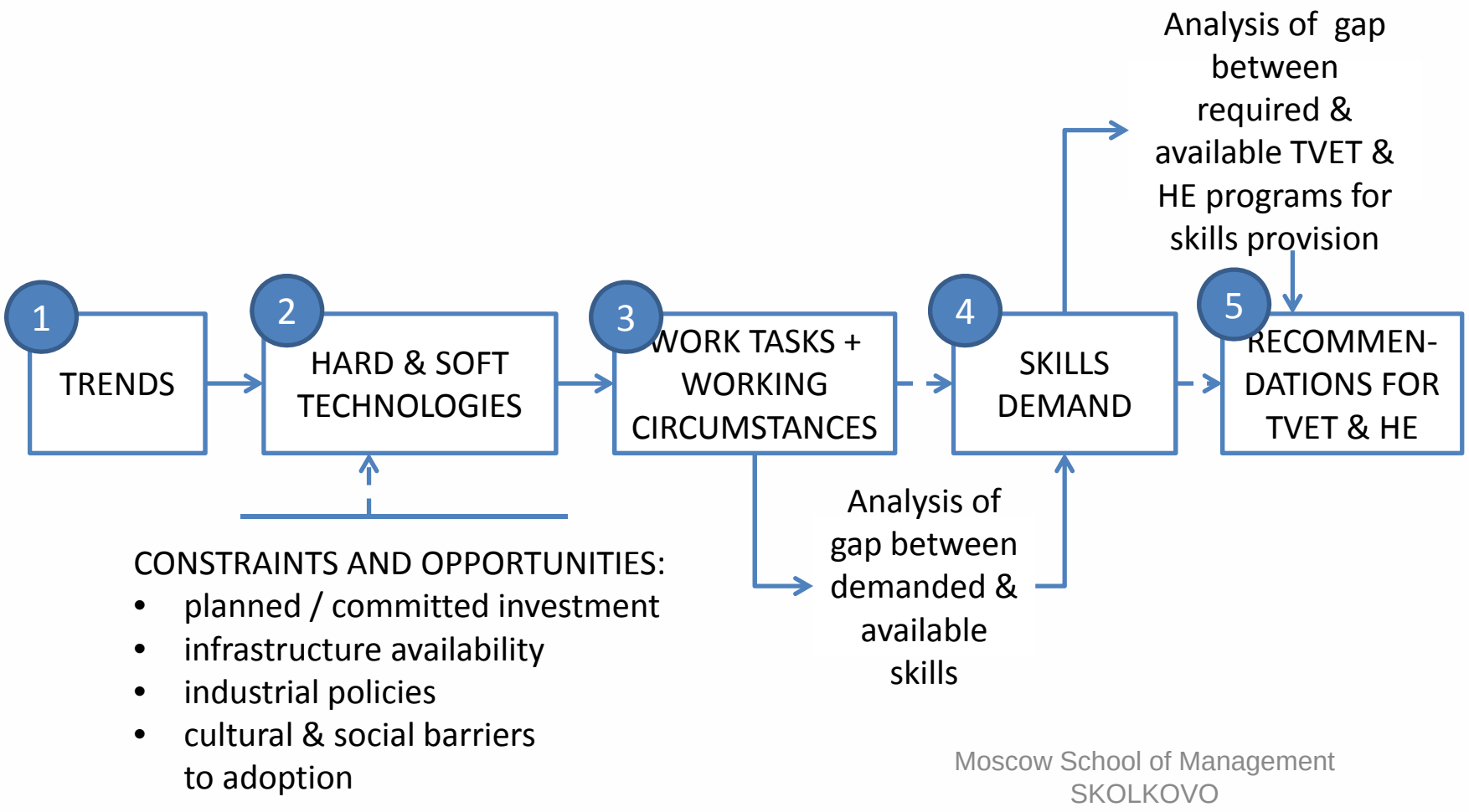
Summary of key findings

Qualitative:
ILO-MSM Skolkovo Technology foresight of future skills

- New tool. Built on technology foresights and skills foresights
- Built on the foresight experiences in Brazil, China, the Czech Republic, Germany, India, Japan, Korea, Romania and Russia
- Targets sectors exposed to large technological changes
- Interactive. Based on social dialogue
- The beauty of the method is its simplicity. Could be done in a couple of months
- Piloted in Armenia food processing and ICT/Precision Engineering and in Vietnam metal processing



Skills Technology Foresight: Key Steps



Moscow School of Management SKOLKOVO

Technology foresight of future skills in Armenia

Sectors:

- Food processing
- ICT/ Precision engineering
- 2 foresight sessions each of about 30 participants

Roadmapping

(2016, 2020, 2030):

- Identify soft and hard technologies, drivers of change, work tasks, technical and core skills.
- Validation.

Resuts and findings:

- Social dialogue and implementing committees established with sectors' ownership of findings
- Map of the future and a vision created
- 20 demanded skills and jobs of the future identified
- 5 programmes for two sectors proposed to improve relevance of training (e.g. retention of workers, collaboration with diaspora, on-the-job training)

Navigator through Jobs of the Future

‘Navigator’ lists over 120 jobs of the future in 20 different sectors, showing where, how, and why new jobs will emerge. It has already become an important career advising tool for teenagers, and has encouraged many universities & colleges across Russia to revise their educational programs

Volume 3:
Working at sectoral level

ETF Working together Learning for life

cedefop European Centre for the Development of Vocational Training

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Why sectoral approaches?

- Sector is crucial to understand the key drivers of change in skills demands to have sectoral focus and perspective
- Clear stakeholders
- Easier to facilitate coordination among all relevant stakeholders and social dialogue
- Reduce complexity and scope of interventions
- Specific skills questions (e.g. gaps, occupational change) need the sort of close up examination that sectoral research enables
- More chances to provide immediate results, and thus easier to ‘sell’ the idea
- Linked to industrial policies, investment decisions etc.

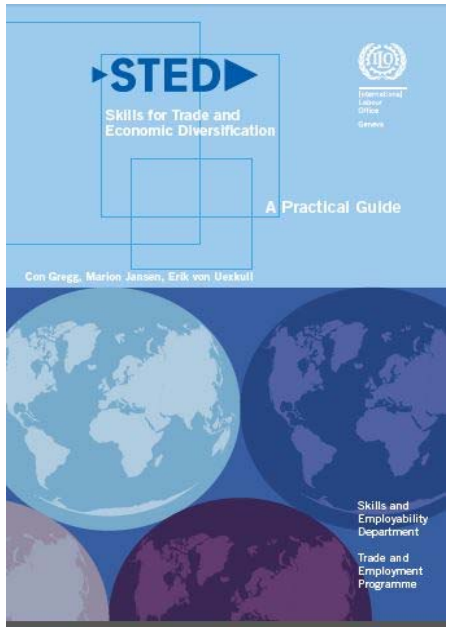
The guide

- Lists all methods possible to use at sectoral level, quantitative as well as qualitative, their advantages and disadvantages (table 1, chapter 2)
- Institutional arrangements at sectoral and factors of success (chapter 3)
- Practical step-by-step considerations (defining the sector – data audit – data gathering – analsysis – consultation process) (chapter 4)
- Annex with multiple good practices

The guide: institutional story - success factors

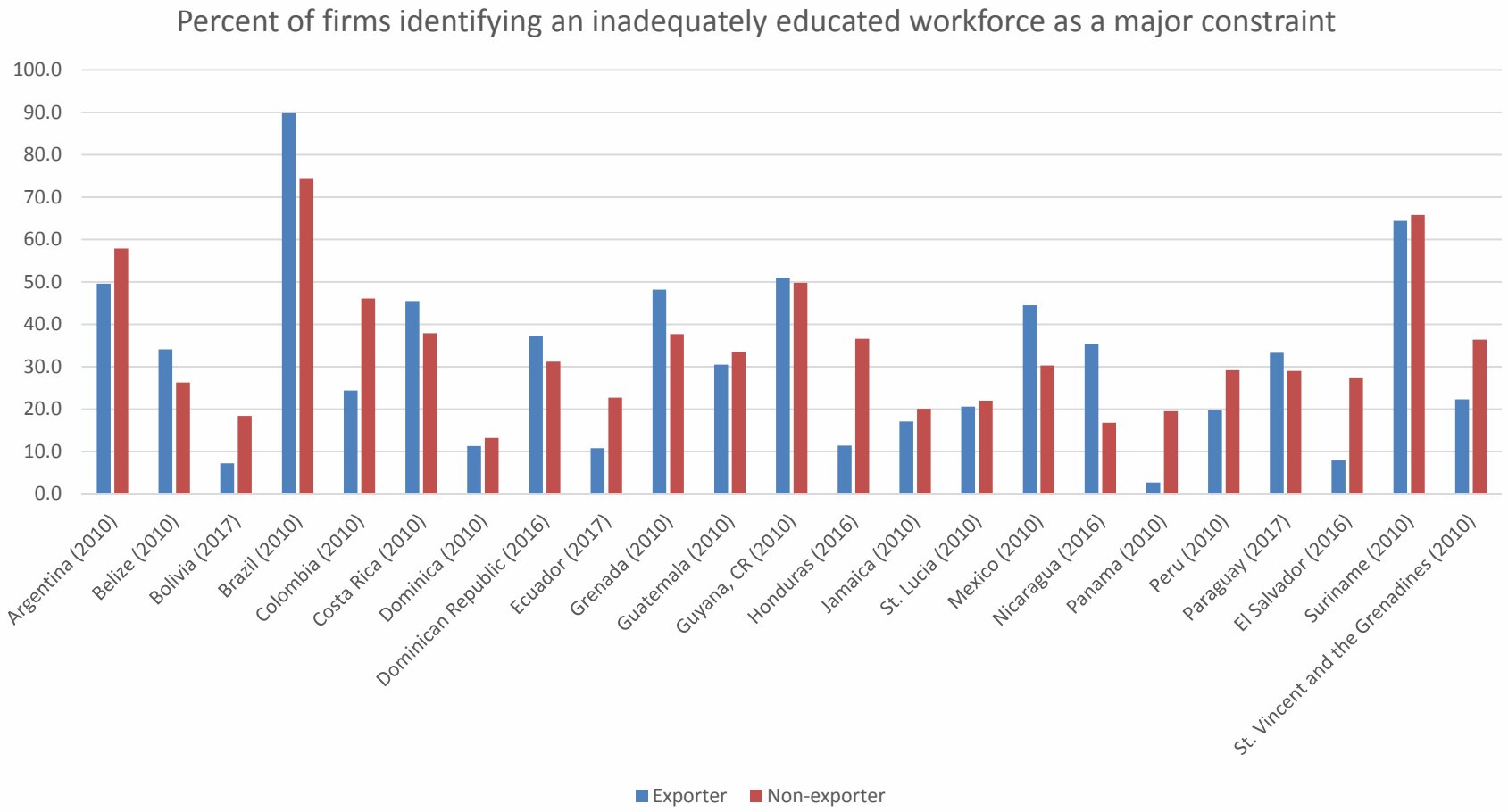
- Clearly defined functions and objectives
- Led by industry towards achieving its vision
- A shared vision for the industry (observatories in France, SENAI's'Antenas Thematicas in Brazil)
- Facilitate broader economic/development goals (Canada – restructuring, Singapore – new industries and high-tech products; developing countries – broader development and poverty reduction goals)
- Capacity to analyse and use LMI, and implement resulting policies and measures
- Maximise the use of financial incentives (seed public funding, tapping on national funds – Australia, low-skilled jobs taxation – Singapore, (sectoral) levy funds – Brasil, S.Africa, Australia, Netherlans)
- Make different elements of the system work hand in hand (complement central, sectoral and sub-national levels)
- Monitoring and evaluation

Example: ILO - STED



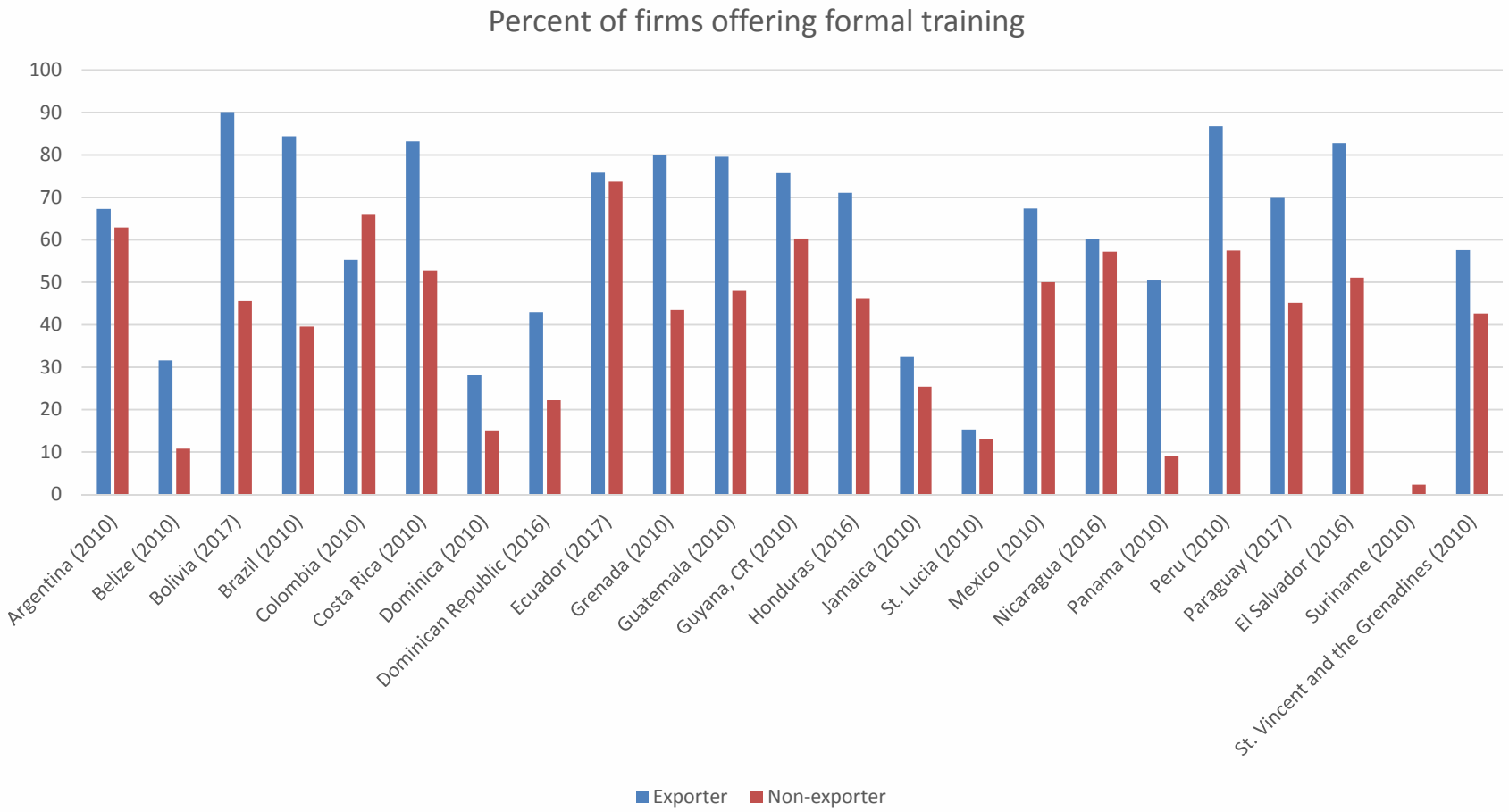
- STED – Skills for Trade and Economic Diversification
- ILO's Sector-based methodology to provide strategic guidance on integrating skills development into policies to strengthen traded sectors
- Designed to use skills to:
  - Improve competitiveness
  - Improve position in international trade
  - Drive growth in output and sales
  - Create more decent employment
- Essentially, a combination of strategic analysis & social dialogue
  - Skills sector studies for traded sectors,
  - With strong social partner and stakeholder involvement, and engagement

Skills availability can enable better export performance



Source: calculated from the WB Enterprise Survey

Exporting firms are more skills intensive and offer more training



Source: calculated from the WB Enterprise Survey

Detailed STED Analytic Framework

Stage 0: Choice of sectors

Sector Selection

Stage 1: Sector position and outlook

Sector Characterisation

Business Environment

Envisioning the Future

Stage 2: Business capability implications

Gap in Business Capabilities Required to Achieve Objectives

Stage 4: How many workers by skill type?

Stage 3: What type of skills?

Implications for Types of Skills Needed

Modelling Employment and Skills Demand

Stage 5: Skills supply gap

Skills Supply

Gap between Skills Supply and Types of Skills Needed

Gap between Skills Supply and Numbers Needed

Stage 6: Proposed responses

Proposed Response to Future Skills Needs

Full- Cycle STED Rapid Analytic and Implementation process

STED Implementation phase

STED Analytic phase

Choosing Sectors

Output document: Note on sector selection

Desk Research

Output document(s): Report(s) on desk research

Existing ILO Enterprise Survey and Trade Studies on Jordanian QIZs

STED Technical and Policy Workshop

Output document(s): Report on Workshop

Conclusions and Recommenda-tions

Output document(s): Finished STED report(s)

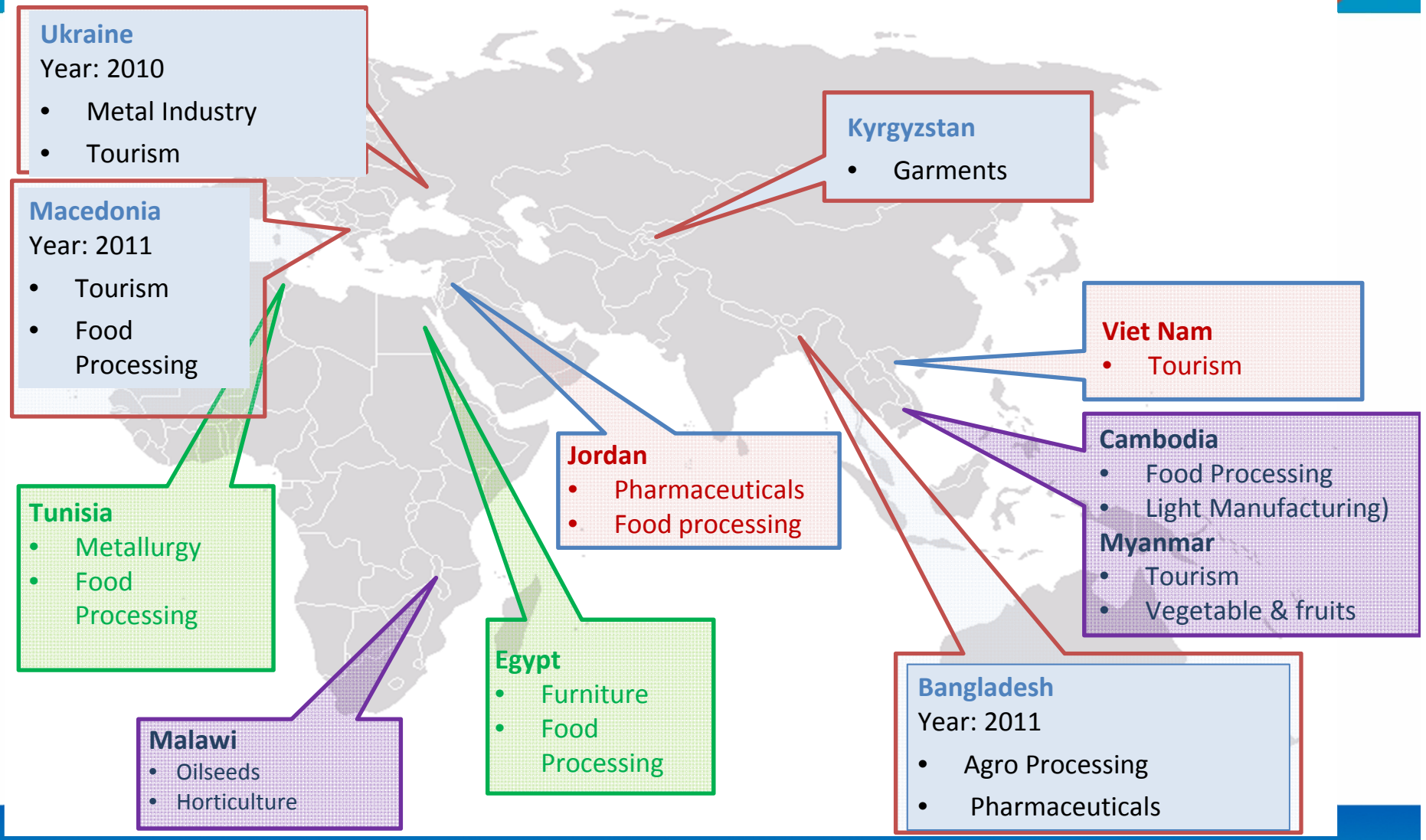
- *Direct implementation of recommendations under the project in collaboration with partners*
- *Building and maintaining institutions for continuous skills dialogue and support to implementation (such as skills councils)*
- *Training adaptation, design and delivery (access to training – better distributional effects from trade revenues)*
- *Integration into broader technical assistance projects in the area of skills, trade, sector development and employment promotion*
- *Capacity building on Skills Anticipation for government and other stakeholders based on the STED methodology*

Consultation and capacity development with national constituents – *government, employers, workers*

Consultation and capacity development with sector stakeholders
(employers, workers, government, education and training providers etc.)
through steering committees and/or stakeholder workshops

STED applications so far

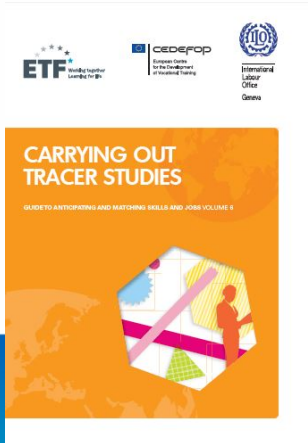
(Currently active in 5 countries and 10 sectors)



Up-coming STED work in Benin, Ghana, Guatemala, Morocco and the Philippines

Anticipating and matching skills and jobs: Volumes 4-6

- Next year - available in Spanish
- Volume 4: The role of employment service providers
- Volume 5: Developing and running establishment skills survey
- Volume 6: Carry out tracer studies



Is there an ideal approach? Pros and cons

Alternative approaches	Advantages	Disadvantages
Formal, national level, quantitative, model-based projections	Comprehensive (typically all sectors); consistent; transparent; quantitative.	Data-hungry; costly; not everything can be quantified. May give a false impression of precision/certainty.
Skills surveys of employers	Direct user/customer involvement; easy to set-up and carry out.	May be very subjective; inconsistent; costly; can too easily focus on the margins rather than skill gaps within the current workforce; limited reliability of information on future
Tracer studies / graduate surveys	Ability to provide useful information for improving planning and programming relatively low cost, easy execution.	Demand for detailed information about sample groups, confined to workers' early market experience and findings may be biased.

Is there an ideal approach? Pros and cons

Alternative approaches	Advantages	Disadvantages
Scenarios and foresights	Strong on sectoral or other specifics; can be used when limited data available. Helps us to avoid unpleasant surprises, make better decisions today inspire, engage and enable shared action.	Risk of inconsistent across sectors, areas, etc.; can be constructed as the "official future"; people may not be able to suspend their disbelief. May suffer from cultural/cognitive myopia; cannot be validated.
Delphi-style methods	Holistic; applicable in situation with limited data availability. A possibility to avoid large group gatherings - virtual participation; handles single or multiple questions; brings together large number of experts and different opinions.	Time-consuming process; labour intensive; participant expertise may influence results.
Focus groups /round tables	Useful to improve and develop ideas; strong tools to validate preliminary results/ideas/tools/strategies.	Importance of moderator is often underestimated; opinions can be biased (group thinking effect); participants may be reluctant to share some opinions in a group.
Sectoral approaches	Sector is crucial to understand the key drivers of change Clear stakeholders - Easier to facilitate coordination among all relevant stakeholders and social dialogue Reduce complexity and scope of interventions	Partial, especially when it comes to quantitative modelling Engagement of SMEs,SMEs in rural and remote areas and coverage of informal and unorganised sector is a challenge

Thank you!

"*When the winds of change blow, some seek shelter, others build windmills*" – an old Chinese Proverb