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SKILL NEEDS ANTICIPATION: SYSTEMS AND APPROACHES

Analysis of stakeholder survey on skill needs assessment and anticipation

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Foreword

This publication is a product of the joint survey, among key constituents and partners, conducted by the International Labour Organization (ILO), the European Centre for the Development of Vocational Training (Cedefop), the European Training Foundation (ETF) and the Organisation for Economic Co-operation and Development (OECD). The survey questionnaire was originally developed by the OECD with inputs from other agencies. The survey addressed ministries of labour and education, and trade unions and employer organizations in 61 countries on systems, approaches and institutional frameworks that steer relevance of training provision to labour market needs. It included questions about the partners involved in assessing and anticipating skills needs, the modes of collaboration and coordination, the use of the outcomes in policy formulation, and the challenges in implementation.

Understanding current and future labour market demand, and how it will shape both the need to reskill the current workforce and vocational training for young people, helps to formulate skills development and active labour market policies. It also informs decisions on budgetary allocations to various vocational training programmes and contributes to the design of competency standards. Relevant labour market information (LMI) on current and future skill needs also supports individual decisions and career counselling and vocational guidance services.

The General Conference of the International Labour Organization in 2014 requested the ILO to develop knowledge and tools for anticipating future skills needs. This was in line with the ILO Human Resources Development Recommendation No.195 (ILC, 2004) which guides member States to support and facilitate research, which could include "identifying, measuring and forecasting the trends in supply and demand for competencies and qualifications in the labour market…". The European Commission's New Skills Agenda for Europe also invited Member States, social partners, the industry and other stakeholders to work together to improve the quality and relevance of skills formation, make skills more visible and comparable and improve skills intelligence and

information for better career choices (European Commission, 2016).The joint inter-agency survey has helped to take stock of current approaches in assessing and anticipating skill needs and to detect good practices and capacity development needs among member States.

Analysis of the survey results provided rich information on the wide variety of approaches and methodologies in use. Advanced systems tend to coordinate skills assessments and anticipation better and to combine various approaches in a complementary way. Major problems are not lack of methods but piecemeal, irregular and uncoordinated actions, and poor data, especially among lower income countries. Many survey respondents agreed that without relevant institutional mechanisms that cater for a regular exchange of information between labour market demand and supply, better coordination and systematization cannot be achieved. Capacity development for all constituents and partner institutions involved in skills anticipation has been identified as another priority. The survey results, therefore, provide useful guidance to partnered international agencies for assisting member States and developing the capacity of our constituents.

One of main obstacles cited is insufficient funding, not only in low income countries but also in some middle and high income examples. It is often a question of priorities, with skills development funding first to be sacrificed in cases of budgetary cutback. However, investment in relevant skills contributes to attracting investments, and to increasing the productivity of workers and competitiveness of enterprises; in this respect it is crucial to sustainable employment generation and inclusive growth.

We hope readers will find this report a useful contribution to documenting examples of good practices and identifying areas for improvement in systems of skill needs anticipation.

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Abbreviations

Cedefop	European Centre for the Development of Vocational Training
ETF	European Training Foundation
ILO	International Labour Organization
ISC	Industry Skills Council
LMI(S)	labour market information (system)
OECD	Organisation for Economic Cooperation and Development
PES	Public Employment Service(s)
TVET	Technical Vocational Education and Training

Country abbreviations

ALB	Albania
AUS	Australia
AUT	Austria
BEL	Belgium
BEN	Benin
BGD	Bangladesh
BGR	Bulgaria
BIH	Bosnia and Herzegovina
BRA	Brazil
CAN	Canada
CHE	Switzerland
CHL	Chile
COL	Colombia
CYP	Cyprus
CZE	Czech Republic
DEU	Germany
DNK	Denmark
EGY	Egypt
ESP	Spain
EST	Estonia
FIN	Finland
MKD	Former Yugoslav Republic of Macedonia
FRA	France
GBR	Great Britain
GRC	Greece
HRV	Croatia
HUN	Hungary
IDN	Indonesia
IND	India
IRL	Ireland
ITA	Italy
JAM	Jamaica
JOR	Jordan
JPN	Japan
KHM	Cambodia
KOR	Korea
KOS	Kosovo
LTU	Lithuania
LVA	Latvia
MDG	Madagascar
MLT	Malta
MNE	Montenegro

MOZ	Mozambique
MWI	Malawi
NLD	Netherlands
NOR	Norway
PER	Peru
POL	Poland
PRT	Portugal
ROU	Romania
SLV	El Salvador
SRB	Serbia
SVK	Slovakia
SVN	Slovenia
SWE	Sweden
TUN	Tunisia
TUR	Turkey
TZA	Tanzania
UGA	Uganda
USA	United States
ZMB	Zambia

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The report was prepared in the framework of the ILO Global Product "Mismatches between jobs and skills" implemented under policy Outcome 1 "More and better jobs for inclusive growth and improved youth employment prospects". Useful comments and suggestions were provided by Anastasia Fetsi and Cristina Mereuta (ETF), Konstantinos Pouliakas and Alena Zukersteinova (Cedefop), Paul Comyn, Olga Strietska-Ilina and Bolormaa Tumurchudur Klok (ILO), and Fabio Manca (OECD). Gary Horsley, AC Marketing, edited the language. Annette Brandstater (ILO) formatted the manuscript.

Executive Summary

Anticipating and building skills for the future is essential in rapidly changing labour markets. The International Labour Organization (ILO), the Organisation for Economic Co-operation and Development (OECD), the European Centre for the Development of Vocational Training (CEDEFOP), and the European Training Foundation (ETF) conducted a joint survey on governance mechanisms and institutional frameworks that steer relevance of training provision to the labour market needs in over 60 countries. The survey was conducted among key stakeholders in skill governance: ministries of labour and of education, worker unions and employer associations. This report collates empirical evidence generated through the survey.

Skill anticipation relies on various methods that collate and summarize labour market information (LMI) to analyse skill shortages and labour market imbalances. They are often forward- looking and can be combined to provide a more detailed and multifaceted picture of the labour market.

The research found that a wide range of approaches is used across the surveyed countries. While more elaborate approaches or combinations tend to be used in higher income countries, a wide variety of approaches and methods is still used within low and middle income countries.

The frequency of skills assessments ranges from multiple times a year for analysis of existing statistics, to once every five years for approaches repeated in a consistent way. However, many countries also report that all or most of the assessments are only revised or updated infrequently, which shows a lack of structural approach to skill anticipation. The level at which approaches are used, be it national, sub-national or sectoral, also varies with method; key responsibility for an approach varies with intention and use.

An important aspect of skills anticipation systems is to develop and support institutions and frameworks to generate, use, disseminate and inform decisions by data and analyses. It is important to recognize the variety of approaches and

solutions available. There is no single solution or blueprint that can or should be applied to every country.

Common problems in the use and development of skills anticipation tools include those of skills measurement where qualifications and occupations have to serve as proxies for skills; frequency and level of detail of data, as well as the reliability of the data used, can also be issues.

LMI and intelligence, including skill needs anticipation, usually undergo some form of validation by stakeholders. The results can then inform education and labour market policies as well as be disseminated to a wider range of users. The main reported use is in education and training planning, both in terms of contents and choice.

Many countries use forward-looking skills anticipation methods to assist them in formulating policy responses that overcome skills mismatch. In looking to the future, however, approaches are usually grounded in an assessment of the current situation as reflected in current data and recent developments. These usually form the basis for any methodology analysing the future, be it qualitatively or quantitatively.

Collaboration among stakeholders with direct involvement, including ministries and government agencies, and other stakeholders not directly involved in policy making, also poses challenges in analysing and using the LMI, validating their outcomes and translating into adequate policy responses. Other obstacles beyond the coordination of collaborative efforts are the lack of institutional and expert capacities and the lack of funding. The inclusion of social partners and stakeholders in analysing skills needs and formulating or reviewing policy options seems to be instrumental in including the full breadth of opinions.

Obstacles and deficiencies were identified in all countries. This serves as a reminder that skills assessment and anticipation is a process in which continuous, gradual improvement is needed. This improvement should not only be in the underlying data or the methodology to provide evidence, but should also include collaboration in analysing and discussing the results, as well as in improving the process of policy formulation and implementation based on the evidence.

Social dialogue among stakeholders on skill governance issues is a key means of steering the training relevance, the importance and acceptance of results, and the distribution and discussion of key outcomes among their members. To achieve this, technical expertise has to be built up both in the organization providing elements of the skills assessment itself and among ministries and other stakeholders mainly involved in discussion on policy formulation and implementation.

1. Introduction

1.1. Background

The International Labour Organization (ILO) has been promoting the importance of skills development relevant to labour market needs for many decades through its key strategic documents: HRD Convention 142 (1975), HRD Recommendation 195 (2005), the ILC Conclusions on skills for improved productivity, employment growth and development (2008). Similarly, the G20 Training Strategy the EU Agenda for new skills and jobs, and the EU New skills agenda for Europe emphasize the relevance for their members.

Anticipating and building skills for the future is essential in rapidly changing labour markets because skills shortages can produce adverse socio-economic consequences on development and employment. Given the gap in knowledge of skills needs anticipation practices, the ILO, the Organisation for Economic Co-operation and Development (OECD), the European Centre for the Development of Vocational Training (CEDEFOP), and the European Training Foundation (ETF) joined efforts to conduct a joint survey in 2014-15 on this topic to build an appropriate knowledge base. The joint survey was implemented through independent surveys by each organization. Results of the individual surveys were published by OECD (2016) and ETF (2016). The joint survey covered 61 countries (see Section 2) and developed a rich knowledge base of practices with the potential to improve policy advisory services in participating countries and organizations.

The survey contained quantitative elements that enable answers to be coded for statistical analysis, but also included many open questions that allowed for better understanding of the situation in a country and offered greater context to the quantitative answers. While many quantitative answers might seem comparable across countries, they are often a matter for interpretation for a given situation that a country faces; Section 2 includes elaboration of how this might influence the results. Throughout the quantitative analysis, the qualitative answers provided in the open questions, or in explanations linked to the closed

questions, are used to provide context for interpreting the results. Textboxes contain country specific descriptions that are deemed typical for choices and institutional settings within these countries.

1.2. The survey – contents and coverage

The survey sought to identify effective strategies for assessing, anticipating and responding to changing skill needs. It particularly aimed to gather information from key actors such as ministries of labour and education, social partners, and other relevant institutions regarding the nature and scope of skills anticipation practices in the country:

i. the extent to which skills assessments and forecasts influence labour market, education and/or migration policy;

ii. the level of involvement of key stakeholders including ministries of labour and education, local and regional authorities, employers and trade unions;

iii. the existence of good practices and/or barriers encountered in using such approaches in policy development.

Having gathered country-level data, this inter-agency report based on the survey, synthesizes some of the key results. In this comparative report, we aim to reveal country experiences in skill needs anticipation, both good practices and challenges in developed and developing countries, and to promote policy learning in order to improve skills development systems. The countries included in the study are listed in Table 1.

1.3. A methodological note on interpreting the surveys

The report extends earlier work by OECD, ETF and Cedefop collecting information on the use and application of various methods and tools of skills anticipation and labour market monitoring towards improved skills governance and education policy (OECD, 2016; ETF, 2015; Cedefop, unpublished). It considers not only the degree of cooperation at governance level and the organization of skills anticipation systems, but also the usage of its results.

The survey was developed to collect information to generate an overview of skills anticipation activities and how these formed part of governance arrangements. However, there are limitations in interpreting because the results include only those elements that respondents were aware of. As respondents from certain key ministries were gathered along with various other stakeholders (including education and employment agencies, trade unions, employer

Table 1 **Countries covered under the survey by income group and number of responding constituents**

Country	Abbreviation	Income group	Number of respondents					
			Ministries of Labour	Ministries of Education	Employers' Association	Trade Unions	Other Stake-holders	All constituents
Albania	ALB	Upper-middle income	2	2	1	2	0	**7**
Australia	AUS	High income	1	0	0	0	0	**1**
Austria	AUT	High income	1	2	0	0	0	**3**
Belgium	BEL	High income	3	0	0	0	0	**3**
Benin	BEN	Low income	1	1	0	2	0	**4**
Bangladesh	BGD	Lower-middle income	1	3	1	1	0	**6**
Bulgaria	BGR	Upper-middle income	0	0	1	0	0	**1**
Bosnia and Herzegovina	BIH	Upper-middle income	3	6	3	0	1	**13**
Brazil	BRA	Upper-middle income	0	2	0	2	0	**4**
Canada	CAN	High income	1	0	2	0	0	**3**
Switzerland	CHE	High income	1	0	0	0	0	**1**
Chile	CHL	High income	1	1	1	0	0	**3**
Colombia	COL	Upper-middle income	2	1	1	1	0	**5**
Cyprus	CYP	High income	0	1	1	1	0	**3**
Czech Republic	CZE	High income	1	0	1	0	0	**2**
Germany	DEU	High income	1	1	1	0	0	**3**

Country	Abbreviation	Income group	Number of respondents					
			Ministries of Labour	Ministries of Education	Employers' Association	Trade Unions	Other Stake-holders	All constituents
Denmark	DNK	High income	0	1	2	1	0	**4**
Egypt	EGY	Lower-middle income	1	1	1	1	0	**4**
Spain	ESP	High income	0	0	1	2	0	**3**
Estonia	EST	High income	1	0	0	0	0	**1**
Finland	FIN	High income	1	1	1	1	0	**4**
Former Yugoslav Republic of Macedonia	MKD	Upper-middle income	2	1	1	0	0	**4**
France	FRA	High income	2	0	1	1	0	**4**
Great Britain	GBR	High income	0	0	0	1	0	**1**
Greece	GRC	High income	1	0	1	0	0	**2**
Croatia	HRV	High income	1	1	1	1	0	**4**
Hungary	HUN	High income	1	0	0	0	0	**1**
Indonesia	IDN	Lower-middle income	0	0	1	1	0	**2**
India	IND	Lower-middle income	0	0	1	0	0	**1**
Ireland	IRL	High income	0	1	1	1	0	**3**
Italy	ITA	High income	0	1	0	0	0	**1**
Jamaica	JAM	Upper-middle income	1	1	1	1	0	**4**

Country	Abbreviation	Income group	Number of respondents					
			Ministries of Labour	Ministries of Education	Employers' Association	Trade Unions	Other Stake-holders	All constituents
Jordan	JOR	Upper-middle income	1	3	0	2	0	**6**
Japan	JPN	High income	1	0	2	0	0	**3**
Cambodia	KHM	Low income	1	2	1	1	0	**5**
Korea	KOR	High income	1	0	1	0	0	**2**
Kosovo[a]	KOS	Lower-middle income	1	2	2	1	1	**7**
Lithuania	LTU	High income	1	1	1	0	0	**3**
Latvia	LVA	High income	1	1	1	1	0	**4**
Madagascar	MDG	Low income	0	2	1	3	0	**6**
Malta	MLT	High income	0	0	1	0	0	**1**
Montenegro	MNE	Upper-middle income	3	3	2	1	0	**9**
Mozambique	MOZ	Low income	1	1	1	1	0	**4**
Malawi	MWI	Low income	1	1	1	1	0	**4**
Netherlands	NLD	High income	1	0	1	0	0	**2**
Norway	NOR	High income	1	1	1	1	0	**4**
Peru	PER	Upper-middle income	2	1	1	1	0	**5**
Poland	POL	High income	1	0	0	0	0	**1**
Portugal	PRT	High income	1	1	1	0	0	**3**
Romania	ROU	Upper-middle income	0	1	0	0	0	**1**
El Salvador	SLV	Lower-middle income	1	1	1	2	0	**5**

Country	Abbreviation	Income group	Number of respondents					
			Ministries of Labour	Ministries of Education	Employers' Association	Trade Unions	Other Stake-holders	All constituents
Serbia	SRB	Upper-middle income	1	2	1	2	1	**7**
Slovakia	SVK	High income	1	0	1	0	0	**2**
Slovenia	SVN	High income	1	0	1	0	0	**2**
Sweden	SWE	High income	0	0	0	1	0	**1**
Tunisia	TUN	Upper-middle income	1	1	1	1	0	**4**
Turkey	TUR	Upper-middle income	0	1	0	1	0	**2**
Tanzania	TZA	Low income	1	1	1	1	0	**4**
Uganda	UGA	Low income	1	1	1	1	0	**4**
United States	USA	High income	1	0	0	0	0	**1**
Zambia	ZMB	Lower-middle income	1	1	1	1	0	**4**
all countries			**57**	**56**	**52**	**43**	**3**	**211**

Source: Income groups according to Worldbank (Low and middle income: upper-middle income, lower-middle income or low income countries), World Bank 2016.

Note: [a] This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence, hereinafter 'Kosovo'.

organizations) the responses solely reflect the knowledge of those respondents and have not been supplemented by separate desktop research.

This might be of less concern in well-established and well 'settled' skills governance systems, as it can be assumed that respondents may be more aware of main functions and forms of organization. Such general knowledge among respondents, however, is less likely in cases where the institutional skills anticipation mechanisms are in flux, i.e. they are being set up or the system is dynamically changing or developing. There may also be recall bias among respondents, favouring new and recent approaches or experiences while neglecting to evaluate (long-) existing skills anticipation and governance elements.[1]

Evaluating skills anticipation systems in place and national skills governance in these reports shows significant differences in their institutions, the stage of system development and underlying processes. Similar answers about problems might have different implications. For example, lack of adequate data within countries with a well-established labour force might imply that skills identification should be more detailed; in countries that lack or have only recently introduced statistical surveys to cover the labour market (such as Labour Force Surveys) information can be at a much more fundamental level.

The survey did not only cover activities and systems to understand future skill needs but also assessment exercises on current skills needs. While this has allowed for valuable intelligence gathering on activities that help understand labour market needs, it is noted that practically all countries have some form of general LMI collection. Furthermore, employer surveys – often used by countries – may not necessarily inform about anticipated skill needs so much as reflect the state of past skill mismatches, unless a past trend is analysed and projected. In some countries, the main approaches used are contemporary labour market analyses that are only rudimentary in assessing skills needs.

In the subsequent discussion we acknowledge these differences. All figures and tables reflecting outcomes from the combined set of surveys (or discussing qualitative outcomes) should therefore be evaluated carefully taking into account how advanced systems are.[2]

[1] Cedefop notes this in their own analysis of the responses within European countries. It is typical in any survey setting (see, e.g. Coughlin, 1990)

[2] A helpful discussion of this process towards a system of skills anticipation activities in European countries can be found in Cedefop (2016, especially pp. 11-14).

1.4. Objective and contents

In this report we analyse skill needs anticipation practices using survey data from the four international organizations. In doing this, relations between skills anticipation practices and institutional factors are analysed, different approaches are elaborated and country groupings are used to summarize and classify outcomes across the various countries. More feasible approaches are highlighted throughout the report. While there is often a tendency to emphasize 'best practices', we also show that feasible approaches in developing country contexts are implemented and used in various institutional settings and country environments. This should help present the range of available methods and approaches.

This synthesis report provides an overview of skills assessment practices across the world. It also gives suggestions on how to promote global policy dialogue on skills needs anticipation, skills mismatch and skills development systems more broadly.

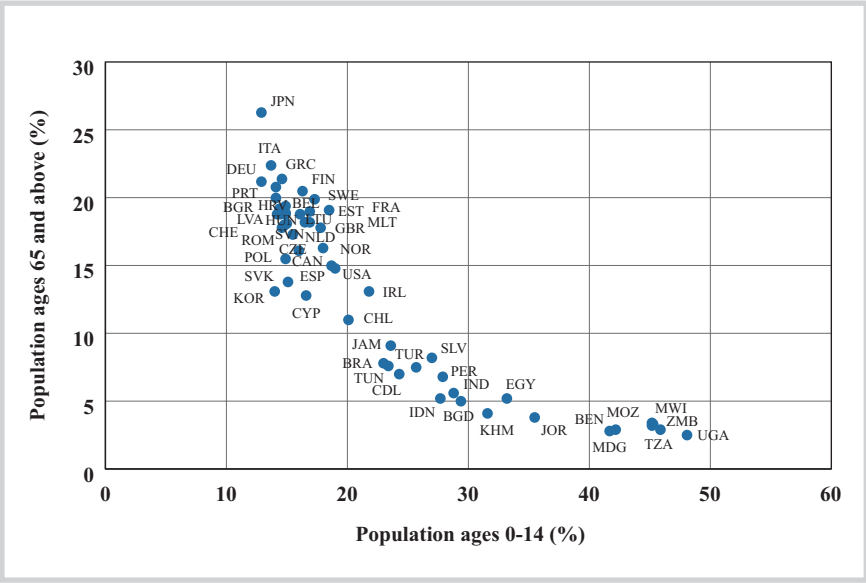
2. Country groups

Skills anticipation methods can rely on different data sets and variables, but choosing the right variables is not always straightforward. One important variable is the age of the employed and unemployed. Many skills are developed by experience, reflecting time on the labour market and age and skills taught in qualifications change. Qualifications which are prone to technological change are likely to reflect quite different embodied skills according to age cohort. Younger workers might, in this context, be much more relevant to the current requirement of labour markets. In addition, replacement demand, measuring the outflow of workers within occupations due to factors such as retirement, is very much dependent on the age structure of occupations. The share of younger workers in a country might be important to potential over- or undersupply, in addition to opportunities to update skills through training young school leavers and graduates. Figure 1 aims to capture this by showing the share of youth and adults in a country as a scatter plot of all the countries that responded to the survey. It plots the share of young people that will have to pick up skills in qualifications in the near future relative to the share of older persons in a population.

The figure shows that some countries are ageing rapidly, as a large share of the population is within the older population group, while the youngest population group has a low share; examples are Japan and Italy. The low share of young people will make adjustments in skill mix of the labour force through updating the contents of qualification less successful – or improve more slowly – than in countries in which the young population will have a much larger share. Other means of updating, for example by continuous training, are likely to be more important than in countries that will be able to update a large share of their skills through the training of the young cohorts.

The policy implication of a country's demographics situation could lead to different preferences or priorities in approaching skills imbalances and skill governance. The policy options and main groups to target might be different, as may the methods with which they can best monitor the country's situation.

Figure 1 Comparing shares of young people and adults



Source: World Bank staff estimates based on age distributions of United Nations Population Division's World Population Prospects, World Bank, 2016.

Along with demographic variables, per-capita income, and analysis using the main labour market indicators (employment rates, unemployment, youth unemployment) help in developing likely challenges for skill governance and policy targets for a country.

The intention is not to discuss individual countries but to introduce country groups used throughout the report. This allows for groupings by background variables. To this end, we use background information on economic and population statistics from the ILO and World Bank, which also allows classifying by key economic variables. This avoids comparing countries that are unequal in their economic means or institutions, which are likely to have potentially different outcomes and challenges. We have analysed the countries reflecting their income level in almost all the figures used in this report.

3. Key concepts

This section will introduce the skills anticipation key concepts and approaches. It is based on a review of concepts and policies.

Policy makers worldwide have a strong interest in anticipating future skills needs. They want to take decisions on labour market policy and skills provision that are grounded in empirical evidence of either a qualitative or quantitative type. Many countries understand that information on future skill needs provides key stakeholders with the means to adjust to potential future imbalances. Also, if individuals (firms or workers) take informed decisions, it helps to avoid distortions and contributes to more efficient labour market outcomes (at least in theory). Overall, this should strengthen education and skills policy and ensure supply is better matched to demand, such that the end result is improved employability, productivity and competitiveness.

Partnerships between policy makers, key decision makers and stakeholders are an important aspect of correctly analysing skill needs, and also in formulating policy responses that are accepted by a broad range of actors involved. Partnerships across different groups should be organized to support the process, rather than paying lip service to the inclusion of all relevant groups. Policy and information needs should also cover the needs of disadvantaged groups which often do not have a strong voice in the policy making process. Broader government objectives should be interlinked, where possible, with the needs of all stakeholders in informing about skill needs and in finding suitable responses.

3.1. Skills anticipation and matching

Many of the decisions for which information concerning future labour market conditions are relevant, are long-term. Education and training usually takes several years and – ideally – will provide a productive source of skills for a longer period of time. Skills anticipation can not only help in terms individuals

guidance and/or education policy, but also in identifying future imbalances that have to be addressed jointly by several stakeholders.

The process of skills anticipation also includes the development of institutions and frameworks that work with the national tools and systems available. It is a longer term process that grows over time and one that has to adjust to national institutional settings, structures and economic needs.

If done well, skills anticipation provides the means to identify future imbalances, brings together key actors in addressing them, and informs the public about the future skills demand and supply. In theory, in such an environment both individuals and firms can take informed decisions efficiently, while education policy can be implemented, grounded in (empirical) evidence that takes the future direction into account.

It is unrealistic to be prescriptive towards countries that want to develop or improve their skills anticipation systems. Assessment and anticipation of skill needs can follow different national paths and routes as tools, coordination and implementation mechanisms are adjusted and tailored to suit the specificity of each country's institutional setting and skills challenges. One intention of this study is to bring together information on institutional structures, and various attempts countries have made to combine qualitative and quantitative sources in skills anticipation for a system of skill governance.

One of the problems skills anticipation aims to address is skill mismatch. Adequate utilization of skills is the goal in each context. In the scientific literature this is by no means a new phenomenon, though the focus is mainly on mismatch at education level.[3] One view of over-education – people working in jobs below their educational level – sees it as over-investment in education, which is costly to society. In contrast, under-education – people working in jobs above their educational level – signals under-investment in human capital that could result in productivity loss. The economics literature discusses individual level over- and under- qualification in terms of wage and welfare effects of skill mismatches, see here especially Hartog (2000) and Leuven & Oosterbeek (2011). These studies show that over-qualified workers suffer from wage penalties relative to similarly qualified workers whose education and training is better matched to their jobs, though they earn more than others at their respective job level if they are over-qualified. Over-skilling or over-skilling plus over-education are more likely than over-education alone to harm employee

[3] Richard Freeman's 1976 book, 'The Overeducated American', was the first to touch on the issue of individuals working in jobs below their level of education. A recent overview is given in Green (2013) and Walker & Yu (2013).

welfare (Sloane, 2013). This approach has also recently been extended to include skill and task complexity (Pouliakas & Russo, 2015).

Within skill mismatches, it is also possible to distinguish between short-term qualitative skill mismatches and long-term qualitative skill mismatches; here, *short-term* qualitative mismatch is temporary and the result of matching under imperfect information. Not all workers find adequate jobs for their qualifications, nor do all firms find the perfect candidate. The implied policy would be that the matching process should be organized more efficiently, either by making information more transparent or by reducing the cost of its acquisition. Long-term qualitative mismatch is more structural. It is the result of changes in qualifications or skills demand in jobs which are not, or only poorly, reflected in the worker's education and training. The policy implication would be the need to anticipate such long-term mismatches and adaptation of education policies to react to such shifts. Mismatches can also result from labour market rigidities, (such as dismissal laws that lead to reluctance to offer tenured positions) or be due to discrimination (Arrow, 1972; Phelps, 1972). There can also be regional mismatches, when local skill supply and demand do not match, and mobility or commuting is insufficient automatically to solve these imbalances.

3.2. Tools and approaches to skill needs assessment and anticipation

There is no single method of skills anticipation and matching. Several approaches and methods have been developed to identify skill needs, some of which are descriptive of the (recent) past and the current situation, while others are forward-looking. On the quantitative side, forward-looking approaches include systems which forecast skills supply and demand, usually through combination of the following quantitative forecasting methods: macroeconomic modelling of future development by economic sectors, extrapolation of the occupational structure within sectors, and a forecast of skill needs within occupations – usually by referring to qualifications (cf. Cedefop, ETF, ILO, 2016).

Most countries have anticipatory measures in place and others are building and developing systems for skills anticipation. Their common goal is to understand better the type of skills likely to be in demand in the future so that education and training programmes can be adjusted to align supply better with demand. To this end, knowledge and skills are required that match future changes in job contents in different occupations. Various activities, combining different methods and the efforts of many different institutions and projects, have been used in countries to understand current and future skills demand better. They

range from analysis of labour market trends, to analysis of gaps, and then policy responses such as fostering cooperation and interaction between firms and education and training institutions (usually technical vocational education and training (TVET) providers). Implementation of policy and practice, however, and programmes/actions to bridge the gaps identified in the results, remains the most difficult point.

BOX 1:
New developments in skills anticipation in selected countries

The project "Development of the workforce competence assessment system by sectors and regions" was implemented by the Bulgarian Industrial Association in the period 2009-2014, partnering with the Confederation of Independent Trade Unions in Bulgaria (CITUB) and the Confederation of Labour (Podkrepa). The project offers users an overview of available positions in sectors as well as the key competences and qualifications needed, so aiding job seeking and training/lifelong learning decisions. Each competence is linked to qualification levels of the national qualifications framework, while 'key jobs' per sector are also identified. The MyCompetence tool/platform was developed under the project, which allows for future analysis of trends, forecasts and research. The goal is to integrate MyCompetence with the e-government infrastructure.

A new forecasting and monitoring system is currently under development in Latvia. The State Employment Agency's (SEA) "Labour market forecasting and monitoring system development" is co-funded by the ESF for the programming period 2014-20. The SEA employment barometer is already available on an IT platform, making all relevant information available to the public. It is acknowledged that dissemination of information through the platform aims at facilitating and improving active labour market policies, relevant decisions and career planning.

Greece is developing a diagnostic system for assessing labour market needs in skills. All major social partners sit in the Scientific Committee, co-ordinated by the Department of Employment of the Ministry of Labour and Human Resources, and representing employer and employee organizations, along with government officials from the Ministries of Education and Labour and the public employment services (PES).

A good example of an integrated approach to skills anticipation in Brazil is a foresight model developed by SENAI. This model develops sectoral prospects at national level. It aims to capture industrial, technological and organizational change and the impacts on employment in order to anticipate future training and qualification needs. The process is managed by an executive group formed by SENAI technical

representatives, academia and business representatives, who are both producers and users of the information generated.

To draw industry engagement in the TVET reform project in Bangladesh, the establishment and operation of industry skills councils (ISCs) were included. These councils bring together major enterprises and industry bodies to provide specific advice on occupations and skills in demand and to identify key skills project priorities in their sectors. The ISCs operate as tripartite committees, involving representatives from employers, employees and government.

Countries in South-Eastern Europe used an innovative foresight approach to discuss and decide on their skills priorities up to 2020. The rationale for using foresight was to support policy makers to design more future-oriented, participatory and evidence-based policy approaches to skills development policies. Capacity to deliver and monitor comprehensive and longer term visions on skills development was also analysed.

Sources: Cedefop (2015) and European Commission (2015); ETF / Cedefop / ILO (2016b; 2016c); ETF (2016)

For a common picture, the individual elements should be analysed – at least in discussion of the results and their interpretation – taking information from other elements into account. For instance, a country's skills forecast can provide a broad and consistent picture of future skills needs, but to understand the individual problems of graduates finding employment or of firms with hard-to-fill vacancies, data from micro-level tracer studies and employer surveys could be incorporated into the skills anticipation system. Similarly, if there is interest in studying a particular sector, there may be a need to incorporate data or insights from sector studies that provide necessary detail of the specific skills needed within a particular occupation in that sector; this often adds details beyond normal statistical identification in general data. The regional (sub-national) dimension also cannot be ignored in many countries, especially in case of larger ones. Such studies also assist in translating national results into the local context. Given the differing economic structures across countries, future skills need can vary significantly from one territory to another. It may also be that local skills governance systems have an important role to play and can benefit from labour market intelligence. All of the above point to the need for a multifaceted, multiple method approach to skills anticipation. In practice, however, for a range of reasons (including cost, availability of resources and expertise), such an approach is not always feasible or practicable.

There are several elements to skills anticipation systems. Collecting and calculating adequate labour market and skill information, preferably in a dedicated LMI system (LMIS), is one element. The collaboration of various internal and external stakeholders in the process of generating the information, validating its findings, and disseminating the information through publication, education and labour market policy and other means are all important.

Nowadays, developed countries have systems and tools in place for making information on education and training opportunities publicly available, as well as systems/procedures to assess and anticipate skill needs. Many have become increasingly active in skill needs anticipation; it is now widely acknowledged that skills intelligence tools can serve multiple policy objectives and steer skills development and matching policy more effectively. Developing countries have also been active in providing and using skills anticipation tools and approaches, mostly focusing on qualitative and sectoral approaches.

Almost all countries use at least some basic form of LMIS to inform policy in the ministries that touch upon skills anticipation and labour market and education policy in general: the ministries of labour, education, and social affairs, and, particularly in developing countries, other line ministries such as agriculture, tourism, and industry. Often, statistical offices and PES contribute to labour market intelligence based on labour force surveys, household and census statistical surveys, and vacancy and job seeker data on the part of the PES. Sometimes this data can be enriched by qualitative information and appropriate administrative sources such as social insurance data, pension fund data, school enrolment and graduates.

3.2.1. Data

The development of statistical data, administrative data tracking, and the rules and regulations around the use or non-use of (combined) administrative and survey data govern the potential of LMI based on these sources. In Scandinavian countries, with large administrative data sources, which are sometimes easily combined with other, partially survey-based, data, very detailed insights into the process on the labour market are possible. Other countries are much more restrictive and do not easily allow the combination of various data sources, but can still generate important insights using the vast data infrastructure at their fingertips (as in the USA and Germany). The level of detail is often limited by the data-sources. Detailed decision making, such as on the skills content of TVET qualifications, is likely to need additional information; statistical classifications and surveys do not provide the low levels of disaggregation required. This should be understood in evaluating and combining the various approaches and methods in their roles in specific skills governance tasks.

The existence of reliable and consistent data sources, administrative or from surveys, is an important pillar of LMI, both in analysis discussed and also as input to more sophisticated tools.

A reliable and regular skills assessment requires regular updating of key data sources. Most statistical office data (labour force survey, household survey, census) are surveyed regularly. However, additional surveys are carried out, often outside of the realm of the statistical office: these can include graduate surveys or tracer studies, (sector-based) employer surveys, and working condition surveys. Where they exist, these surveys should be included in the overall data collection strategy.

Data should be representative of the current situation and preferably also retrospective to allow longitudinal analysis. Recent data allow the policy response to be relevant to the current situation, whereas longer time series allow better interpretation and understanding of trends. They are also necessary inputs if forward-looking quantitative models are to be developed.

The breakdown of the data determines the level at which it can be used in labour market analysis. If the data are national and not representative beyond that level, a sub-national analysis cannot be provided without further inputs. If the data do not allow us to identify the fields of study, for example, this

Box 2:
LMI and skills anticipation in the Netherlands

Skills assessment in the Netherlands includes various instruments and data sources, some based on surveys from statistical offices. Additional to these, (regular) surveys are conducted with graduates entering the labour market, as well as administrative data from PES, education ministry and social security insurance contributions. Various bodies and skills councils contribute qualitative (and additional quantitative) material to help understand detailed problems. Long and medium-term forecasting models assess skills imbalances by detailed occupation and qualification (combination of field and level) using survey data. There are also tracer studies of all major training programmes that elicit school-to-work transitions from recent graduates (one to two years after graduation). Several sector studies are also conducted within the same organization. The PES generate several short-term specific labour market forecasts and analyses, including of vacancies. Within sector councils, ministries and tripartite policy groups, labour market or education and training system responses are discussed and incorporated into recommendations.

Source: Authors

element of the qualification cannot be used in the analysis of skills. It is the variables or dimensions of the data, along with frequency, that determine to which degree, and in which areas the material could and should be used.

Table 2 summarizes some key data collection approaches in the context of LMI. The data requirement and technical expertise depend on institutional arrangements and the quality needed. Many primary data collection methods can be generated at sub-national or sectoral level to test methodology and setting in a smaller context, but also to build up local expertise in processing and analysis of results. Over time, such approaches could be extended to the national level to provide a more representative sample. This is especially helpful in countries which have little or no LMI infrastructure.

Each approach and instrument has its own strengths and weaknesses, summarized in Table 3 below. Note that here the approaches have been ordered more towards the goal and less in terms of a data collection instrument as in Table 2. This should also emphasize that the approach can also be part of the process of involving many actors in collecting evidence on skills, analysing the evidence, and then formulating policy recommendations.

Table 2 Methods and requirements

Instrument	Data Requirement	Technical Expertise
Qualitative methods	No specific data requirements	Technical expertise in qualitative methods is required Expertise in preparation of (structured) interviews, focus groups, Delphi methods, etc. Synthesizing qualitative outcomes often proves challenging in new contexts
Sector studies	Some data requirement (depending on methods used within sector): Sector based data from statistical surveys; employer-employee surveys, etc.	Technical expertise required: Understanding of sector based labour markets, occupations and skills requirements Analysis of primary and secondary data. If primary data has to be collected: survey methodology
Employer-employee surveys **Enterprise surveys**	None (primary data collection)	Survey design and conduct; (representativeness, weighting, questionnaire design, interviewer training) Analysis of survey outcomes Methods to ensure representativeness

Instrument	Data Requirement	Technical Expertise
Quantitative forecasting models	Reliable and consistent time series on labour markets (sector, occupation, qualification) and population (age, gender, labour market participation) is necessary	Expertise in building and running quantitative forecasting models requires statistical and programming experience Several years of experience (with a new model) is required to produce sensible analyses
Graduate surveys / Tracer studies	Primary data collection Tracer studies require the contact details of recent graduates. Additional administrative data from the education institutions can be used to enrich data	Survey design and conduct; (representativeness, weighting, questionnaire design, interviewer training) Analysis of survey outcomes Methods to ensure representativeness
Vacancy surveys	Primary data collection Vacancy surveys can either use (piggy back on) existing administrative data or processes of PES, or they can be conducted as employer surveys. Using administrative data requires adequate processes ensuring consistency and representativeness of data	Survey design and conduct; (representativeness, weighting, questionnaire design, interviewer training). Analysis of administrative data and survey outcomes Methods to ensure representativeness

Source: Authors

Table 3 Strength and weaknesses of LMI data

Approach	Advantages	Disadvantages
PRIMARY DATA COLLECTION (A)		
Surveys of fact (directed at employers (or other groups such as households) asking questions (for example) about employment levels, pay, unfilled vacancies, etc.)	Direct 'user/customer' involvement Focuses on how people behave not on what they say or perceive	May be problematic in getting responses Need large samples to get robust data, therefore may be expensive
Surveys of opinion (directed at employers (or other groups) asking questions (for example) about skill deficiencies & skill gaps)	Direct 'user/customer' involvement Allows more direct skills measuring	May be subjective and inconsistent May give too much focus on the marginal and ephemeral

Approach	Advantages	Disadvantages
Interviews and related techniques	May be able to address problems and concerns more subtly and in greater depth	May be unrepresentative
Workshops	Useful mechanism for exchanging views	Can provide a partial view
Other informal contacts	Useful mechanism for exchanging views	May be anecdotal and not grounded in reality
ANALYSIS (B)		
General synthesis and critical assessment of available evidence		
Formal, national level, quantitative model based projections (using econometric techniques or computable general equilibrium or similar models)	Comprehensive Consistent Transparent and explicit Quantitative	Data hungry Costly Not everything is quantifiable May give false impression of precision
Partial quantitative model-based projections (e.g. focusing on individual sectors or occupations),	Transparent and explicit Quantitative Targeted	Not everything is quantifiable May give false impression of precision Partial analysis may be biased
Other foresight methods		
Focus groups / round tables, Delphi style methods;	Holistic Direct 'user/customer' involvement	Can be non-systematic Can be inconsistent Can be subjective
Scenario development analysis **(Encompasses many different forms)**	Holistic Direct 'use/customer' involvement Focuses on uncertainty	Can be non-systematic Can be inconsistent Can be subjective
Sectoral/occupational/ regional (sub-national) studies and/or Observatories (using both quantitative and qualitative evidence)	Holistic (for the sector) Strong on sectoral and other specifics	Partial Potentially biased May introduce inconsistency across sectors

Notes: (a) This can include surveys of employers as well as surveys of households (b) This can include analysis of general administrative data sets which focus on the economy and the labour market (such as the national accounts, census of population), as well as many purpose-collected data sources (such as the UK national employer skills surveys and the US O*NET database).

Source: Kriechel et. al (2014)

3.3. Skills anticipation systems

Governance of a skills anticipation and matching system in a country is a complex and multifaceted arrangement. It typically involves a multitude of stakeholders, including government representatives, social partners, regional authorities, sectoral bodies, accreditation bodies, research institutions, TVET providers, public employment service offices, individuals, firms and dedicated institutional bodies and processes. There are also formal and ad-hoc coordination channels between the different stakeholders, along with a range of financial or other incentives that permeate the system.

Governance of skills anticipation systems includes all activities that develop and coordinate the measurement and analysis of skill needs, and validate the analysis with the help of actors that broadly represent the demand side (employers, potentially also the trade unions), the supply side (trade unions, education organizations), and 'institutions' regulating the market (ministries of labour and education, PES, local administration). The goal is to coordinate and develop economic and education policies to respond to the skill needs analysis.

Understanding the governance of skills anticipation systems means considering how various actors are likely to respond to different signals given out by the system and, for example, whether some of the incentives used to drive up participation in skills development are economically rational.[4]

The investment decision will vary according to the stage of learning: from compulsory schooling that is primarily the responsibility of the State, to a point where it is primarily the responsibility of the individual or the employer with regard to continuing vocational education and training.

Governance of skills systems involves many actors in various roles. There are ministries and administrations trying to identify challenges and formulate policy responses; education and training institutions, reacting to the policy responses and incentives in any given country and political system; PES attempting to identify measures to match skills supply and demand; unions and employer organizations attempting to influence the various actors on behalf of their constituents. Individuals might also be affected in their role as student, worker, or job seeker. All of these are or can be influenced by information about the labour market and its future developments.

[4] That individual actors do choose career paths reflecting the information on labour market conditions and their own preferences (personality traits) is shown for the Netherlands with strong LMI for graduates in Fouarge, D., Kriechel, B., & Dohmen, T. (2014). Occupational sorting of school graduates: The role of economic preferences. Journal of Economic Behavior & Organization, 106, 335-351.

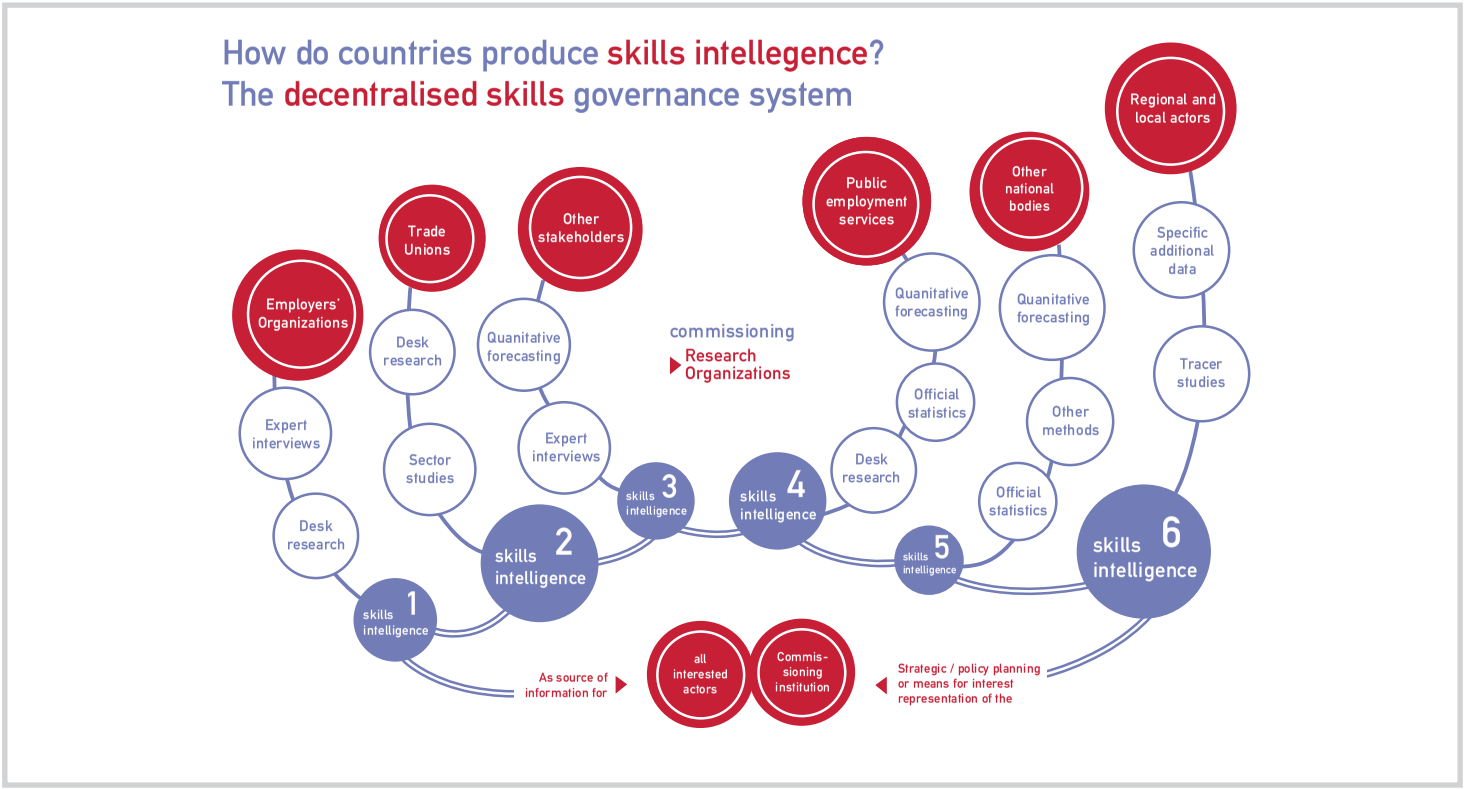
Labour market and skills information systems have several roles. They bring together labour market intelligence to inform employment policy in the widest sense. This includes guidance on how to respond to labour market mismatches by using employment and activation policy, the formulation of occupation standards, defining contents of continuous training and re-training and setting TVET standards by qualification; all of these are usually within the direct or indirect responsibility of the ministries of labour or education.

LMI also informs education and training policy in general. For example, current and future mismatches can be used in allocating the number of training or study places and the required course content and level in a country or region, all of which usually falls within the remit of the ministry of education. It also helps students in making informed choices on their qualifications. In some countries LMI is also used in the context of population and migration policy. In countries regulating immigration, identification of any shortage of occupations or skills in high demand can inform policy.

Ideally, a skills anticipation system includes the relevant policy and administrative levels (ministries, representatives of school / education organizations) as well as stakeholders. As a quantitative model it can offer methodology underpinning evidence-based policy, providing the necessary intelligence in the processes involved. It can also provide the means to formulate and enact agreed policy measures in their various forms. It includes a process of jointly analysing challenges and identifying issues that can be jointly addressed.

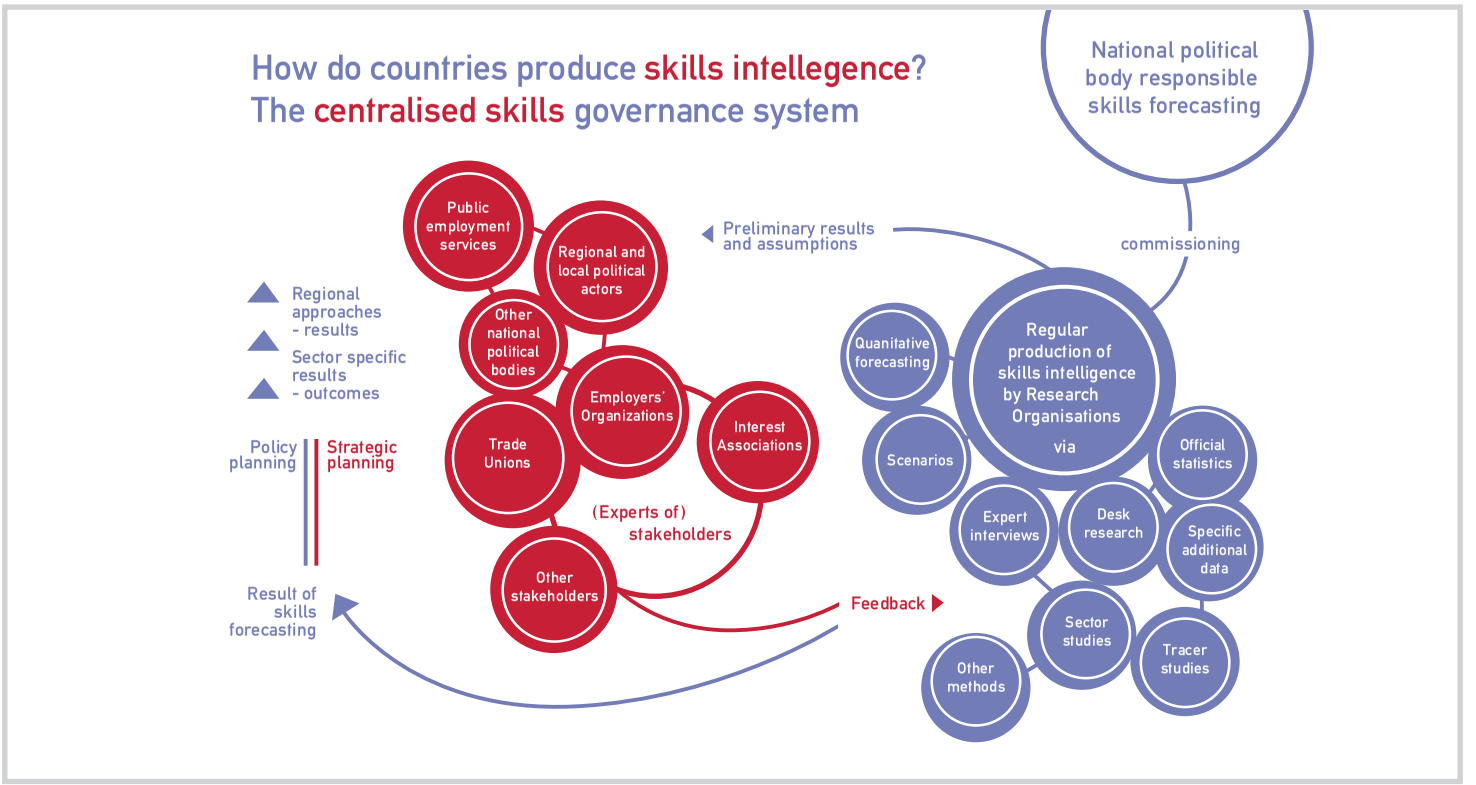
Figures 2 and 3 aim to stylize typical examples of multilevel approaches to skill anticipation; these are multilevel in the sense that a range of institutions and approaches are used to analyse and describe various aspects. Figure 2 depicts a country with a decentralized approach with often competing and overlapping methods and outcomes; Figure 3 offers a centralized approach. The exact use of approaches and main actors, as well as their responsibilities, may differ: the two figures only offer an insight into the various processes that need to take place. In the decentralized case, many organizations take responsibilities for various approaches to evaluating the labour market and potential mismatches. Some of these approaches might be repetitive or overlapping across several organizations, while others are only conducted by single organizations. The challenge in these setting is that there will be multiple outcomes with potential imbalances that might even contradict each other. Bringing together the various organizations to provide a (more) complete overview of the labour market situation is challenging. However, the competing results allow knowledgeable analysts to get a more diverse view of the various bottlenecks and skill imbalances of the labour market. This often allows for more differentiation and is more driven by the level at which information is needed.

Figure 2 **Multilevel approach to skill anticipation – decentralized**



Source: Authors; Sandra Singh (Graphic Designer).

Figure 3 **Multilevel approach to skill anticipation – centralized**



Source: Authors; Sandra Singh (Graphic Designer).

The centralized system of Figure 3 seems at first sight more manageable, as there is less duplication of effort and potentially more coordination among the various elements. However, such a system hinges on the involvement of the various internal and external stakeholders that might only have limited attachment to the instruments and processes of data collection.

Whether centralized or decentralized, the precondition for a well-functioning skills anticipation system is a good coordination across levels and actors. Stakeholder involvement is a key factor in successful systems. Including both administrative and policy levels in LMI process and analysis ensures continuous exchange between the analysis and the administrative processes. It allows general policy choices to be aligned with the challenges deriving from LMI analysis.

Extending the involvement of external stakeholders and sub-national level bodies is an important principle in skills anticipation. Generally, any stakeholder (representative) expected either to react to the key outcomes of labour market analysis, or with crucial insights into the mechanics of existing or future problems, should be included in analysing, discussing, and formulating policy responses or related proposals.

It is a challenge for the lead organization to ensure the consistent and continuous inclusion of key stakeholders from within and beyond the administrative bodies involved. The set-up is likely to differ in each country, as will discussion of themes and outcomes of selected methods. Table 4 provides an overview and examples of arrangements from several EU countries.

Table 4 Examples of mechanisms for dissemination and use of LMI via stakeholder cooperation in EU member States, 2015

Mechanism	Examples
National-level Training Councils or Commissions	Vocational Education and Training Council (LTU); National Vocational Education and Training Council (SVK); High-level coordination committee (EST); General Council (PRT); Accrediting Council (DEU); Standing Committee on New Skills (AUT); Inter-ministerial working group (CZE); Expert bodies for anticipation of skills and competences (FIN, IRL)

Mechanism	Examples
Sector qualifications and skills councils/ committees	Sectoral professional committees (LTU); Sectoral joint committees (ESP); Sector skills councils (GBR)
Sub-national or local councils	Local training committees (DNK); Country-level training and development committees (HUN); Regional competence assessment centres (BGR); Employment pacts (CZE); Regional advisory boards (AUT); Regional development agencies (HRV)
Other (consultation) bodies	Council for preparation and approval of occupational standards (SVN); Steering groups of National Qualification Frameworks Advisory Council for Labour Market Forecasting (LVA); Advisory boards of job and vocational training centres (PRT); Tripartite expert councils (e.g. LVA, FIN)

Notes: These examples of mechanisms and/or bodies of stakeholder cooperation in EU countries are not exhaustive.
Source: OECD-Cedefop-ETF-ILO (2014); European Commission (2015)

Transition and developing countries are establishing and testing similar mechanisms for LMI generation, dissemination and policy use, although local and sub-national cooperation mechanisms are less developed. For example, the Former Yugoslav Republic of Macedonia is setting up a skills observatory that would allow regular exchange of data related to skills demand and supply, interconnection of various institutions and organizations working in the area of skills development, and sharing data and information to wider public, via a dedicated web-portal (ETF 2016).

4. Implementation of skill anticipation and matching across the world

In the following section we present the results and responses of the survey. In section 4, we present what can be considered methods, approaches, and institutions, while section 5 concentrates on the governance aspects. All figures are based on the combined quantitative results of OECD-ETF-Cedefop-ILO surveys. The results of the qualitative survey are used in interpreting the findings.

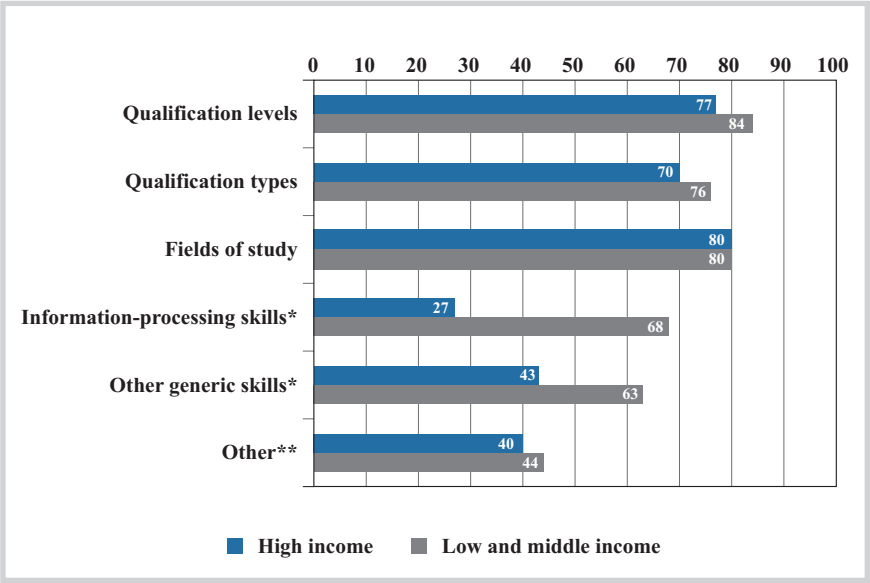
4.1. Measuring skill

One of the key issues in any skills anticipation and matching system is deciding which way of measuring of skills will be used. There is a fundamental tension between data and skills measurements within the data sources and those that decision makers in skill governance would like to see. Users of skills anticipation would like extensive and specific sets of skills to be included. However, as the measurement and collection of such data is both costly and methodologically complex, the use of proxies is common.

A standard approach is to use qualification as a proxy for skills. Qualification levels, types or fields of study provide manageable measurement of the actual skills used or required on the labour market. They also allow for direct translation into education policy in terms of education planning. Qualifications are also often identified in statistical data, although typically not with a level of detail that allows for detailed programme planning in education and training. They allow use of labour market analysis with quantitative evaluations and forecasting models. Usually qualifications are identified by their main 'level', such as low, intermediate, and high or some more specific identification of the different types of secondary and post-secondary education in a country. The education field is an important element as it determines the content that has been taught and, at least partially, an alignment with industry grouping. Other skills measurements can also be

Figure 4 Measuring skills used

(% of national ministries reporting use, aggregated by income groups)



* Answers were not applicable in the ETF questionnaire, therefore no information for Albania, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Serbia (% relate to all countries with the exception of ETF-countries) ** Includes category 'Other' and category 'Specific Skills', the latter was only included in questionnaires for ETF countries (Albania, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Serbia)

Source: Ministries of Labour, Ministries of Education questionnaire

used, if available. Occupations as proxy of (embodied) skill requirements are common. The identification or direct measurement of specific skills (as in PIAAC) is less common in more formalized national methods, but more common in narrower settings such as sector studies or occupation-specific skill needs studies.

Figure 4 shows the different approaches to quantifying skills nominated by the survey countries. While generic skills such as communication or ICT use are important, they are unlikely to be at the core of skills anticipation systems. If we evaluate all measurement types together, the most common approach involves qualifications classified by type, level and/or field of study. Only seven of the countries report not using qualifications in quantifying skills. Some countries use a variety of skills definitions ranging from qualifications to information processing and other generic skills. More than half of the countries use at least two of the three dimensions of the qualification categories. About nine out of 10 use at least one category of the qualification level.

Analysing the joint survey data by other categories reveals that, in OECD and EU countries, the field of study is reported to be the most important element, followed by the level and then by qualification type. In other countries, the qualification level becomes more important, followed by the field of study and the qualification type (TVET or other).

An alternative approach to using qualifications is to use occupations. Occupations are seen here as proxies for embodied skill requirements. This follows the assumptions that occupations are also identified by tasks and responsibilities involved and, often, qualification requirements. They can proxy information that would also be given by the set of qualification information discussed before. The answer category 'occupations' was, however, not introduced in the original survey tool of the OECD, but appeared in later surveys. In many countries, this simplifies identification in statistical data, as identifying qualification by fields and level generates a larger number of combined categories and complicates the labour market demand outcome in skill mismatch analyses.

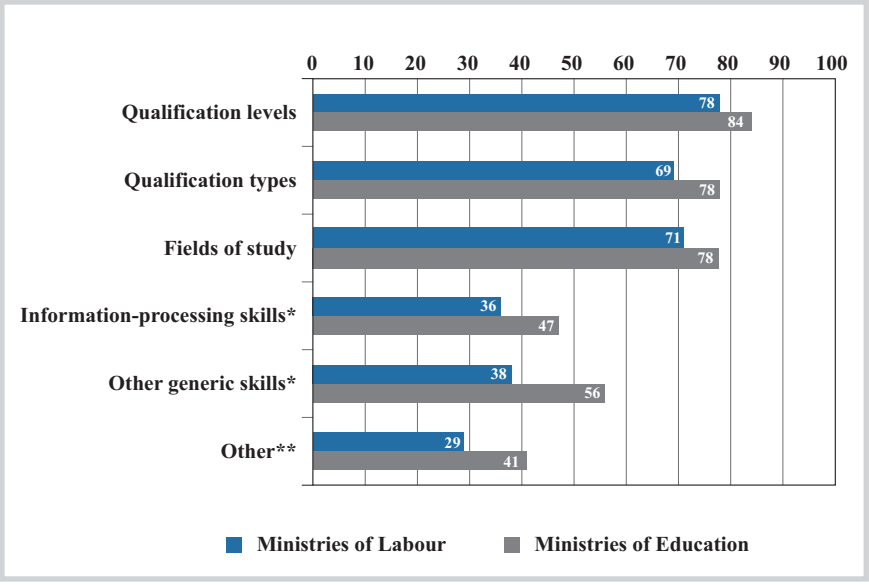
There do not seem to be great differences across different types of countries in quantitative information from the survey. Many variations in skills measurement are used, and both developed and developing countries use all forms of skills proxies. However, developing countries often report that skills identification is routinely done on qualification (or occupation proxies), while other skills measurements are only used in specific exercises, often by employer organizations or other stakeholders.

The reliance on information-processing and other generic skill measurement in developing countries is likely a result of specific programmes currently developing surveys or skills evaluation with respect to these issues. It is also, as we understand from the qualitative data, often included in consequence of development projects related to the concept. Rarely are there reliable and frequently updated data sources including information-processing or other generic skills.

Ministries of education tend to exhibit the widest use of different skills quantification. Different forms of qualification as a proxy for skills, often combined from level, type and field of study, play an important part in many ministry policy and administrative process roles.

Note that not all approaches are or can be included in the LMIS as many statistical systems do not include skills beyond their representation in qualifications or occupations. This is also likely to influence responses. In the ministries with key responsibility for education planning, formal qualifications play a central role in formulating policy goals because of data limitations. Additional

Figure 5 Measurement types used by ministries of labour and ministries of education (% of ministry respondents reporting use, aggregated by type of ministry)



* Answers were not applicable in the ETF questionnaire, therefore no information for Albania, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Serbia (% relate to all countries with the exception of ETF-countries) ** Includes category 'Other' and category 'Specific Skills', the latter was only included in questionnaires for ETF countries (Albania, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Serbia)

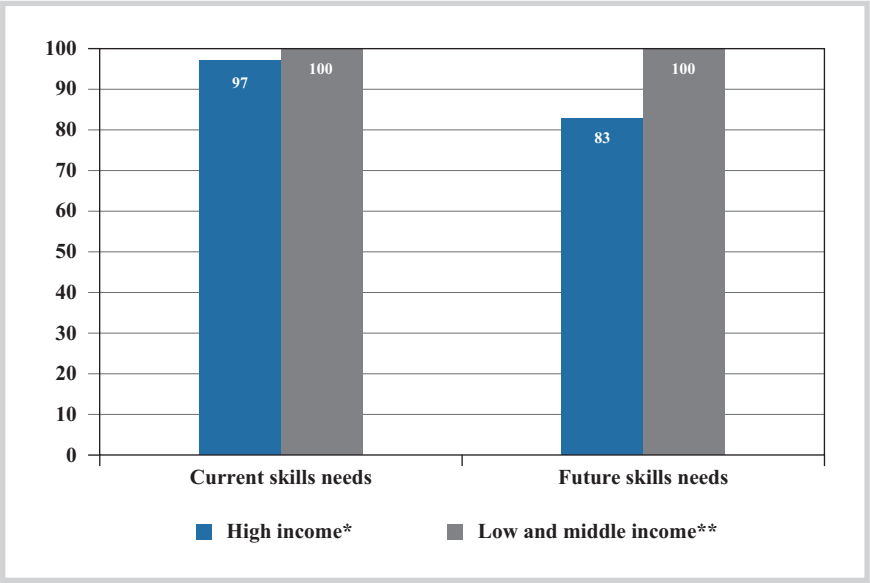
Source: Ministries of Labour, Ministries of Education questionnaire

approaches can only complement the centrality of qualifications in statistical based systems. However, the linkage between qualifications and skills is weak, especially if qualifications are used across different occupations and graduation cohorts. All measurement should be considered as complimentary and equally central.

4.2. Skills assessments and anticipation

A wide range of methods is used across countries when skills assessments or anticipation exercises are undertaken. More elaborate approaches or combinations of approaches tend to be used in higher income countries, while a wider variety of approaches is used within low and middle income countries. The frequency of skills assessments ranges from multiple times a year for analysis of existing statistics to annually or up to every five years for methods

Figure 6 Current or future skills considered
(% of national ministries reporting use, aggregated by income groups)



* No information for USA ** No information for Benin, Bangladesh, Brazil, Colombia, Egypt, Jamaica, Jordan, Cambodia, Madagascar, Mozambique, Malawi, Peru, El Salvador, Tunisia, Tanzania, Uganda, Zambia
Source: Ministries of Labour, Ministry of Education questionnaire

that are repeated consistently. Many countries also report that all or most of the methods are not updated frequently. Just as consistent updating of key statistical data improves the use and understanding of underlying processes on the labour market, consistent and repeated skills assessment or skills assessment tools improve use and acceptance of their outcomes.

Figure 6 illustrates the distribution of current and forward-looking skills assessment in high income versus low and middle income countries. Skills anticipation tools and approaches used are geared not only to understanding current skills needs, but also towards future needs. Low and middle income countries that provided answers to the survey relevant questions report using both current and forward-looking methods. Skills anticipation, using either regular quantitative skills forecasting systems, or qualitative approaches, also dominate approaches to skills anticipation. This makes sense as any projection needs to be grounded in a good analysis of the past and current labour market situation, including this aspect. In addition, future-oriented methods usually require good data, preferably collected over a longer time.

4.3. Institutional arrangements

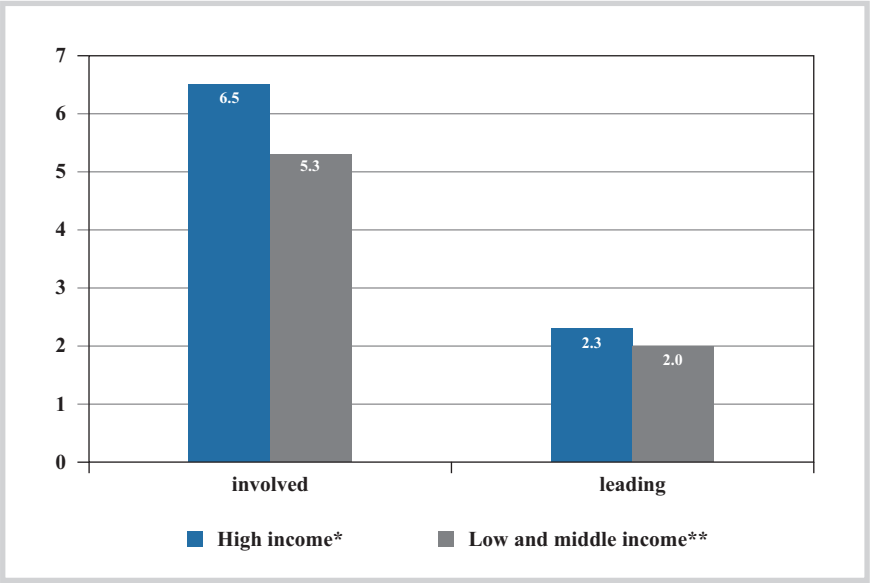
In every country, the organization that takes the lead in skills anticipation systems will depend on the TVET and skills system governance arrangements. The survey found that a wide range of organizations take the lead: the Ministry of Labour, the Ministry of Education, the ministry in charge of migration, the Ministry of Finance, the Ministry of Environment, other line ministries, the central bank, the statistical office, regional (sub-national) development agencies, regional and local governments, PES, private employment agencies, special observatories, universities, research organizations or think tanks, employer organizations or individual employers, trade unions, professional associations, and/or sector skills councils. In all cases at least one ministry was involved, and the number of participating institutions was fairly equally distributed across most of the country groups. The involvement of a large number of organizations can, in itself, be the cause of the set-up, a reflection of the state of development of the system, or simply the size of the country.

Both the width and depth of the skills needs anticipation system, as measured by the number and type of institutions involved, is important. Figure 7 summarizes the number of organizations reported to be involved in each exercise, represented as the average number of organization by the country groups. The size of the country and the spread of institutions can necessitate a larger group of organizations being involved. On average, the higher-income countries report a slightly higher number of organizations involved, although there was a higher number reported if more respondents were interviewed.

Figure 8 gives an overview of what is considered to be the 'lead' organization in the skills anticipation system. Again we distinguish by country groups according to per capita income. The ministry of education and the ministry of labour are lead agencies in skills anticipation (as be expected given their role on the labour market and in education policy, central to their roles in government). However, in high income countries, having the ministry of education as lead is much less frequent than in low and middle income countries, perhaps reflecting greater adjustment between skills development and employment in these countries. Low and middle income countries also have a greater tendency for multiple organizations leading. In high income countries, external organizations or the ministry of labour are more likely to take the lead. In low and middle income countries, employer organizations often also play a leading role in skills development and analysis. Here they usually evaluate and counterbalance other stakeholders rather than take the lead.

Other important organizations that sometimes play lead roles, but with comparable frequencies across all countries, are sector councils, PES, statistical

Figure 7 Number of institutions involved in skills assessment / anticipation exercises by income group (Average number of institutions involved)



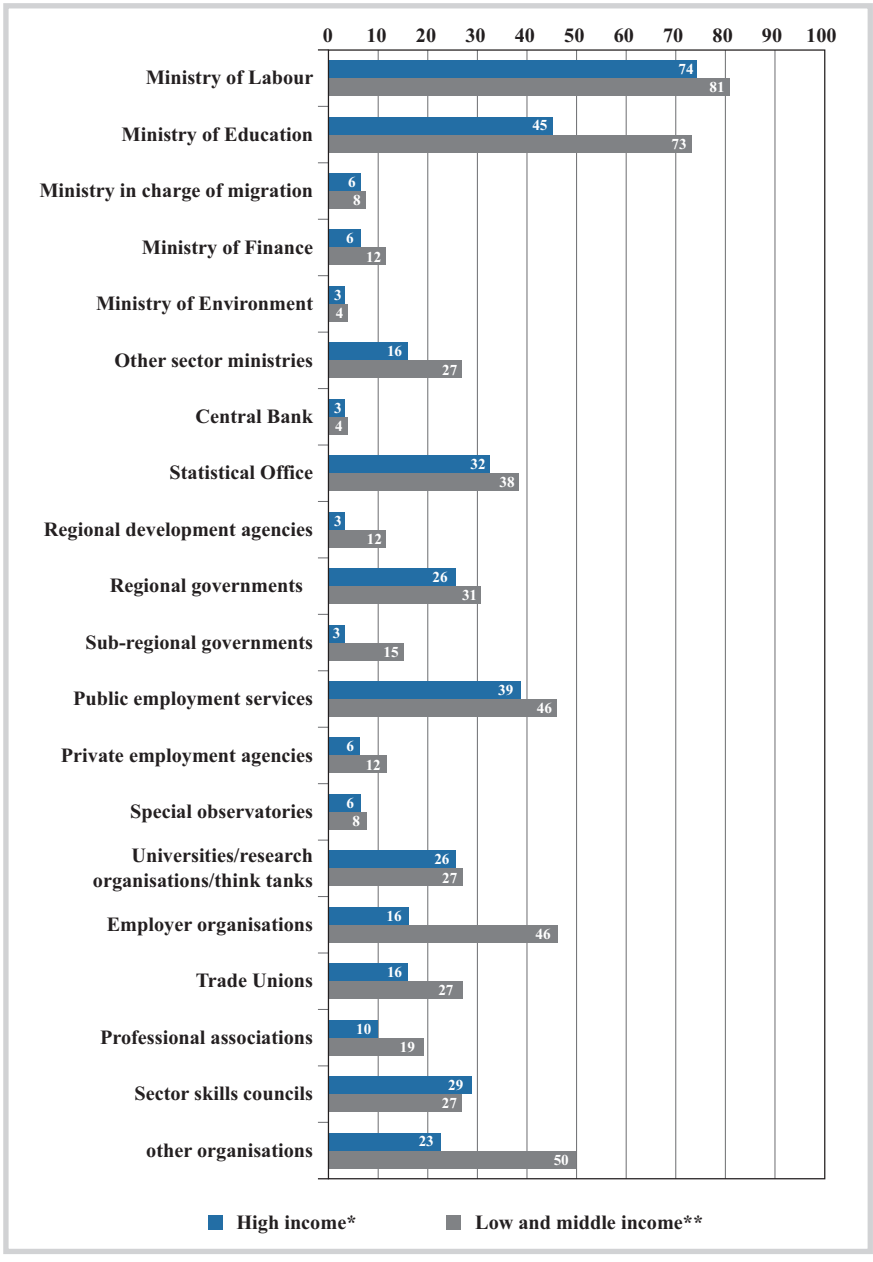
* No information Greece ** No information for Benin

Source: Ministries of Labour, Ministries of Education, employers' association, trade union, and other stakeholders' questionnaire

offices, and universities or independent research organizations. Most of these organizations have some expertise in skills analyses. Sector councils usually benefit from sector specific knowledge and their key connecting role between labour markets and the education and training sector, bringing together various stakeholders with a sectoral approach. PES collect (local) LMI on vacancies and job seekers sometimes they also initiate or control access to retraining. Statistical offices collect and process all statistical data in a country, so they have an advantage when it comes to steering the contents and the analysis of the LMI at hand. Universities and independent research organizations often have the necessary technical skill, through staff that already analyse labour markets, and also the advantage of relative independence from ministries and other stakeholders.

In high income countries, where relatively fewer institutions are involved, the ministry of labour usually leads, with statistical offices, sector skills councils and (university) research organizations playing a leading role. In countries with many institutions involved, stakeholder organizations such as the trade unions and employer organizations also have a major role.

Figure 8 Organization leading skills assessment / anticipation
(% of national constituents reporting specific organization as leading in skills assessment/anticipation, aggregated by income groups)



* No information for Greece, Italy ** No information for Benin, Egypt
Source: Ministries of Labour, Ministries of Education, employers' association, trade union, and other stakeholders questionnaire

In low and middle income countries, the ministry of education is more often involved in leading skills anticipation than in high income countries. The likelihood of this involvement diminishes, when relatively fewer organizations are participating in the exercise. Approximately two thirds of the countries with five or fewer organizations involved see the Ministry of Education at least as one of the lead organizations in the assessment exercise. Important other organizations for the group of countries having only a limited group of partners are the PES, the statistical offices, and regional (sub-national) governments. As the number of participating organization increases, more countries mention also sector skills councils, trade unions and employer organizations, and professional organizations as helping lead in skills anticipation.

The OECD (2016) defines the leading role to be either a centralistic one, a non-centralistic one, or it can be some mixed form. A centralistic approach involves being organized by or with close involvement of the government, which ensures the relevance of the exercise to the ministry and its effect on policy development. The non-centralistic approach puts more or less independent organizations at the centre of the exercise, usually at arms-length to the government. This can ensure increased credibility in terms of independence relative to direct lead by government agencies or ministries. Neither system is intrinsically inferior or superior as they have their respective advantages and disadvantages.

4.4. Level of analysis: national, sub-national or sectoral approaches

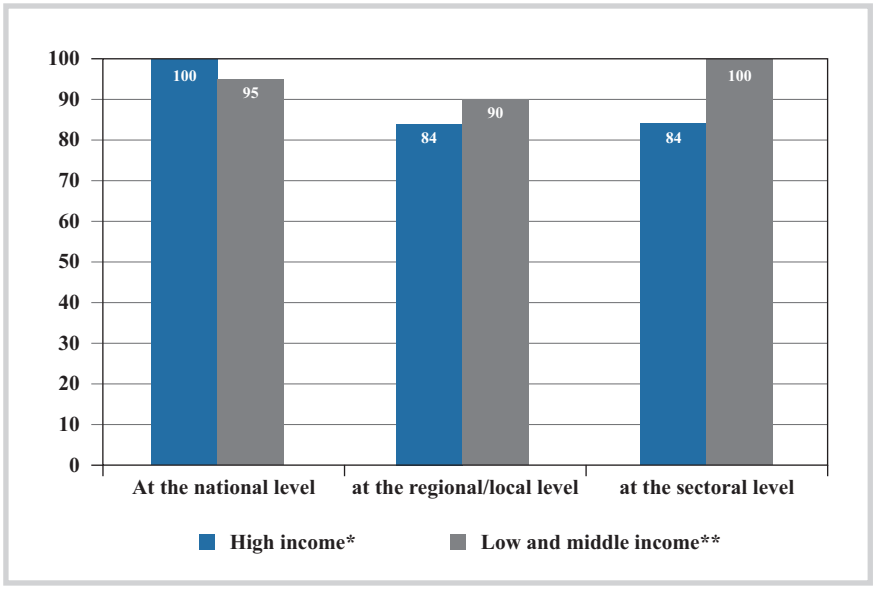
Skills anticipation and labour market assessments can be organized around sub-national,[5] national and/or sectoral approaches. Almost all countries report undertaking skills assessments at national level, as Figure 9 shows. There is often also a sub-national and sometimes a sectoral assessment.[6]

Ministry representatives from the participating countries differ in their view of which is the most important administrative level for skills assessments, forecast, or foresight exercises. Some African country representatives (Madagascar, Malawi, Mozambique, and Zambia) stated that the national level is the

[5] In order to avoid confusion with cross-border and regional approaches, we use the gradations national, sub-national, and local. This deviates somewhat from the questionnaire where sub-national was often denoted as 'regional'.

[6] Note here that the question seems to have been interpreted by respondents to include all dimensions that one may give to any skills assessment exercise. Sometimes 'national' was chosen as well as the regional approach, which was deemed representative of the national case. Or 'regional' is indicated, because the underlying data also allow us to add the dimension of regions (while it is not done in the current skills assessment).

Figure 9 Implementation of skills assessments by administrative level
(% of national constituents reporting implementation at the respective level, aggregated by income groups)



* No information for Malta ** No information for Albania, Benin, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Serbia
Source: Ministries of Labour, Ministry of Education, employers' association, trade union, and other stakeholders' questionnaire

most important. This might be because the skills governance system is still evolving, with the first step being the implementation of exercises at national level. Jamaica also stated that the national level is most important, which is a reasonable approach for smaller and less populated states. Other smaller countries (Cyprus, Malta, Latvia, Slovenia and South East European countries) also identified the national level as being most important.

Some countries stressed the importance of (additional) sectoral and/or local exercises, including larger countries like Brazil, Colombia, Egypt, Peru, and Tanzania. This is not necessarily due to population, as this list also includes less populated countries like Benin, El Salvador, or Tunisia. Representatives from Jordan and Uganda described the sectoral level as most important.

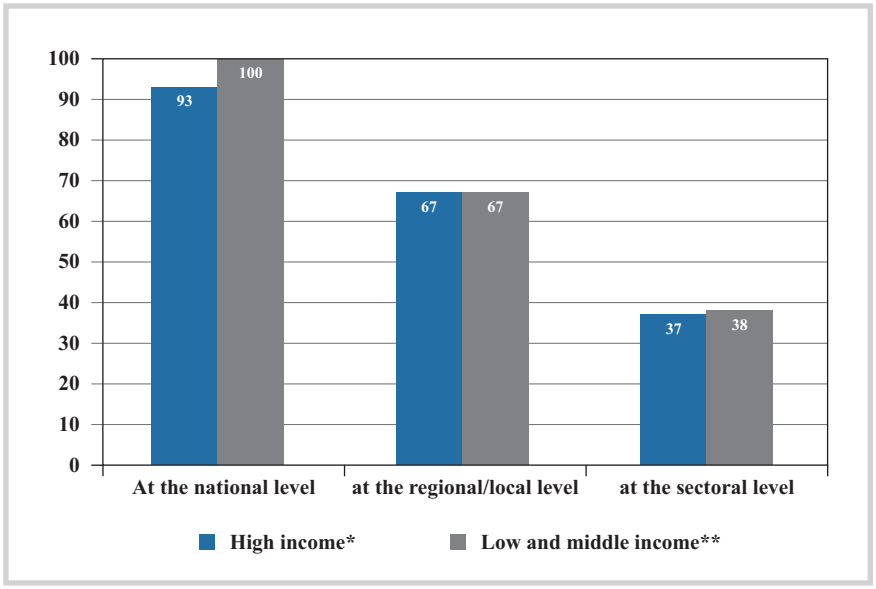
There can also be a distinction based on progress in the techniques or methods used. In France, Italy and Sweden, national level exercises are most advanced. In Romania, both the national and sub-national ones are assessed as most advanced.

According to ministry representatives from Austria, Denmark and Ireland, the national and the sector level are the most important for carrying out these exercises. In Belgium, sectoral and sub-national exercises are assessed as the most important.

Sectoral approaches are especially important if skills demand differs significantly across sectors and/or if a sector has a strong influence on the overall economy of a country or a region. Sectoral approaches are also preferable if industry skills councils or other sectoral bodies are active in the skills system and if there is a government strategy that targets particular sectors for promoting growth, trade and investment. Huge differences in the skill demand across sectors can occur with different forms of production and organizations of work within a country. While more traditional skills might be demanded in many sectors, high-tech sectors might be competing on the world market and demand up-to-date skills in relevant qualifications or occupations. It is especially in technology and at the sector level that the shortcomings of statistical classifications are often criticized. While many surveys can only collect information on the main field of study, such as engineering or possibly electrical engineering, this identification may not necessarily cover the specific demand from sub-sectors and individual enterprises. Employers usually search for very strong specializations in the field to avoid retraining a hired engineer to reach an appropriate job level. Similar challenges occur in the ICT sector, where computer programmers might be skilled in several computer languages with experience in building applications but companies or the sector need specific applications and programming languages. These detailed skills are almost never included in statistical skills anticipation data; often more granular data can only come from qualitative discussions with sector specialists and stakeholders that make it possible to include these specific skill shortages.

Depending on the type of skills anticipation exercise undertaken, some countries see all levels as important. In Hungary, the local level is most important for assessing education and training outcomes, the national level is the most important for current demand, and the sector level for foresight exercises. In Finland, national level exercises are used to design a general framework of action, while sectoral and sub-national exercises are used for policy planning. While Lithuanian responses assessed all levels as important, the country lacks exercises carried out systematically at the national level. Similarly, in Croatia, the national level is assessed as very important but skills level assessment exercises are carried out at sub-national and sectoral levels. While the national level is the most important in Latvia according to one respondent, the importance of comprehensive networks and institutional mechanisms was mentioned by another Latvian respondent.

Figure 10 Administrative levels involved in the discussion of findings
(% of national ministries reporting that discussion of findings takes place at the respective level, aggregated by income groups)



* No information for Australia, Greece, Sweden ** No information for Benin
Source: Ministries of Labour, Ministries of Education questionnaire

A Slovakian respondent assesses the sector level as the most important. In Estonia, exercises are carried out at sector level while the national level is the result of sectoral aggregation. Portugal plans to refocus its activities from national and sectoral levels more to the regional and local. The survey highlights different perspectives held by different stakeholders in an LMI system.

There is also a more dynamic reason to include sub-national or sectoral dimensions; this is especially the case when developing new skills assessment approaches, or expanding the LMI system. Emphasizing key regions and concentrating on priority (and/or growth) sectors usually produces a better result and stimulates stakeholder engagement more than in sectors or regions that are reluctant to participate or do not have pressing skill issues. As tools under development need significant input from various stakeholders, a cooperative work environment in which the region or the sector has something to gain, and has some experience in formulating their skill needs, can benefit from commencing skills assessment.

Good skills assessments should place skills evaluation in the economic domain where the skills are used (adopt a sectoral approach). Particularly in larger

countries, labour markets are regionally separated, so an additional sub-national approach is helpful in understanding regional discrepancies within a country. Even if a country is small, and could in principle be considered an integrated labour market, a large proportion of the workers may be less mobile than regional distances might suggest. For example, research in the Netherlands showed that the commuting distance of workers increases by qualification level, and that at the intermediate level a large share of the workforce will not commute (or move) above a 50km distance.

4.4.1. Stakeholder participation

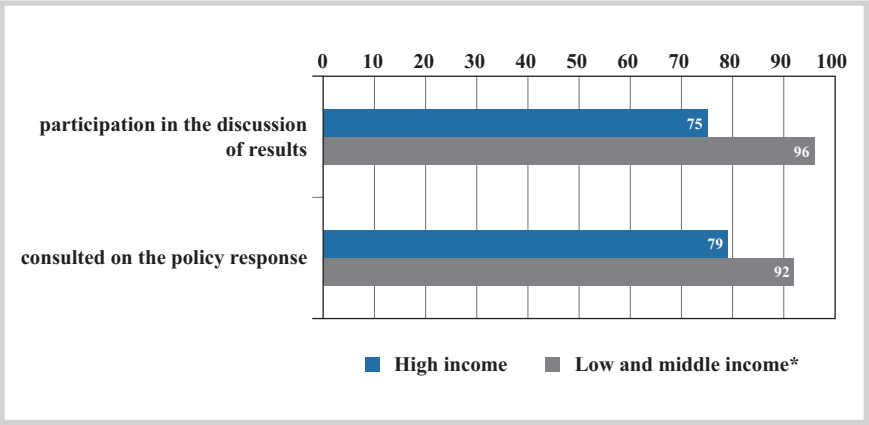
The survey indicates that external stakeholders are often included in skills assessment. In some cases they may initiate or lead the process but they most frequently play the role of outcomes evaluator, discussant and sparring partner of those, mostly governmental organizations, taking the lead.

Figure 11 summarizes the stakeholder involvement as reported by employer and worker organizations. In high income countries the involvement reported is less: only three-quarters of these countries involve these stakeholders in discussing the results and only a few more consult them in formulating policy responses. In low and middle income countries the stakeholders are more often reported to be involved in discussions on results and policy response formulation. Both values are higher in these countries than in high income countries, which usually have more developed skills assessment and anticipation systems.

One explanation may be that stakeholders in low and middle income countries are involved more often in the discussion but are less likely to have formal power in the process. Many qualitative interviews (particularly from the stakeholders in low and low-middle income countries) report that stakeholders are often involved in this process without being granted significant influence on the outcome (both in discussing the results and in formulating policies). These cases of ‘stifled voices’ can inhibit cooperation and lead to withdrawal from the coordination platforms intended for analyses and discussion. In these countries, development partners are also likely to be an important element in the analysis and discussion of the results.

The involvement of employer and worker organizations is mostly at national or sectoral level. At the sectoral level, stakeholders usually show their expertise as many employer and trade unions are organized by sector. They can then provide valuable inputs in explaining the outcomes of a skills assessment or adding additional qualitative inputs that can go beyond statistical analysis.

Figure 11 Participation of employers, trade unions, and other stakeholders in discussion of findings with the government
(% of national stakeholders reporting that discussion of findings takes place, aggregated by income groups)



* No information for Benin and Turkey
Source: Employers' association, trade union, and other stakeholders' questionnaire

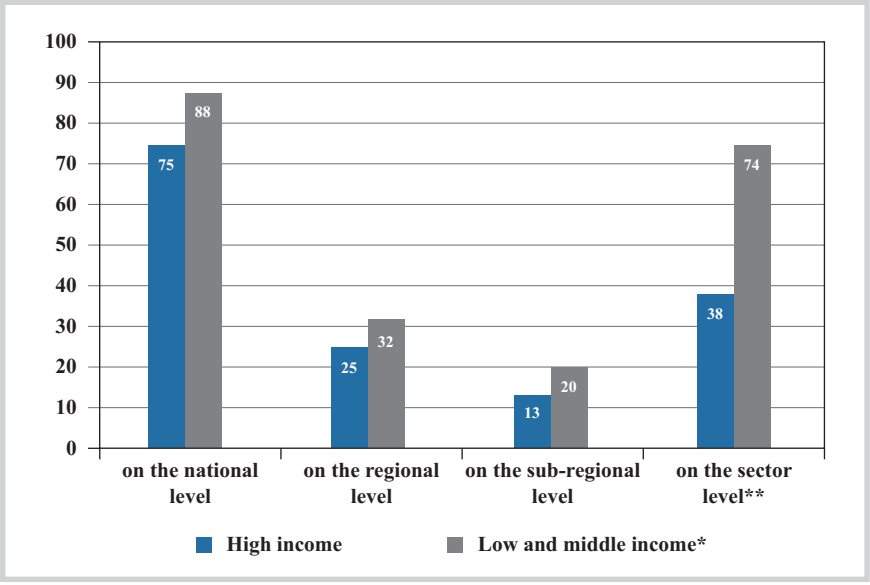
However, especially among stakeholders, responses to the open questions imply that stakeholders often feel that they lack the manpower and technical expertise to provide inputs beyond national (and sector) level. Only in countries that have clear territorial governance mechanisms and/or are very large (such as Brazil) can we expect stakeholders to have adequate size and resources to provide inputs at a sub-nation level.

As Figure 12 shows, involvement of employer and worker organizations is strongest at national level, reported by more than 80% of countries. Stakeholder participation at sectoral level is also strong, reported by more than half of the countries, with low and middle income nations reporting involvement much more often than other countries. This can also be the result of skills assessment exercises in those countries being built around certain key sectors, not involving all parts of the economy.

Stakeholder involvement seems to function well in some developing countries. In Bangladesh, the National Skill Development Corporation includes the expertise of employer organizations and trade unions in the sample skills demand survey. The same is true for Tanzania and Uganda, where these organizations are involved in discussing survey results and, in the case of employers, also providing input.

Figure 12 Participation of employers, trade unions, and other stakeholders – levels of coordination

(% of national stakeholders reporting that coordination is carried out at the respective level, aggregated by income groups)



* No information for Benin and Turkey ** Answers were not applicable in the ETF questionnaire, therefore no information for Albania, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Serbia (% relate to all countries with the exception of ETF-countries)
Source: Employers' association, trade union, and other stakeholders' questionnaire

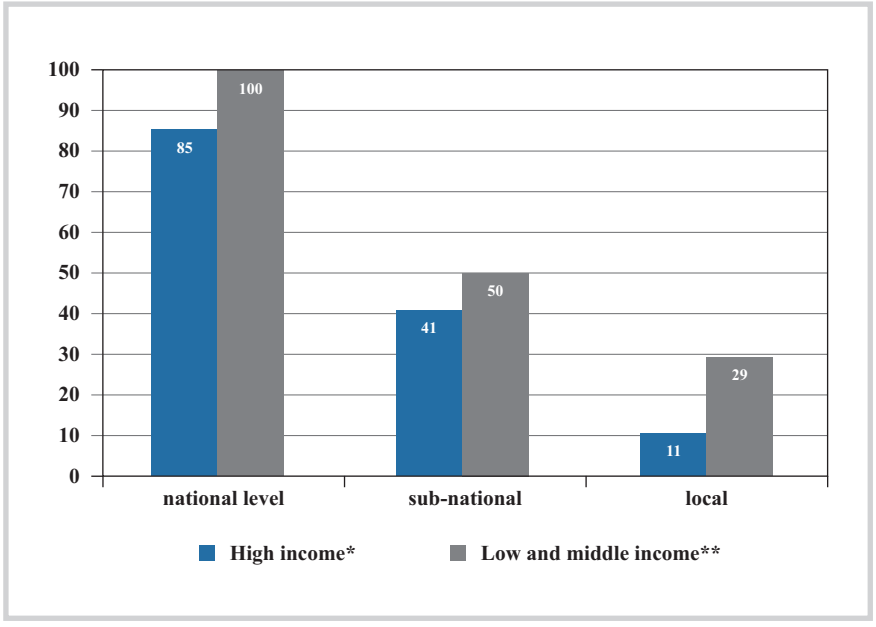
In some countries, constituents wished to be included more in the regular exercises. Employer organizations in Jamaica, for example, criticized lack of involvement in a labour market technical advisory committee. In Peru, an employer organization representative stated that the organization would like to participate more directly in the consultative commissions Agroideas and Procompite. Involvement of trade unions seems to be limited to exercises carried out in specific sectors. External stakeholders often also help to validate findings rather than being directly involved in data collection and analysis.

The survey results also identify countries where one constituent is involved (usually employer organizations), while another (trade unions) feels excluded. In Colombia, for example, trade unions criticized their insufficient involvement. However, it could be, as is the case of SENA (the National Training Service), that they are involved in sector roundtables. In Jordan, employer organizations stated that they are involved in all regular exercises while trade

unions criticized the lack of stakeholder communication and involvement. Similar concerns were expressed in Peru and Tunisia, where unions were not consulted despite the fact that employers were. In Brazil, an employer organization conducts its own exercises as it is not involved with other institutions. The same is true for Brazilian trade unions.

Beyond discussing skills assessment outcomes, policy and programme responses need to be developed and implemented. This often involves several organizations, including regional or local administrative units and public and private training organizations. Inclusion of sub-national and local administrative organizations in formulating policy responses is more likely in larger countries, or in federally organized countries with more independent regions. Figure 13 shows the responses to this question by country groups according to the per-capita income level. Almost half the countries report developing a national policy response together with sub-national administrative units.

Figure 13 **Developing national response – administrative level involved.**
(% of national ministries reporting that the respective level is involved in developing a national response to skills needs, aggregated by income groups)

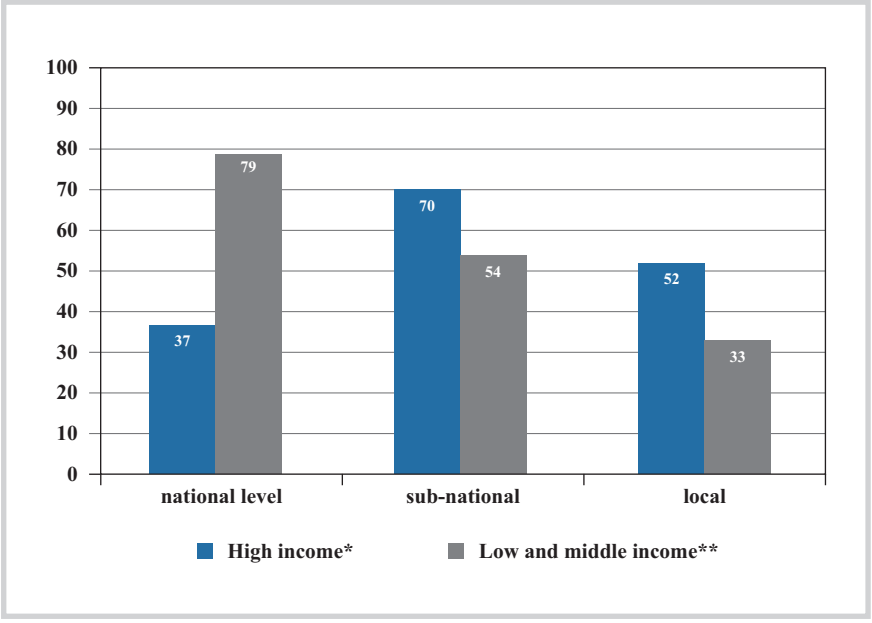


* No information for Australia, Greece, Sweden ** No information for Benin
Source: Ministries of Labour, Ministries of Education questionnaire

The sub-national policy response can also be formulated jointly from the various levels: national, sub-national and local. As Figure 14 shows, developing a local response is frequently delegated to the lower sub-national level. The higher income countries show a strong preference for delegating to the sub-national level: these countries seem to have adequate capacity to develop such a response. Only about four out of ten of the high income countries formulate local policy responses at the national level, whereas about eight out of ten low and low-middle income countries tend to.

Among low and middle income countries, local responses are usually developed at national and sub-national levels, and only one third state that they are developed (also) at the local level. Knowing that one of the main obstacles to translating insights from the skills assessment into policy responses is the lack of technical capacity, especially beyond the national level, it is perhaps expected that the sub-national level is usually involved.

Figure 14 **Developing local response – administrative level involved by income groups**
(% of national ministries reporting that the respective level is involved in developing a local response to skills needs, aggregated by income groups)



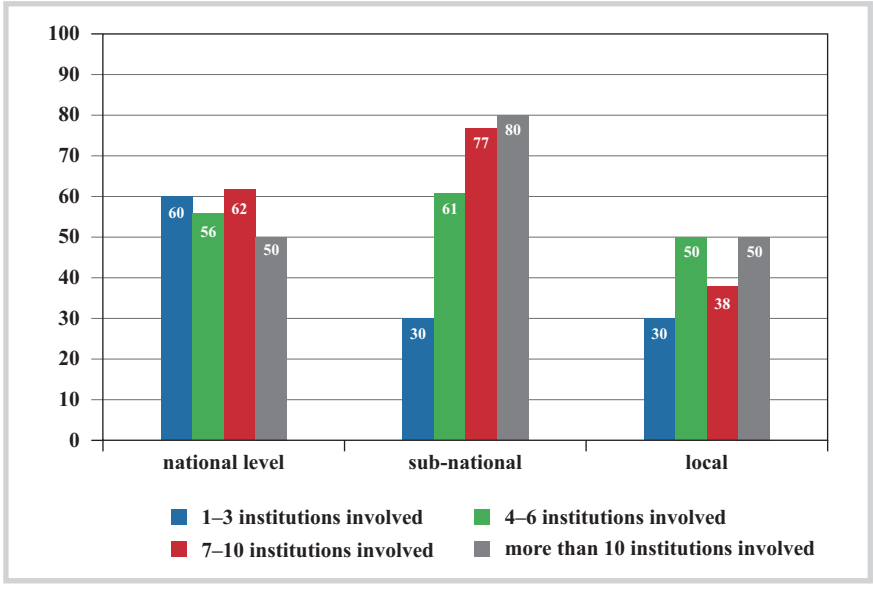
* No information for Australia, Greece, Sweden ** No information for Benin
Source: Ministries of Labour, Ministries of Education questionnaire

The level of involvement of various administrative units also rises with the share of institutions involved in skills assessments. As Figure 15 illustrates, the chances of having national, sub-national, and local involvement in developing local responses rises with the size of the network. This is in itself not causal, but rather the size of the network could result from an initial intention to include many administrative levels, which again increases the number of organizations involved.

In Bangladesh, involvement of regional or local levels is a responsibility of the National Skill Development Council (NSDC) through development committee meetings. Maintaining and ensuring communication with, and participation by regional and local authorities is the main challenge for the NSDC. According to the NSDC, prompt action and contact worked well.

In Egypt, involvement of the local and regional administrative levels is limited as the Industrial Training Council (ITC), has only recently started to open

Figure 15 Developing local response – administrative level involved by number of institutions involved
(% of national ministries reporting that the respective level is involved in developing a local response to skills needs, aggregated by the average number of institutions involved, multiple answers possible)



* No information for Australia, Greece, Sweden ** No information for Benin
Source: Ministries of Labour, Ministries of Education questionnaire

regional offices. The Ministry of Education, however, has contact with local and regional level actors to get information about efficiency of the education system.

In Colombia, there has been so far no cooperation or coordination with regional and local administrative levels. According to the Ministry of Labour, the establishment of a common language and definitions of competences are needed before this can occur.

In Jamaica, meetings with regional and local actors take place monthly, and quarterly Labour Market Information Technical Advisory Committee meetings work well. Information dissemination and sharing represents the greatest challenge, while the documentation of policy, procedures and work plans seems effective.

The involvement of local and regional actors in Jordan is limited because of staff shortages. There are internal meetings at administrative levels and the results are reported to the lead minister, policy is then commissioned and approved by the Council of Ministers. However, it is challenging to reach all parts of the country. Implementation is often too slow and the policy consequently not as relevant as when devised.

In Madagascar, regular meetings are held between central and regional authorities. The latter also participate in monitoring and administration of tools, a task they perform well according to a ministry representative. Their efforts are challenged by lack of funds. In Malawi, involvement of the local and regional level is limited as these administrative levels have a high level of autonomy. According to the Ministry of Labour, this is a challenge for coordination as the national level often has no influence on the sub-national level. Regional actors are involved in quarterly sector working group meetings; and local input comes through contact with the Labour Commissioner via social dialogue, but their regular contributions cannot be guaranteed.

In Mozambique, the Ministry of Education organizes local meetings and working visits to the field. Time and financial constraints are challenging for the involvement of regional and local actors, but participation in and organization of meetings is reported as working well.

In Peru, the national level releases technical assistance programmes for regional governments with the aim of improving skills standardization and certification. According to the Ministry of Labour, implementation and monitoring of these programmes is effective. However, regional authority staff shortage is a challenge to participation in national skills governance.

Tanzania has labour and employment offices in each region. There are also district education officers for coordinating basic education. Officials of these authorities participate in annual meetings that provide a platform for coordination and cooperation with national level authorities. The Vocational Education and Training Authority (VETA) regulates and coordinates TVET in the country. Although participation of different administrative levels in policy formulation and coordination/oversight of sector specific interventions at regional/district levels is good, according to the ministries, the current institutional arrangement lacks a regulation that clarifies leadership to support the required coordination/collaboration and so participation is often ad hoc.

In Tunisia, sub-national levels are involved via regional departments of vocational training and employment offices. They are mostly involved in data collection. There is, however, no regulatory or legal framework for involving sub-national interests in the country.

Respondents from South Eastern European countries pointed to problematic issues such as coordination mechanisms, ability to get meaningful involvement in these exercises (due, for example, to insufficient capacity) and a perceived lack of flexibility in policy planning at sub-national level in response to emerging skills needs (ETF, 2016).

In Uganda, sub-national administrative authorities can participate in interministerial committees and in the Uganda Local Government Association of skills assessment. There is also a Ministry of Local Government representing them. But sub-national participation is hindered because there is no clear policy framework and because of bureaucratic rigidities. Furthermore, the involvement of (sub-) regional authorities in Uganda is limited due to personnel and time constraints. Efforts are made to involve sub-national administrative levels in skills governance; for example, the Ministry of Education and Sports has decentralized primary education but TVET is centralized.

As Brazilian regions are very heterogeneous, their involvement and the reasons for it differ. Sub-national actors are part of regular working groups and tripartite commissions that interact with the Ministry of Labour, but the ministry sees regional and local involvement as challenged by discontinuity (such as high staff and contact person turnover) due to politics. According to the Ministry of Education, some regions' participation is also limited because of staff shortages.

5. From skills analysis to policy

In some situations the bodies or units in agencies responsible for skills assessments are separate from those responsible for decision making and resource allocation. Well-executed and informed skills assessments may have little impact on decision making. Analysing skills assessments and transferring insights from these assessments into policy poses a big challenge. It usually requires a wide range of actions, some within policy maker reach (such as education and training policies), and some well beyond with regard to influencing stakeholders to participate in activities that help to overcome or prevent mismatches. It also typically involves the coordination of several administrative levels across policy domains that together form the various layers of education and local labour market policy.

In itself, the outcomes affect several policy domains: usually these are within the Ministry of Labour, setting labour market policies including active labour market policies, and the Ministry of Education, setting education budgets, qualification skills requirements, and often (re-) training programmes. However, given that many line ministries are also involved in delivering education and training programmes, especially in developing countries, ministries with jurisdiction in areas such as agriculture, tourism, youth/women, and industry can also be involved.

There is consequently a risk of coordination failure. Skill governance should be inclusive and involve key players in the TVET and skills system. Often, not all groups are present in the skills anticipation system coordinating meetings, or they might lack the influence in these meetings to make their voice heard. Where coordination is a challenge because of such exclusions, either in voice or in presence, it can undermine the process of translating LMI into useful policy.

No system is perfect and all skills governance systems will face coordination challenges to some extent, preventing the LMIS either being fully developed or its information effectively used by the widest range of users.

5.1. Main use of skills assessments in policy making

Representatives from ministries of employment were asked to indicate whether skills assessments were used for policy purposes. Responses were based on a list to be found in the questionnaire which included 15 policy objectives mainly linked to labour market issues (including design incentives such as tax breaks and subsidies for workers or employers) and/or activities that employment ministries or organizations under their auspices run in many member States (including revising/developing new on-the-job training programmes). Representatives of ministries of education were able to choose from a list of 21 policy areas within their policy field and responsibility.

Analysis by country groups of responses from these two lists produced the data in the figures below. It should be noted that the responses only reflect the current approach, not how successful they judged the use of the skills assessment.

BOX 3:
Collaboration among internal stakeholders in developing countries

In Bangladesh, the National Skills Development Council (NSDC) takes the lead in collaboration, but other ministries (Ministry of Expatriate Welfare and Overseas Employment, Ministry of Labour and Employment, Ministry of Education, Ministry of Women, Ministry of Youth, Ministry of Industry, Ministry of Social Welfare) also participate: they are invited to meetings to exchange opinions, provide administrative and financial support, and develop policy responses. This has produced mixed results: not all ministries attend and representatives from some are not always at the level of seniority that allow deep understanding of the issues discussed.

In other countries (Brazil, Colombia, Jamaica, Jordan, Madagascar, Malawi, Mozambique, Tanzania, Uganda, Zambia, Tunisia), a range of political institutions is involved in discussions or/and in the formulation of a policy response, often depending on the matter under discussion. Sometimes there seems to be no clear-cut leading institution in the process, as respondents mentioned different institutions that (are supposed to) lead the process. This suggests there are issues with coordination and leadership.

In Egypt, no ministry takes the leadership in the collaboration process. In Peru, the Ministry of Labour is willing to include other institutions in the discussion of results but, according to the survey, had yet to do so.

In El Salvador, by law there is an institution responsible for ministry coordination (INSAFORP), but in practice there is no such coordination.

Source: Analysis of qualitative answers to ILO questionnaires

In the following two subsections, the use of skills assessments for labour market and skills policies will be considered. Dissemination of results will also be discussed.

5.1.1. Labour market policy

The ministries of labour in the countries surveyed mainly use skills assessment and anticipation to update occupational standards, define apprenticeship training programmes, design or revise training programmes – either for retraining or as continuous on-the-job training – and to provide information for developing training provision incentives.

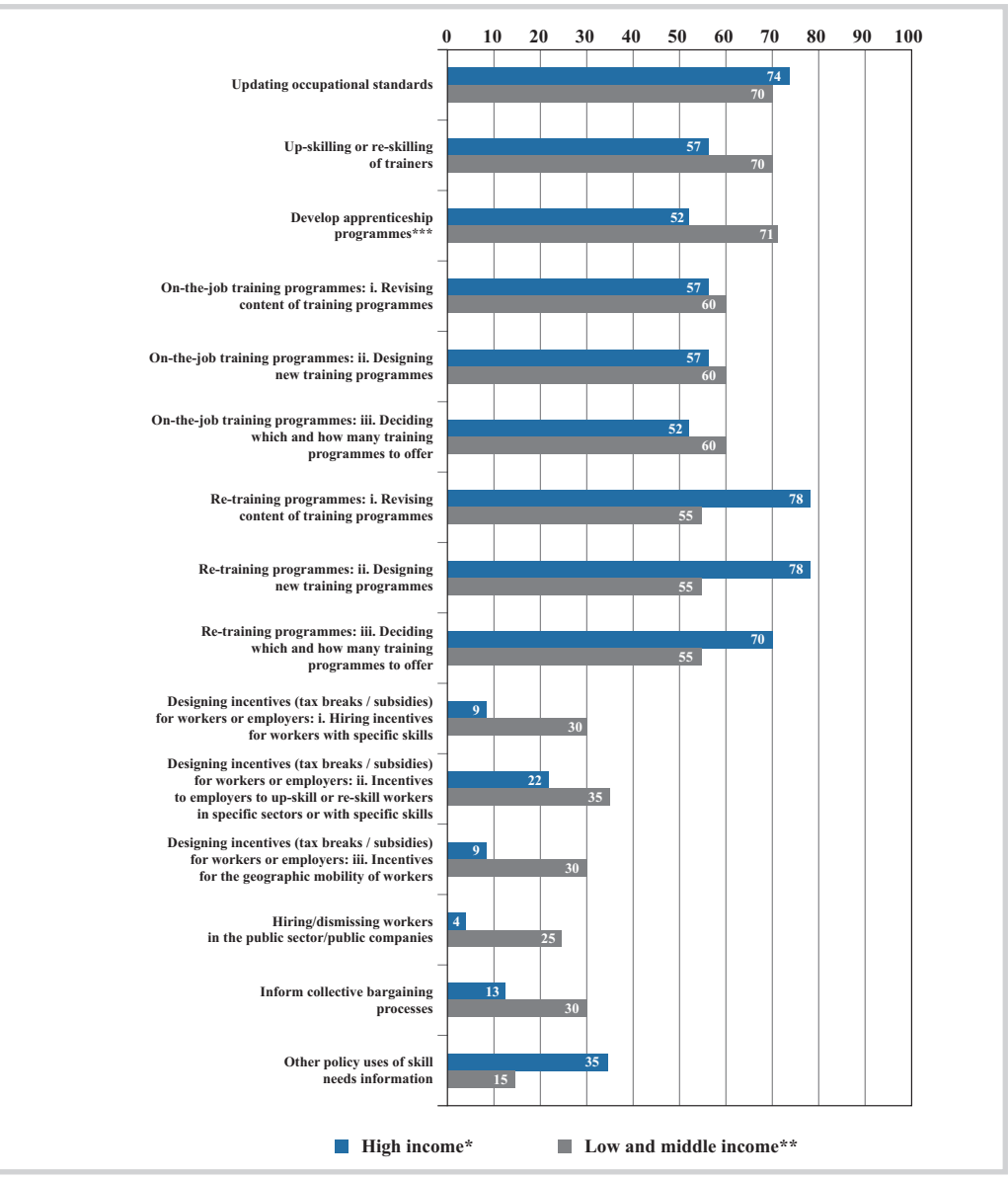
As can be seen in Figure 16, the most common use is in updating occupational standards and related material to include new insights into the skill set of those training new apprentices or retraining current workers.

Following occupational standards, apprenticeship programmes were most likely to be (re-) defined using the skills assessment outcomes.

Evidence from skills assessments can feed into various job training elements (both on the job and training programmes for jobs) in defining the content and number of existing or newly designed programmes. To a lesser degree the evidence also feeds into incentive instruments that steer individuals or organizations into addressing upcoming changes to required skills.

While the relative use of these elements is roughly similar in all country types, looking at the various country groups reveals some differences. High income countries seem to rely more on institutionalized systems of review and other institutional processes to incorporate current developments into occupational standards and training. The lower influence on re-training in low and middle

Figure 16 **Use of skills assessment – Ministry of Labour**
(% of national ministries of labour reporting use, aggregated by income groups)



* No information for Cyprus, Greece, Hungary, Ireland, Italy, Lithuania, Sweden ** No information for Benin, Brazil, Romania, Turkey, Uganda *** Answer was not applicable in the ETF questionnaire, therefore no information for Albania, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Serbia (% relate to all countries with the exception of ETF-countries)
Source: Ministries of Labour questionnaire

income countries might be due to the lower importance that this training has in those countries or, more likely, a greater degree of fragmentation amongst systems of planning and delivery. Low income countries report using tax incentives more extensively to achieve the skills and employment outcomes. Across the countries, more emphasis is put by ministries of labour on training of trainers than by other ministries.

BOX 4:
Application of skills anticipation and assessment information to updating competency standards and active labour market policy measures

Many governments use information from skills assessment and anticipation exercises to update occupational standards or to design or revise retraining programmes for workers or the unemployed. For instance, in Chile, governments use regional labour market statistics to define competencies and key activities for each occupation. These occupational profiles are then used to determine entry requirements and develop training plans for the National Employment and Training Service programme (Servicio Nacional de Capacitación y Empleo, SENCE) – a public agency that subsidizes training for workers and registered unemployed.

In Japan, vocational training is offered to workers who plan to change jobs or upgrade their skills to meet local labour market needs, as determined by skills assessments and forecasts carried out by the public employment service and the Ministry of Labour, Health and Welfare. PES in Belgium (both Flanders and Wallonia) also actively guide training of the unemployed towards occupations identified as in shortage. Similarly, Austria's public employment service (Arbesitsmarketservice, AMS) has a Standing Committee on New Skills, which gives specialist groups and social partners an opportunity to shape on-the-job training and retraining programmes by identifying short- to medium-term skills needs.

In Albania skills needs analyses feed into planning of training and retraining programmes for jobseekers. Montenegro and Serbia carry out regular employers' surveys to study labour market dynamics and expected changes in demand for occupations and skills, including from sectoral and sub-national perspectives. Findings inform policies aimed at job and skills matching, particularly the planning of training in certain occupations identified as in demand and for certain categories of jobseekers, such as vulnerable groups.

Sources: OECD (2016), *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264252073-en; ETF (2016)

5.1.2. Education policy

Ministries of education mainly use the results of skills assessments in developing qualifications, curricula and career guidance. Funding in upper-secondary TVET is most dependent on the results of skills assessments, followed by post-secondary non-tertiary training. These are much more dependent on the outcomes than short-cycle tertiary education (ISCED 5), or post-graduate level training (ISCED 7). A similar pattern can be found in upskilling of trainers and teachers; again influenced by the skills assessment outcomes in upper-secondary vocational education and training, whereas higher level education is reported to be less influenced (Figure 17).

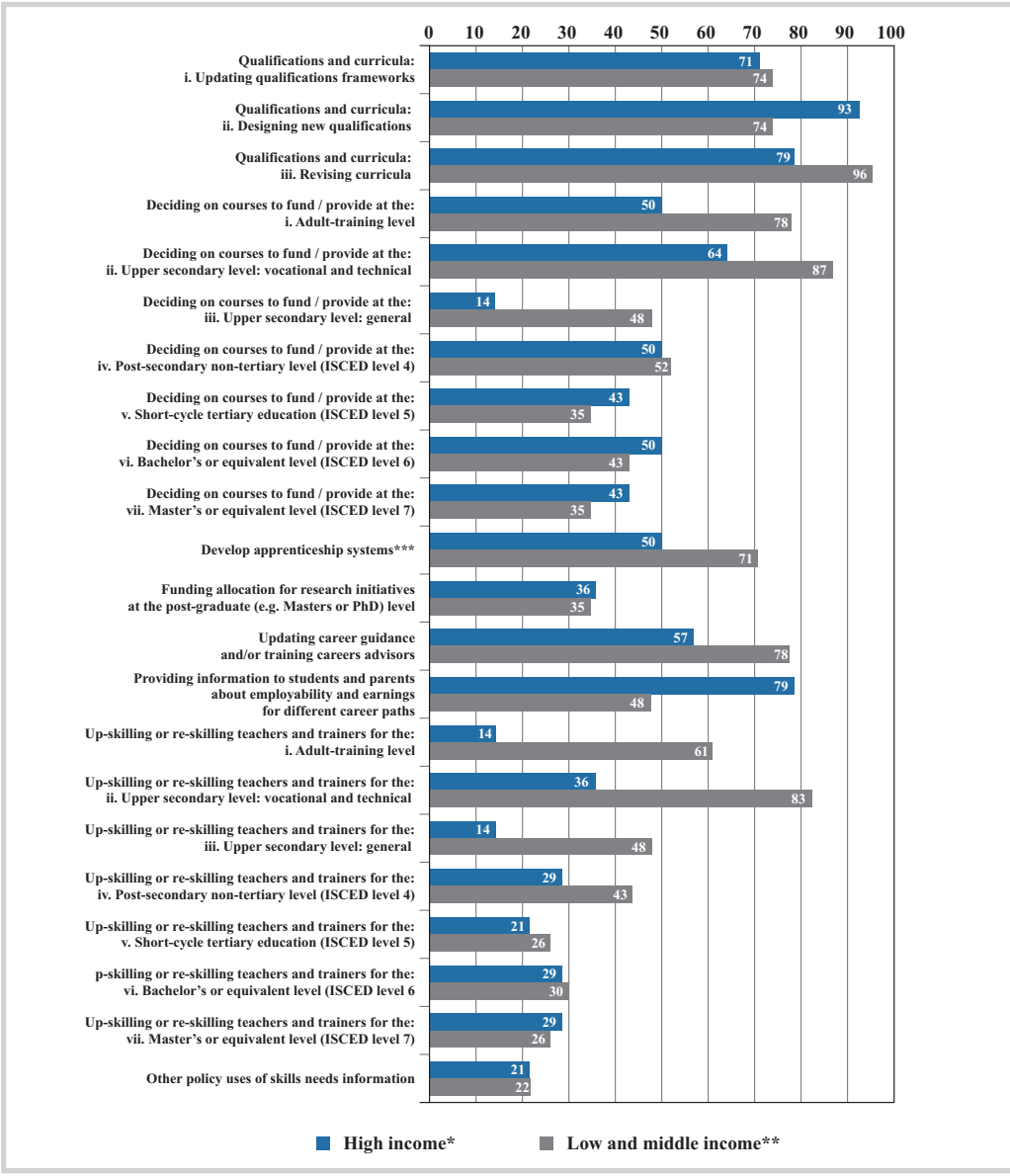
Comparing across country groups, we can see a similar general pattern in the responses of the Ministry of Education and the Ministry of Labour. While high income states generally score highly in these elements, this is not restricted to

BOX 5:
Application of skill anticipation and assessment exercise information to education policy

In most OECD countries, information from skills assessment and anticipation exercises is used to design new academic qualifications, to revise curricula, or to decide which courses to fund or provide at post-secondary education level. In Norway, for example, the decision to introduce a lifelong skills development strategy in science, technology, engineering and mathematics (STEM) in 2006 was prompted by evidence that the number and skills level of graduates from these fields was low. Demand forecasts produced by Statistics Sweden are used by Swedish higher education institutions to plan the number of spots to make available for each academic programme. Similarly, in Estonia, decisions about how many students to permit in vocational education and training and adult training programmes are informed by skills needs forecasts, employment outcomes of graduates and input from other ministries and social partners. The Estonian government also allocates funds to universities based on the predicted need for specialists with given skill sets. In many countries LMI is also made available to students and workers to help inform them in their education choices. For instance, Finland recently launched a web-based system, *ForeAmmatti*, which allows users to browse information on vacancies, local labour supply and demand, and skills needed for particular occupations.

Sources: OECD (2016), *Getting Skills Right: Assessing and Anticipating Changing Skill Needs,* OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264252073-en

Figure 17 Use of skills assessment – Ministry of Education
(% of national ministries of education reporting use, aggregated by income groups)



* No information for Australia, Canada, Czech Republic, Denmark, Estonia, France, Greece, Japan, Korea, the Netherlands, Poland, Slovakia, Slovenia, Sweden, Switzerland, USA ** No information for Benin and Colombia *** Answer was not applicable in the ETF questionnaire, therefore no information for Albania, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Serbia (% relate to all countries with the exception of ETF-countries)

Source: Ministries of Education questionnaire

high income countries. However, in high income countries, the influence on new courses is much stronger than on new qualifications. In middle and, especially, lower income countries, the impact of skills assessments is greatest on programmes to upskill or reskill teachers and trainers and to update curricula, rather than introducing new ones.

This mirrors somewhat our assessment of the expanded data set: countries with strong institutions and well-established systems of skills anticipation are reported to be affected less in their policy by skills anticipation than in countries where the skills assessment model is less evolved or developed. This hints towards other elements of education policy being influenced by several sources that together provide a full picture of what is needed, as well as perhaps by greater autonomy at institutional level. The skills assessment is just one of many pillars that anchor and inform education and training policy.

5.2. Social partners and other stakeholders and dissemination of results

A final group that is crucial in skills anticipation system governance is the social partners, key actors in labour market and education policy. They should be able to react in a coordinated way towards skills assessments outcomes, and coordinate in some form choices and insights into skills formation or usage. Other important stakeholders are associations of education organizations, chambers of commerce and research institutions. This list is by no means exhaustive; in each country different groups or organizations involved with skills might be usefully considered a stakeholder.

Stakeholder involvement is a challenge, especially if the skills assessment has been designed and initiated without their, at least partial, involvement. Invitations to cooperate and comment on results, discussion on potential policies and actions can lead to fruitful and long-lasting cooperation in which stakeholder insights can be integrated into the process.

Each stakeholder organization will have its own specific interest in participating. It will have its own views and preferences, and, in the worst case, will also bring old prejudices and fights with government or other stakeholders into meetings. The more cooperative the institutions and stakeholders are, the easier it is to develop useful modes of continuing cooperation to implement the results of the assessment. The less cooperative the environment, the harder it will be, especially if mutual trust is lacking. In many cases, survey results show that ministries leading a skills assessment were quite positive about the

discussions and the outcomes, while other stakeholders could be quite harsh in their judgement about the process, their influence, and the discussions.

This should not imply that a lead organization should allow the stakeholders to influence unduly the outcomes and analysis, but it should consider clarifying the expectations of the participants: what is expected of them and what is being done with their input. Ideally they should also manage a long term perspective on the potential for mutual gain and how it can be achieved.

In many countries (including Bangladesh, Colombia, Egypt, Malawi, Peru, Tanzania, Uganda, Zambia), social partners are included in skills anticipation. In some, the type or degree of involvement is criticized, while in others social partners take a more active role. In Jamaica, employers develop occupational standards and trade unions update and propose training activities. In some countries the involvement can be more indirect, as in Tanzania, where social partners are represented in the governing boards of institutions that deliver training. In El Salvador, some skills assessments, as with FOMILENIO, are developed jointly. This project was implemented to identify new needs of vocational training in the territories in which the interventions of FOMILENIO are implemented. However, the information from these exercises is not systematized and there is no coordination mechanism to articulate between institutions and other private and public providers. An employers' organization in El Salvador stated that it does not use skills intelligence information.

BOX 6:
Skills assessment in Bangladesh

The National Skill Development Council (NSDC) in Bangladesh plays the lead role in skills assessment, and initiated a skills demand survey in 2012. Other constituents (ministries, employer organizations, trade unions) were involved in the discussion and consultation process. Meetings of constituents are also organized by NSDC. Information acquired on skills demand is used for identifying skills shortages and occupational standard development, though only on a limited scale. According to the Ministry of Education, policy responses to skills assessment results do not yet take place in a systematic manner. According to a trade union respondent, discussions were only held at the national level, as the NSDC itself was comparatively new at the moment of the survey. The trade union wished to be included more in NSDC activity and to use the results to promote skills among their members. Before the introduction of the NSDC, the Employers' Association and the Ministry of Expatriate Welfare and Overseas Employment carried out similar exercises in 2007 and 2003. The ministries in Bangladesh stressed the importance of NSDC and industry skills councils as well as the need for stakeholder involvement and sufficient funding to

ensure a functioning skills anticipation system that translates into policy. Employers' and workers' respondents stated the need to involve employers and sector-based trade unions in the skills assessment process more rigorously at all levels.

Source: Analysis of qualitative answers to ILO questionnaires

In all countries trade unions and employer associations are usually the most likely stakeholders to be involved in skills assessments. They are usually large or strong enough to provide some analysis of skills and labour markets from the view of their constituents, while they are often also the initiators of specific methods (employee surveys, employer surveys) that allow for analysis based on several sources. For example, the Montenegro Employers' Federation and Chamber of Commerce regularly survey their members on skills' shortages and training needs; social partners are involved in decision making through sectoral councils. (ETF 2016)

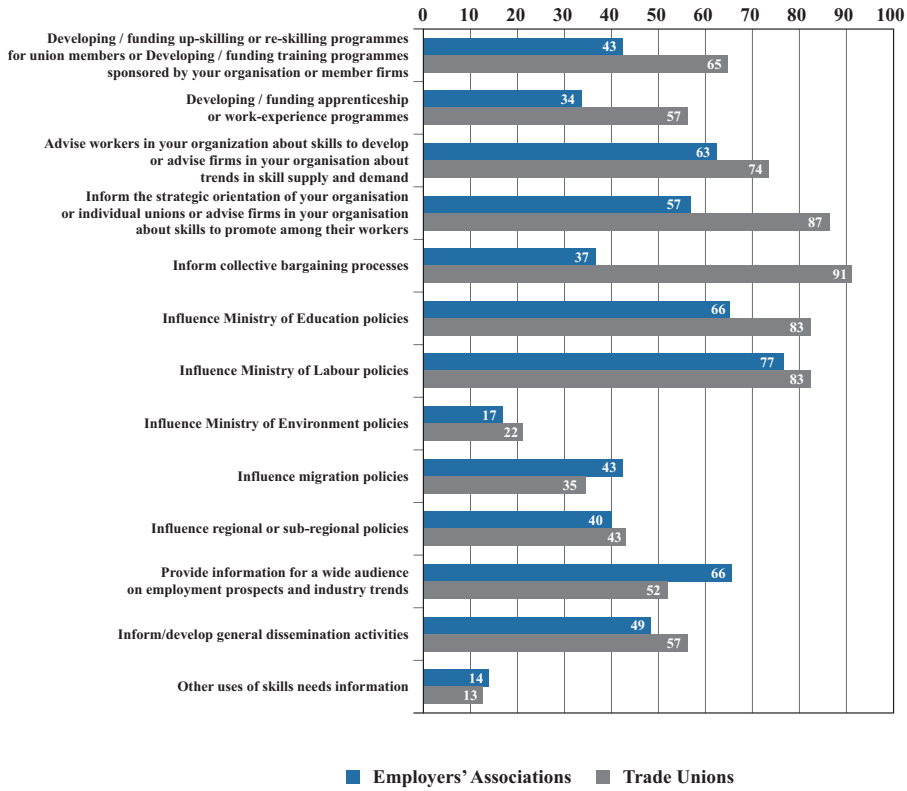
The survey tried to identify key stakeholders and incorporate their responses. In their answers concerning their use of the skills assessment (Figure 18) we can see the role that they attribute to themselves.

In many countries (including Bangladesh, Colombia, Benin, Jamaica, Jordan, Madagascar, Mozambique, Peru, Tanzania, Uganda), tripartite committees were set up to enable collaboration with stakeholders. Egypt has initiatives that aim at developing partnerships between government, employers and social partners (TVET programme), though this is also criticized as being unsuccessful by some of the stakeholders. The success of these committees and platforms seems to be mixed, from the stakeholders' criticism on the degree and depth of their involvement.

A key aspect for employers' and workers' organizations is the representation of their constituents' interests. Influencing the Ministry of Labour or Education is high on the agenda of both. Using the results to inform collective bargaining is high on the trade unions' agenda but much less important to employers' associations.

Employers' associations also tend to use the skills assessment to inform their own associations and members on future strategies, to disseminate relevant information within organizations about skills development and to inform the wider audience about the outcomes of the skills assessment. Influencing migration policy is higher on the agenda for employers than for unions.

Figure 18 **Use of skills needs information – employer association and trade unions**
(% of national stakeholders reporting use, aggregated by type of organization)



No information for Albania, Benin, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Malta, Montenegro, Serbia, Turkey
Source: Employers' association and trade union questionnaire

Trade unions tend to emphasize the impact on their constituents more often: training individuals is high on the agenda, both in developing or upskilling and retraining programmes and in advising workers on skills development where they work. It is also important for them to develop their own strategic position in the many aspects of their work.

BOX 7:
Steering education and training in Finland with LMI

Finland has a long tradition of consensual policymaking and high usage of collective agreement and acceptance of forecasts results. This ensures that skills forecasts are widely used and valued.

As part of the National Education Development Plan, the two key forecast tools VATTAGE (steered by the consortium of key ministries) and MITENNA (the Ministry of Education and Culture) steer education in accordance with sectoral developments and vocational education needs for young people. Sector-specific long-term forecasts from VATTAGE are the basis for education design. The MITENNA system translates the results of VATTAGE scenarios (sector-specific labour needs) into education provisions. These are discussed by councils at different levels (national, sub-national and local) to make adjustments to provisions according to stakeholder views (for example, the 26 national and sector-specific education and training committees, tripartite bodies in each occupational field, supporting the design and content of upper secondary vocational and higher education). The outcomes are then turned into proposals for future occupations.

A dialogue process is used to develop proposals for future education targets. The working group consists of representatives of the Ministry of Education and Culture, the National Board of Education, education research, provincial government, regional councils, the Finnish Association of Local Government and the Ministry of Employment and Economy. The main trade unions also contribute to the process while the different regions are obliged to take into account national and regional forecasts in planning their future strategies and activities. The whole process uses and comments on the long-term qualitative information of VATTAGE and other sources, both qualitative and quantitative. An advantage of using VATTAGE data is setting a common framework for stakeholder cooperation and a sustainable anticipation procedure, improving its reliability and accountability.

Source: European Commission (2015)

Figure 19 provides an overview of the importance of the various uses of skill needs information across the country groups (by income level). In high income countries the information plays a smaller role in the development or funding of up- or reskilling programmes or in apprenticeship and work-experience programmes, it is more important in middle and lower income countries. This suggests that assessments in lower and middle income countries may be more commonly linked to the delivery of specific programmes rather than as part of a comprehensive national exercise. The use of the assessments to influence the work of ministries is comparable across country groups, with

BOX 8:
Examples of stakeholder involvement in skills assessments in Africa

In Malawi, Sector Advisory Councils (SACs) have been very important in curriculum development; at national level these bodies are also involved in elaborating local policy response through the decentralization programme with the Ministry of Local Government and Rural Development. According to the employer organization representative, output from skills assessments are also used as a base for decisions on temporary employment permits. Trade unions use the output to inform self-employed workers in the informal sector.

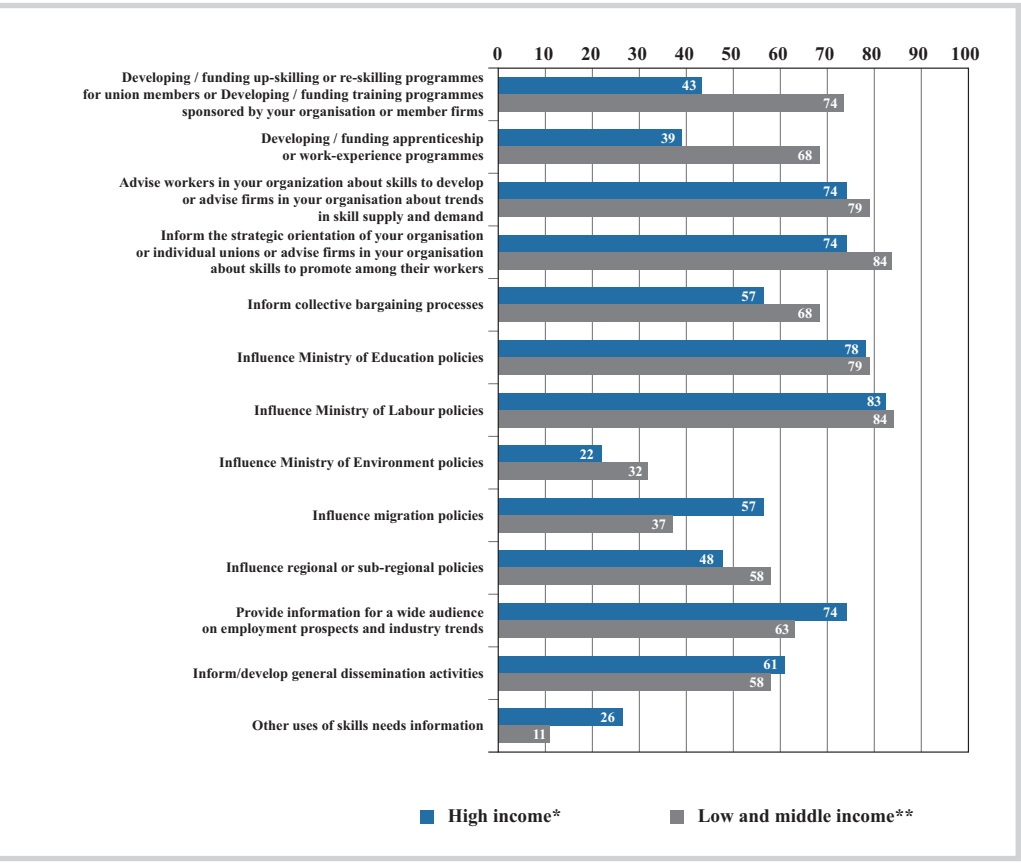
In Tanzania, assessments are based on individual institution needs and are not exhaustive and systematic; they reflect ad hoc and piecemeal engagement by special partners. The country has not yet implemented ISCED and the descriptors for education and training programmes are not easily aligned with industry and occupational groups.

In Uganda, international development agencies such as the International Organization for Migration and multinational corporations such as Tullow Oil, CNOOC and Total are involved in skills exercises but there is no regular assessment led by government. An employer organization stated that it would use the output of skills assessments for many purposes if the information existed.

In Zambia, the Ministry of Labour is leading skills forecast and skills assessment. According to the Ministry of Education, skills intelligence is used to establish new skills training centres, to promote certain sectors to build a demand for skills (such as construction and tourism), and to assess which skills are demanded and trained by companies. According to the Ministry of Labour, findings are shared with both training and industry institutions and also with students so that they make informed career choices. The labour market information steering committee, established in 2008, advises the Ministry of Labour which supplies the committee with skills information to inform their decision making. In discussing alternative policy measures, findings are shared with the African Development Bank, the ILO, and relevant government ministries. The employer organization would like to take a greater part as it was only involved in the validation process in the past. According to the organization, training institutions do not train adequately to meet labour demand, which reflects the fact that industry and training institutions do not talk to each other. According to the trade unions' representative, the Zambian labour market is under-researched and few institutions have undertaken exercises related to skills information.

Source: Analysis of qualitative answers to ILO questionnaires

Figure 19 Trade union and employer organization use of skills needs information, by income groups
(% of national stakeholders reporting use, aggregated by income groups)



*/** No information for Albania, Benin, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Malta, Montenegro, Serbia, Turkey
Source: Employers' association and trade union questionnaire

the exception of lower income countries where its importance seems to be lower. Informing the strategic orientation of the stakeholder organization is strong in all country groups. Advising workers on skills to develop also seems comparable across groups.

The need to provide different information to different groups seems to vary according to income level. The higher a country's income level, the more likely it is that stakeholders see this as a central outcome and role for them in any skill needs assessment.

BOX 9:
Examples of good practices linking LMI with career guidance

The use of multiple communication channels is necessary to guarantee access to quality services by a diversity of users. Particularly important are combinations of technology-based services integrated with personalized professional career services. The Danish eGuidance service offers to both the young and adults, via its Education Guide web-portal, a wealth of information on education and training opportunities, jobs and professions, labour market conditions and statistics and study programmes taught in English. The same service provides a variety of guidance materials and activities via a combination of channels, including online chat, telephone, webinars, email services and social media interaction. Each service is used according to the profile and needs of clients, supported by professional counsellors with targeted ICT training.

A distinctive characteristic of quality skills intelligence provision in guidance services is use of tools to reduce dispersion of sources and provide intelligence that can be easily integrated into a careers information service. An example is the British online data portal LMI for All, which connects and standardizes existing sources of high quality, reliable LMI with the aim of informing careers decisions. The data are freely available through a single access point or via an application programming interface (API) for use in websites and applications. It is owned by the UK Commission for Employment and Skills (UKCES) which empowers a non-expert audience (in LMI) to set up guidance services with reliable career information.

Source: Cedefop (2016), Labour market information and guidance

5.3. Key obstacles in skills assessments

Developing skills assessments, agreeing on results and developing policy responses is not a simple task. Assessment and policy responses often touch on policy areas covered by several ministries, predominantly ministries of labour and education but sometimes also ministries in charge of migration and social welfare. Responses have to be coordinated not only between ministries but also beyond, with key stakeholders like employer associations and trade unions. These interactions are often prone to conflict and generate different insights into the causes and consequences of skills mismatch. In addition, all these organizations face their own, internal constraints in dealing with skills assessment and in formulating policy responses.

In the following section we discuss the key obstacles facing ministries and stakeholders. Differences of opinion and conflict can occur over inputs,

methodology, and analysis, and in cooperation between ministries and across a wider group of stakeholders required to undertake the assessment.

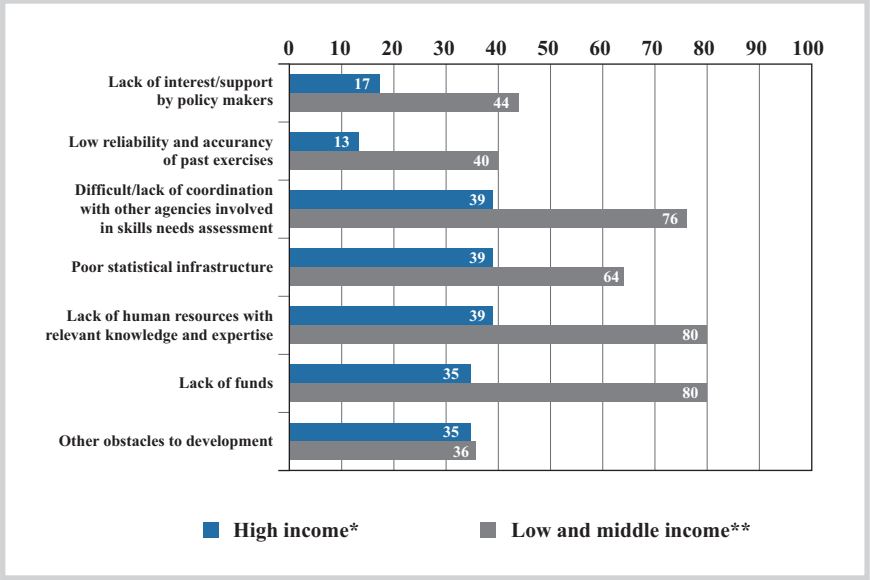
The context - comparing survey results from countries with very different institutional settings for skills assessment and anticipation – is important. Many countries have well-developed systems of assessment and anticipation but obstacles can still occur in these cases. These obstacles are less likely to affect core development and discussion of the results but may affect the details of further methodological or data development, problems of coordination and interaction across ministries and between ministries and stakeholders. Countries that are currently in the process of developing a (coordinated) approach to skills assessment and anticipation are also more likely to encounter problems of common data standards and methodological development, in setting up structures to analyse and coordinate feedback on the results, and in securing the sustainable and continued support necessary to develop and sustain the necessary knowledge and human resources in the various ministries, organizations and stakeholders involved.

Figures 20 and 21 present the reported problems of ministries and other stakeholders when using the skills assessment further within their organizations. The biggest problem seems to be the lack of human resources; across all countries about 55% of ministries note this as their main barrier to further development, whereas the social partners, on average, mention the same barrier in 74% of cases. For the ministries, lack of funds (51%) and difficulty coordinating with other organizations involved (49%) are two frequently mentioned problems. Social partners are more often hindered by lack of funds (88%), and of proper coordination (65%).

The group of lower and middle income countries experienced greater difficulties. Lack of human resources and of funds are barriers in 80% of low and middle income countries. In addition, coordination problems, and the lack of adequate statistical data and methodological rigour leads to weak results and a barrier to further use. The survey results suggest that this is more of an issue here than is the case in high income countries where problems relate more to developing advanced methodologies and convincing interested parties from ministries and external stakeholders to continue their support.

Improved coordination and overcoming barriers among internal stakeholders is often done by linking skills assessments to national development strategies (as in Bangladesh and Tanzania), developing cross-ministerial collaboration mechanisms or committees (Egypt, Colombia), or through specific education plans or policies (El Salvador TVET law; Jamaica National Strategic Plan for Education). This establishes initial collaboration, though several countries re-

Figure 20 **Obstacles in (further) developing activities - ministries**
(% of national ministries reporting occurrence of the obstacle, aggregated by income groups)



* No information for Australia, Denmark, Japan, the Netherlands, Poland, Sweden, USA
Source: Ministries of Labour, Ministries of Education questionnaire

port that keeping the process alive over longer periods seems to be challenging. Questions of responsibility and funding can also result in obstacles to collaborative governance of skills anticipation systems.

Figure 21 shows external stakeholder views of obstacles. In many countries skills assessments are one of the policy activities that employer associations and unions participate in, but as part of the wider engagement of general economic affairs and HRM development for their constituents that places the topic more towards the periphery of their activities. Only when the skills assessment gains prominence, either because of its successes or the urgency of the results, does a trade union or employer association consider it to be of high importance. The lack of perceived usefulness and of useful outputs in the past reinforces this view, as skills assessments first have to prove their value before more commitment is usually given. This is by no means specific to these stakeholders but also common in ministries that are only partially involved. In most countries employer associations see the topic more as a part of their core work area than do trade unions; this is partly reflected in the higher obstacles that trade unions need to overcome in all categories.

BOX 10:
Collaboration in Tanzania and Madagascar

With the Big Result Now programme in 2013, the Tanzanian government implemented so-called 'Labs' in which key stakeholders work together to develop policy solutions. According to the Ministry of Labour and the Ministry of Education, this seems to work well. The employer association surveyed was also aware of this programme. Cross-ministerial coordination is enabled through the Education Sector Development Committee (ESDC) that meets at least twice a year. The main challenges to cross-ministerial collaboration are that there is no clear leadership role for one actor in the process nor clear funding arrangements.

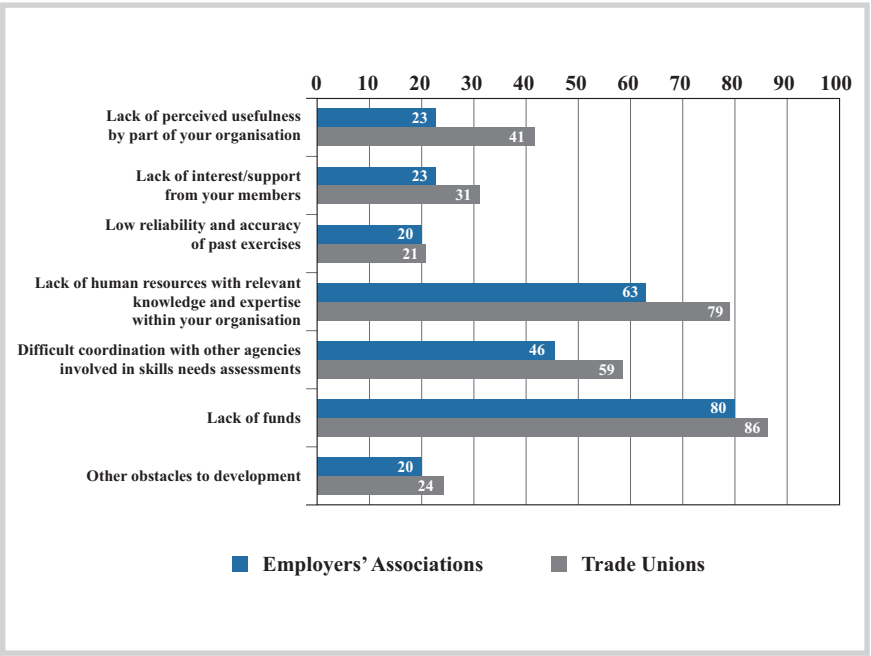
In Madagascar, the *Plan National de Développement* (PND) includes sectoral strategies for skills development. Stakeholder involvement is generally managed through consultations and bilateral exchanges. Ministry representatives meet in bodies such as the steering committee, where they have to overcome overlapping responsibilities, the lack of clear leadership, and administrative burdens.

Source: Analysis of qualitative answers to ILO questionnaires

Once there is sufficient understanding of the importance of this topic to stakeholders, the obstacles mentioned most (lack of funds and of human resources) can usually be overcome. The remaining barrier to proper coordination with other stakeholders and ministries still needs to be tackled and can influence funding and capacity issues.

Trade unions and employer organizations gave reasons why they do not regularly carry out their own skills assessments, forecasts and foresight exercises. In Brazil, according to the social partners, the limited tradition of setting up and using the results of these exercises and also the lack of integration of the results were mentioned. In Benin and Egypt, social partners feared that their own efforts may not be valued as there are also exercises led by policy makers. In Egypt, social partners also mentioned that policy makers are often not aware of the exercises that they conduct. A Colombian trade union mentioned that as material from union assessments is not used by companies, they were reluctant to carry out their own regular exercises. In Uganda, a major constraint according to social partners is finance. According to social partners in Zambia, the law allows only statistics produced by the Central Statistics Office to be used officially, while trade unions stated that there is a lack of capacity. In Jordan, trade unions stated that there are no plans for carrying out skills assessments due to lack of human and financial re-

Figure 21 Obstacles in (further) developing activities – trade union and employer organizations
(% of national stakeholders reporting occurrence of the obstacle, aggregated by type of organization)



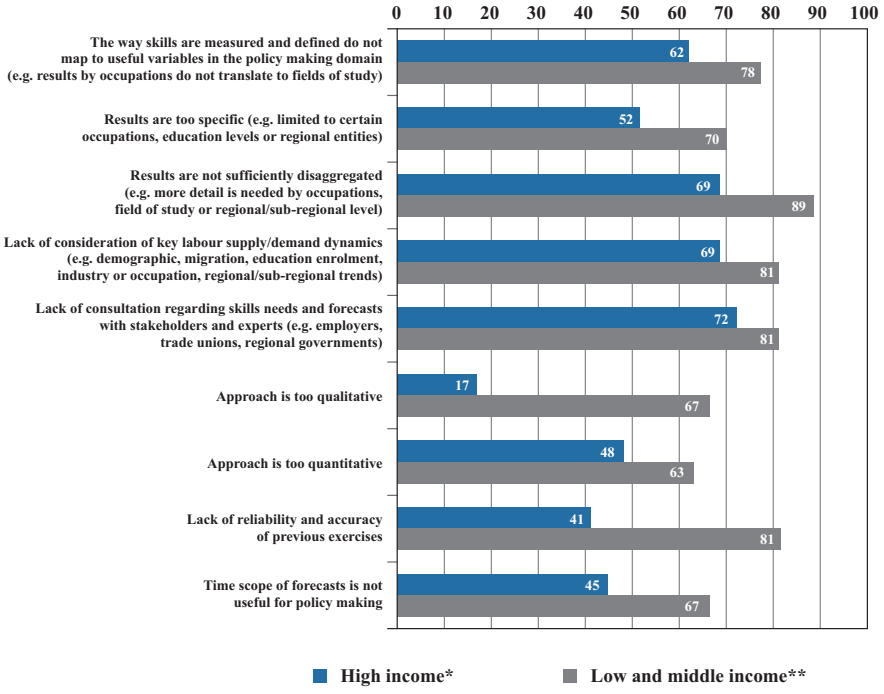
Other stakeholders (only in Bosnia and Herzegovina and Kosovo) are not representative and were excluded.
No information for Canada, Germany, Finland, India, Korea, Mozambique, Norway, Turkey
Source: Employers' association and trade union questionnaire

sources. Social partners in El Salvador say that they lack information on how to implement these exercises. These examples highlight the range of issues confronting social partners in their efforts to undertake and participate in skills assessments.

5.4. Barriers in policy formulation

The identified skills anticipation barriers are only one element preventing successful implementation of skills anticipation in skills development systems. A second barrier typically occurs in using results and their translation from LMI and intelligence into policy action, through the formulation of goals and targets with respective implementation.

Figure 22 Barriers in translating skills needs information into policy and practice by income group
(% of national constituents reporting occurrence of the barrier, aggregated by income groups)



* No information for Australia, Czech Republic, Italy, Malta ** No information for Benin
Source: Ministries of Labour, Ministry of Education, employers' association, trade union, and other stakeholders' questionnaire

Within OECD and EU countries the main barriers to moving from analysis to policy formulation are lack of consultation with stakeholders, and the fact that some approaches do not take account of specific issues in national contexts (such as labour supply and substitution effects). In addition, the level of analysis is often too aggregated and the measurement of skills too simplified for an easy translation into policy and programme actions. In some countries, usually with narrower and less established systems of skills anticipation, lack of reliability is also considered a problem.

Developing countries usually encounter all these barriers, but they are, typically, much more pronounced and often at a more fundamental level. This is especially so compared to high income countries that have working skills assessment and anticipation systems and well- developed technical capacity.

Figure 23 examines barriers in the communication of results to a wider audience. Lack of access to outcomes and results is the main point criticism. Without proper and widespread distribution in an understandable format, the results are likely to be largely ignored.

Another important aspect is that the results are often based on past data, which can lag by a significant amount of time. One or two years should be considered normal in terms of statistical data availability, but that is not always the case and further time is necessary for analysis.

BOX 11:
Effective transmission of LMI

The experience of Poland

The main tool for forecasting in Poland, the Study of Human Capital (BKL), includes a clear dissemination strategy, with structured steps and mechanisms along with a specific budget line. Dissemination initiatives include annual reports on the BKL website, cycles of national conferences, and regional seminars targeting multiple stakeholders. BKL experts participate in an advisory role in employment committees while PES officials are actively involved as stakeholders in the BKL analysis.

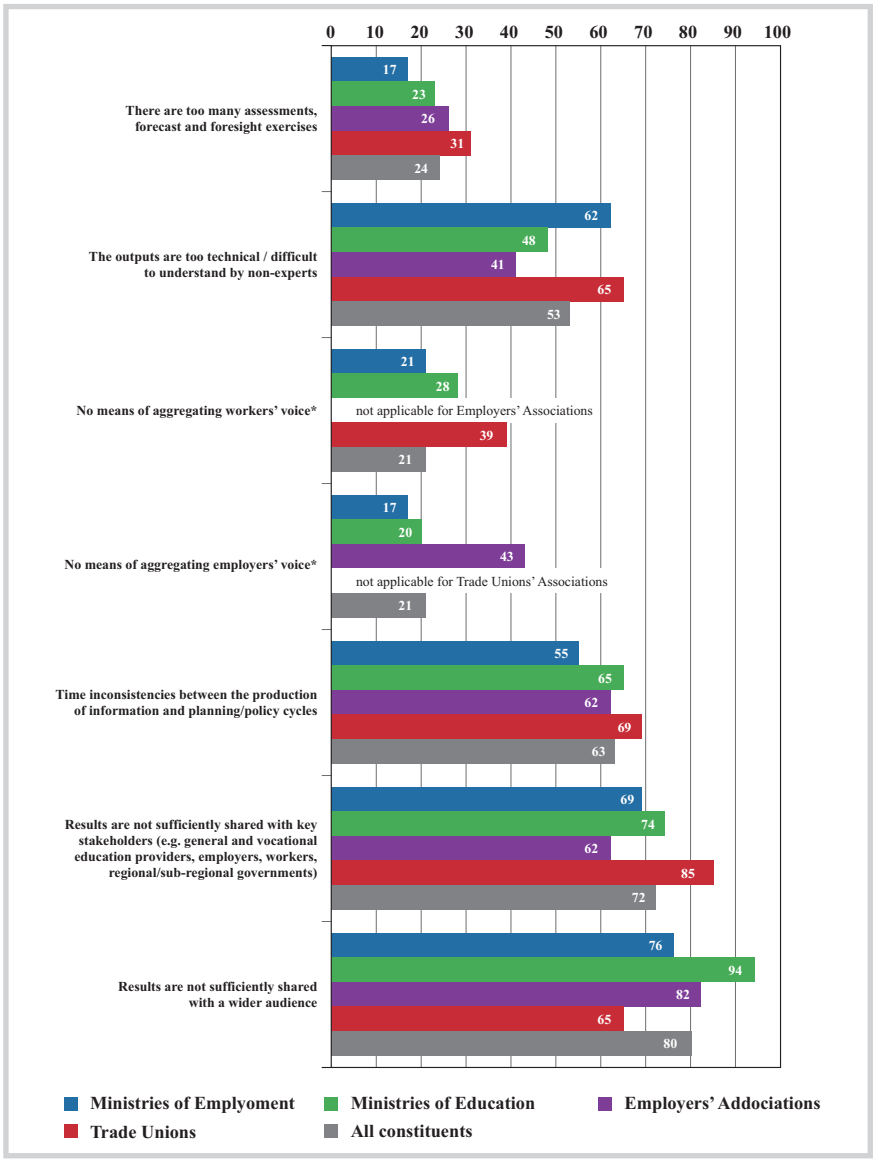
The experience of Bulgaria

As part of the new system for forecasting workforce demand, a formal 'Mechanism for including the results of forecasts in developing and implementing government policies' has been adopted. The mechanism outlines which competent institutions should use the results of the forecasts and how. It requires setting clear and transparent guidelines for information exchange and involving institutions. Institutions are encouraged to provide their feedback and recommendations for the further development and fine-tuning of the LMI instruments. To ensure effective use of information, competent institutions are required to submit annual reports on using the forecasting results in policy formulation and implementation; these are used by the Ministry of Labour as feedback for reviewing and improving forecasting methods.

Source: European Commission (2015)

Figure 23 Barriers in the communication of results to a wider audience by type of organization

(% of national constituents reporting occurrence of the barrier, aggregated by type of organization)



***** Answer was not applicable in the ETF questionnaire, therefore no information for Albania, Bosnia and Herzegovina, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Serbia (% relate to all countries with the exception of ETF-countries)

No information for Australia, Benin, Czech Republic, Egypt, Italy, Malta, Turkey, USA

Source: Ministries of Labour, Ministry of Education, employers' association, trade union, and other stakeholders' questionnaire

Understanding the results is also a key problem, especially when a more distant public needs to be informed. While the main outputs are quite technical and difficult to understand, along with all implications, a more accessible presentation of key outcomes could be considered, overcoming the third key obstacle. European countries seem to be better in making this 'translation' and developing different knowledge and information products targeting different users.

For developing nations this aspect, together with perceived time inconsistencies, limits the relevance of skills assessments. These countries often also suffer not only from slower availability of statistical data, but also from infrequent updates and reporting of skills assessments. The issue of timing is of crucial importance in these countries.

6. Analysis of choices – institutions, tools and governance

This final section covers general aspects of skills assessment and anticipation in the countries surveyed as part of this report. This differs from previous sections which concentrated on very specific aspects. We present further analysis using statistical methods to understand what drives the choice of a certain instrument, tool or governance style. The variables applied in this approach are background variables describing the countries by their economic circumstances (overall income level; unemployment rate) and political and/or geographic location.

6.1. Common patterns

The first set of analyses aims to explain what determines methodological choices in skills assessments. It distinguishes between skills assessments that are 'forward-looking' and those that are not, as well as investigating to what degree a country attempts to use complex skills anticipation systems. To simplify, we assume a binary distinction in which we classify a system to be forward-looking if either a quantitative skills forecasting model is used or a combination of two of the three alternative methods: employer surveys, graduate surveys, and sector studies. Analysis using simple linear regression models has limited explanatory power, explaining only about 13% of the variation. High income countries are more likely to use forward-looking skills anticipation approaches and also more likely to use complex methods. The per-capita income grouping suggests that the low-middle income group score generally lower on the use of forward-looking and complex methods, while high and middle income countries have higher scores.

A second element is the inclusion of a wider range of stakeholders in developing and implementing policies based on skills assessments.[7] This has been

[7] Another interesting analysis would have been to explain the external stakeholders' active role in developing tools, but there were insufficient observations for meaningful quantitative analysis of this aspect.

quantified by counting the number of different organizations that a ministry claims to include in the discussion of results and in policy implementation. Including a wider variety of stakeholder (types) increases the level of stakeholder involvement; the number of stakeholders involved, however, does not necessarily reflect higher quality stakeholder involvement but merely reflects the inclusiveness of the approach. The statistical analysis shows that there is not much difference between high and low income countries in level of stakeholder engagement after the assessment has been completed. Both have the tendency to include a wide range of stakeholders in the discussion and in developing policy responses. However, the statistical evidence from this analysis is rather weak.

Dissemination of results to a wider audience needs to be considered. Higher rates of dissemination can be found in countries with lower overall unemployment rates, even though we cannot test available data for any causal relationship. It is also more common in high income countries than in middle and lower income. While higher levels of dissemination is not related to the complexity of methods as defined above, a forward-looking approach to skills anticipation makes it more likely that the results are distributed more widely.

6.2. Feasible skills anticipation choices

There are only a few elements of skills assessment and anticipation that can be directly related to country types, as extracted from the responses to the survey. Given the set of 61 countries we should not overemphasize a statistical search for regularities; there will always be cases of relationships that are more statistical artefacts rather than stable relationships.

In this section we attempt to draw together lessons from the literature and the survey results to address the question of whether or not it is possible to recommend a particular approach to skills anticipation in any given country context. The aim of doing so is not to prescribe a perfect solution but to re-emphasize certain aspects of the institutional arrangements for skills assessments that have proven to be important elements of improved LMI systems.

Not all suggestions fully reflect responses from all countries, nor are they able to be statistically proven. Consequently, approaches to skills anticipation should take these recommendations as suggestions to be evaluated critically for each country context.

Feasible approaches to skills anticipation and matching for specific country groups are presented, considering the availability of inputs (data, expertise,

funding and institutional setting) and the extent to which key obstacles vary. This helps in defining feasible approaches and choices.

Which type of approach is feasible fundamentally depends on the circumstances and institutions within a country. None of the approaches are necessarily better or worse in all respects, nor is there an ideal combination of approaches or institutions. However, it seems from lessons learned in countries with long-standing skills anticipation systems that there needs to be a clear mandate and institutional ownership, along with consistent involvement of internal and external stakeholders. If these elements exist, users of the information can develop useful interpretations of the results to build into their decisions and translation into policy.

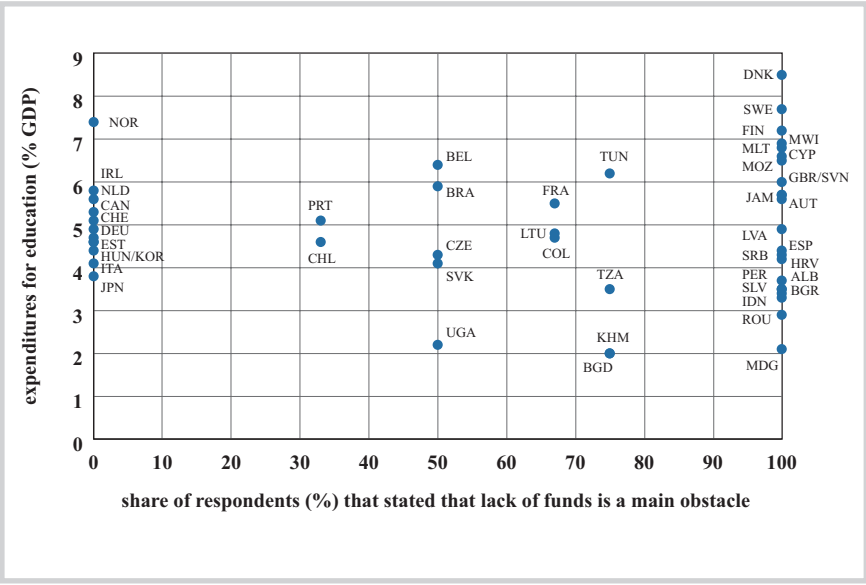
Extensive work on this in the European Union and among OECD countries has involved substantial discussions and exchanges between experts of the member States. Many activities in EU and OECD countries are reflected in this report.

While it might not be the goal of all countries to develop an advanced national system of skills anticipation, skills assessments require attention to be paid to institutional arrangements, data and methodological infrastructure, as well as to , cooperation across ministries and stakeholders.

Finally, skills anticipation and its analysis hinges on adequate funding being available. Figure 24 shows that the lack of funding is not only a problem in countries where expenditures for education are very low: the issue also exists in countries where these expenditures are high.

Figure 25 shows that some high income countries (including Austria, Denmark, Finland, United Kingdom) stating lack of funds as a major obstacle: higher values on the vertical line indicate that all – at 100% – respondents agree on this point, while 0% indicates that it is not mentioned). Countries where per capita income is much lower, including Benin, Estonia, Greece and Hungary, do not see this as a major problem. The point to be made here is that allocation of government funds is always a contested issue, influenced by political cycles and competing priorities. The trade-offs are numerous. The analysis also suggests that sufficiently funded programmes exist in lower income countries, while richer countries do not seem to have funds available for this endeavour. This may reflect other times in which funding has been more readily available than is currently the case, or the fact that the scope and effectiveness of existing systems is limited. Regardless, funding is an issue to be carefully considered.

Figure 24 Lack of funds and GDP allocated to education
(% of national constituents reporting occurrence of the barrier, aggregated by type of organization)

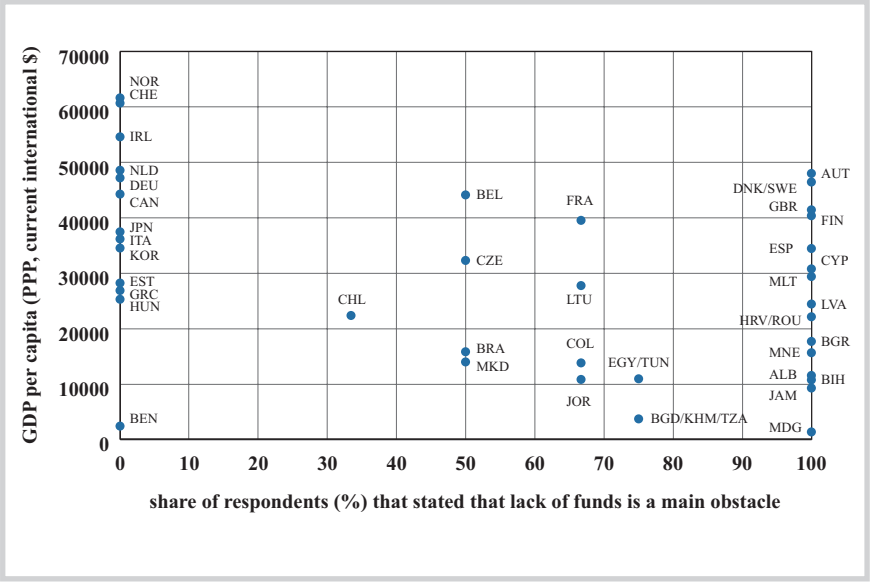


* No information for Bosnia and Herzegovina, Egypt, Greece, Jordan, Kosovo, Former Yugoslav Republic of Macedonia, Montenegro, Turkey, Zambia. Data on GDP expenditures refer to 2011 (CAN, CYP, DNK, HRV, HUN, ITA, PRT, SLV), 2012 (BGR, BRA, CHE, CZE, DEU, EST, FRA, IRL, KOR, LTU, MLT, NOR, ROU, SRB, SVN, TUN), 2013 (ALB, AUT, BGD, CHL, ESP, FIN, GBR, KHM, LVA, MDG, MOZ, NLD, SVK, SWE, UGA), 2014 (BEN, COL, IDN, JAM, JPN, MWI, PER, TZA). Source: UNESCO Institute for Statistics ** No information for Australia, Indonesia, Poland, USA. Source: Ministries of Labour, Ministry of Education, employers' association, trade union, and other stakeholders' questionnaire

Five points can be considered as key elements in the continued development of a skills anticipation and assessment system in any country:

(1) Ensuring a sufficient statistical base: one of the key elements of any skills assessment is reliable and consistent data series, with sufficient depth of key education and labour market variables to make meaningful analysis possible. While much work has been done to ensure good labour market data is available in many countries, some improvements in the classification, the level of detail or the sampling would provide a more consistent and stable data source that can be used as a basis against which additional data collections (such as employer surveys, tracer studies) can be analysed. Classifications across the various data-sources should be standardized or allow for standardization, while collection frequency should be sufficient that the statistics derived show a fair representation of the current situation.

Figure 25 **Lack of funds and GDP per capita (PPP, current international $)**
(% of national constituents reporting occurrence of the barrier, aggregated by type of organization)



* No information for Kosovo. Data on GDP per capita refer to 2015 except for Malta (2013). Source: UNESCO Institute for Statistics ** No information for Australia, Indonesia, Poland, USA. Source: Ministries of Labour, Ministry of Education, employers' association, trade union, and other stakeholders' questionnaire

Without this proper basis, skills assessment remains discussion, generating (perhaps inaccurate) claims of what is really going on in a country and failing to support evidence-based policy in the absence of essential details.

(2) Building technical capacity – and keeping it alive: after establishing a good foundation of statistical and qualitative data, it is also necessary to have the technical capacity to understand and work with it. If this technical capacity does not exist, it will not be possible to analyse statistical and other data types in terms of skills, to identify potential current and future issues, and to interpret the approaches that are used. Almost all approaches to skills anticipation demand experience that allows analysts to interpret changes over time and suggest how the labour market would possibly react to policy responses.

Each individual instrument or approach used in an assessment also benefits greatly from improved experience within the team that is developing and conducting that part of the skills assessment. Agencies, ministries and

stakeholders can reap the full benefits of these assessments when they have direct experience in interpreting the results related to their specific policy fields. However, the worst that can happen to a set of skills assessment tools is continuous change in methods, teams and persons involved. This frustrates continuity in methodological development, leads to results not being meaningfully compared over time, and increases the likelihood of ad hoc policy recommendations.

(3) **Building a coordinated network of agencies and stakeholders:** related to the previous point is a strong recommendation to invest a large share of the effort in developing a network of relevant agencies, ministries, specialists and external stakeholders to participate in regular meetings or specialized working groups. If the size of a relevant stakeholder group is large, different elements can be broken up into specific working groups, with the potential need for cross-fertilization and discussion of outcomes across the groups. The positive involvement of the full range of stakeholders is the only way to ensure that all groups start to understand the benefits of skills assessments, that they experience the difficulties of interpreting and translating the results into policy actions, and develop an understanding of what can be achieved in the future, including which elements will benefit from alternative approaches. While the network is likely to evolve over time, it is important to ensure coordination by assigning responsibility for coordination to one of the organizations involved.

(4) **Starting small, growing gradually:** all organizations involved in the set-up or further development of a skills assessment system should understand the importance of establishing and developing a system gradually. They should learn and understand its methodological approach and how to interpret the results, ideally in collaboration with ministries and stakeholders but without direct pressure to formulate immediate policy actions from the first round(s) of a new instrument. Deriving and interpreting results and developing policy actions from skills assessments is also a learning process. The first round should be used to identify potential issues, as a deeper understanding of the dynamics can only be derived after several rounds.

In countries or regions that decide to do a proper skills assessment, impatience may be observed if government looks for a blueprint for the best or most cost-efficient skills assessment that can be quickly implemented. This is unrealistic. The goal should be to develop existing approaches into a more mature state, while considering expanding the project to incorporate other methods and stakeholders. This step-by-step approach, building on existing strengths in a country, will help slowly to expand the skills assessment towards becoming a more complete set of tools and institutional

arrangements, with existing networks used to build working groups for the various approaches and policy fields.

(5) **Efficient support by donor lead projects:** as many countries do not have adequate budgets they often rely on donor projects to develop skills assessment and anticipation systems. This presents a problem, as the projects are necessarily limited towards a specific timeframe and outcome. They are likely to finance first development of an instrument, as in a sector study, which can be useful in initiating structures and mechanisms that allow for exchanges and build up local expertise. However, there can be a danger of overly relying on external expertise without transferring some of the knowledge to specialists in the country. In addition, continuity is often unclear. In the worst case, different approaches and projects are initiated and finished without building upon them and combining the expertise across ministries, stakeholders and national experts supporting the work. Projects should generate synergy among various efforts, as with complementary project outputs. They should contribute to building a system in over the longer term, linking priorities to broader policy frameworks such as national employment policy or skills development/TVET. Otherwise there may be lack of commitment among organizations and individuals involved beyond any project phase. In an ideal world, projects could be used to build local expertise and approaches, gradually establishing a sustainable base. After some time, the ministries, stakeholders and experts involved will be able to contribute to policy making progress irrespective of donor funding.

7. Conclusions and recommendations

Combined information from the questionnaires distributed by OECD, Cedefop, ETF and ILO has permitted analysis of the use and implementation of skills assessments in 61 countries. This report considers the approaches and methodologies used, the actors involved, the modes of collaboration and coordination, the use of the outcomes in the policy process, and the challenges of implementation.

Existing institutional frameworks, along with the national culture of collaboration and trust, have a large influence on any skills assessment. They can determine whether it achieves its goal of informing evidence-based policies to improve the working of the education and training system for better labour market outcomes.

The use of different methods of skills anticipation is widespread. Countries that have very evolved systems often report using a similar set of activities to those that are starting out. Differences between countries with established systems and those at the beginning of developing them are hard to find within the quantitative answers. Many responses relate to a country's broader development. While more elaborate approaches or combinations of approaches tend to be used in higher income countries, a wide variety of methods are still used within low and middle income countries.

The frequency of skills assessments ranges from multiple times a year, for analysis of existing statistics, to once every five years for approaches repeated in a consistent way. However, many countries also report that all or most of the approaches are only revised or updated infrequently.

Many countries use forward-looking skills anticipation approaches to assist them in formulating policy responses that overcome skills mismatch. In looking to the future, however, approaches are usually grounded in an assessment of the current situation. Several countries, especially but not exclusively lower income, highlight the problem of insufficient data for the purpose of forward-looking exercises.

Obstacles and deficiencies were identified in all countries surveyed. This serves as a reminder that skills assessment and anticipation is a continuous process in which gradual improvement is needed. This improvement should not only be in the underlying data or the methodology to provide evidence, but should also include collaboration in analysing and discussing the results, as well as in policy formulation and implementation based on the evidence. Technical expertise has to be built up both in the organization providing the skills assessment and among stakeholders, agencies and ministries that are mainly involved in the discussion on policy formulation and implementation.

The main obstacles cited relate to the lack of funds and required technical expertise, as well as coordination between the various organizations involved. Lack of reliable data sources also remains a problem, either because of fundamental problems in the data itself – particularly in lower income countries – or because the data are not sufficiently refined in variables or disaggregated to a local level to allow for more targeted policy responses.

Within OECD and EU countries, the main barriers to moving from analysis to policy formulation arise from the lack of consultation with stakeholders. Another problem lies in embedding the results and analysis in the overall labour market context. The first problem can be solved by strengthening the process by including stakeholders more formally in the institutional arrangements of the system. The second element requires development of adequate expertise to include and interpret the findings correctly. In some countries, usually those with less established systems of skills anticipation, lack of reliability of results is also considered a problem.

Skills assessments are fundamentally concerned with moving towards providing more factual underpinning for labour market policies, particularly in skills development. They allows for evidence-based policy involving a broad coalition of stakeholders in the process. However, in many countries there are barriers and obstacles to this ideal, in particular weak inter-ministerial dialogue, unclear mandates and lack of related legal provisions. These contribute to lack of capacity to understand the results produced. Wider and targeted outreach, using information processed and adapted for the needs of specific beneficiaries and a broad public in a consistent way, is rare.

Four key points from the analysis of the survey can help to develop skills anticipation and assessment:

– to ensure a sufficient statistical base, as all skills assessment, current or forward-looking requires reliable and regular data updates.

– to build up and sustain technical capacity by allowing a set of organizations to generate and update regular skills assessments and forecasts for a country. In this way technical expertise can be built up, methodologies can be developed, and analysis can be based on past experience.

– to build and further develop a well-coordinated and capacitated network of ministries and other stakeholders, with clear and legally stipulated mandates in launching skills anticipation and assessments activities, reviewing the results and assisting in the process of translating analysis into policy and practice.

– it is also important to extend and expand the approaches within the skills assessment and anticipation gradually and consistently. Too often new approaches are added without allowing adequate time to learn and use existing ones. Proper analysis requires specific experience within a country with a given set of approaches.

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Annex I - Glossary

Anticipation	Denotes various qualitative and quantitative methods aimed at identifying future skill needs.
Forecasting	Quantitative forecasts produce information on quantitative aspects of future labour markets through statistical projections, econometric models or similar methods.
Job	A set of tasks and duties performed, or meant to be performed, by one person, including for an employer or in self-employment (ILO, 2012b).
Labour market information (LMI)	Any information concerning the size and composition of the labour market or any part of the labour market, the way it or any part of it functions, its problems, the opportunities which may be available to it, and the employment-related intentions or aspirations of those who are part of it
Labour market information system (LMIS)	A labour market information system consists of a set of institutional arrangements, procedures and mechanisms designed to produce labour market information.
Matching	Matching denotes approaches and actions that aim to increase the employability of the workforce and reduce skills shortages, including filling jobs with qualified job seekers.
Mismatch	An encompassing term referring to different types of skill gaps and imbalances such as over-education, under-education, over-qualification, under-qualification, over-skilling, skills shortages and surpluses, and skills obsolescence. Skills mismatch can be both qualitative and quantitative, referring both to situations where a person does not meet the job requirements and where there is a shortage or surplus of persons with a specific skill. Skills mismatch can be identified at individual, employer, sector or economy level. (Andersen et al., 2010)
Occupation	An occupation is defined as a set of jobs whose main tasks and duties are characterized by a high degree of similarity. A person may be associated with an occupation through the main job currently held, a second job or a job previously held (ILO, 2012).

Qualification	A formal expression of the vocational or professional abilities of a worker which is recognized at international, national or sectoral levels. An official record (certificate, diploma) of achievement which recognizes successful completion of education or training, or satisfactory performance in a test or examination.
Skill	A term often used with very different meanings. In this guide, skill is understood as having the ability to carry out mental or manual activity, acquired through learning and practice, where skill is an overarching term which includes knowledge, competency and experience as well as the ability to apply these in order to complete tasks and solve work-related problems.
Skill shortage	Used in this guide as a quantitative term to describe a situation in which certain skills are in short supply, for example where the number of job seekers with certain skills is insufficient to fill all available job vacancies.
Skill gap	Used as a qualitative term to describe a situation in which the level of skills of the employee or a group of employees is lower than that required to perform the job adequately, or the type of skill does not match the job requirements (Cedefop, 2010).

Source: *ETF/Cedefop/ILO (2016a/b/c)*

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