Measuring Skills and Policies to develop them

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Outline of the presentation

- Motivation
  - Why skills? Which?
  - Knowledge gaps – The World Bank's focus

- The StEP Skills Measurement Study
  - The household and employer surveys
    - Design, Skills Measures and other data
    - Applications
- The SABER Workforce Development Tool
  - Policy areas benchmarked
  - Applications

What does it take to be a "well-educated" person in the 21st Century?

➢ Mounting evidence in OECD countries that both cognitive (e.g, literacy, numeracy) and non-cognitive (socio-emotional/ "soft") skills are key determinants of productivity, socioeconomic success and well-being

- Cognitive and non-cognitive skills improve employment and earnings, and reduce social problems (e.g, delinquency, substance abuse, teen pregnancy, obesity)

- Skills beget skills: Cognitive and non-cognitive skills predict access to tertiary education; participation in work training

➢ Both are *malleable* through life-cycle investments (maternal health, ECD, education, training) and incentives for OJT
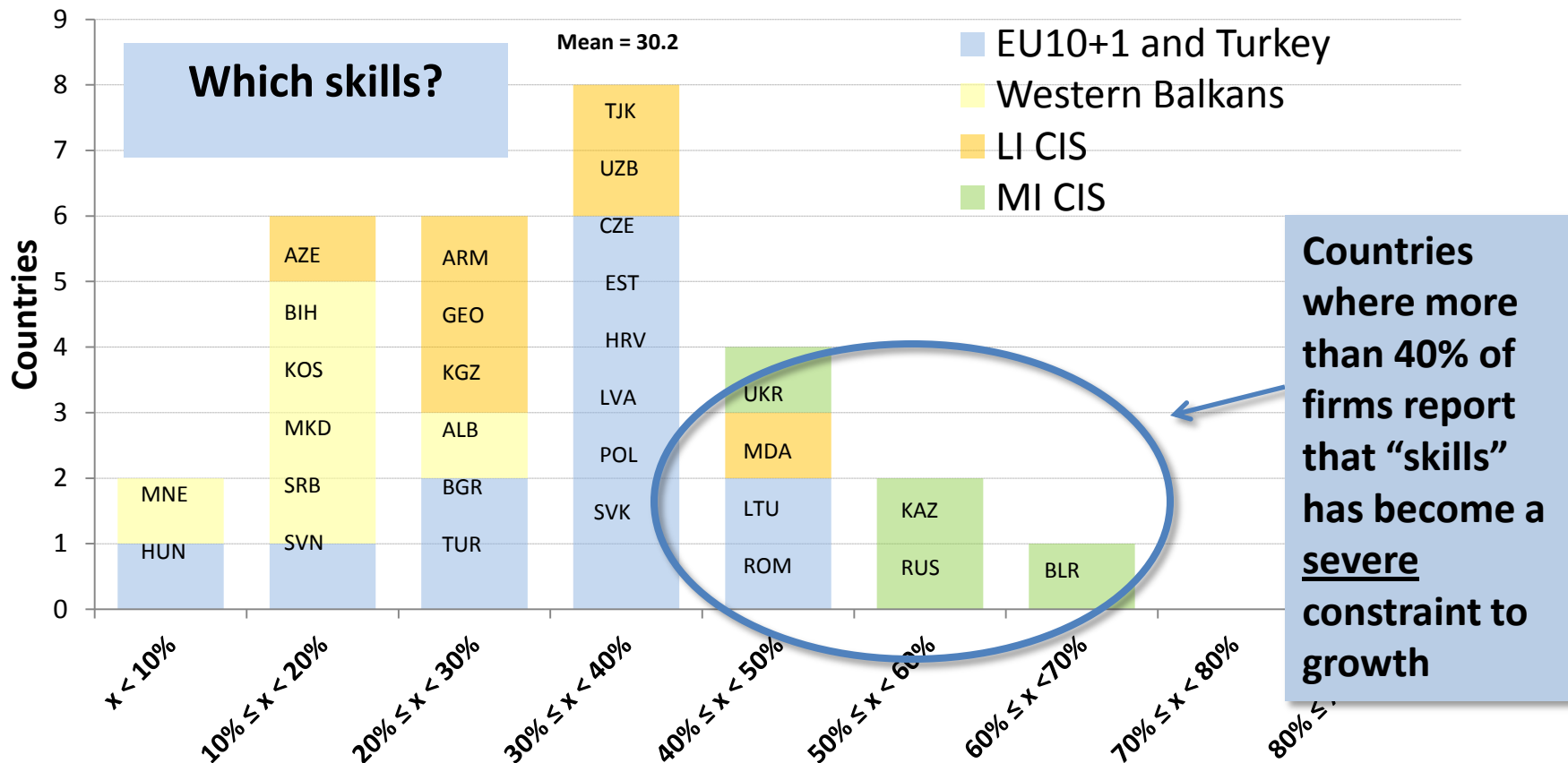
Houston we have a problem!: Many firms across the globe report skills are a major constraint

% of Firms Identifying Labor Skill Level as a Major Constraint
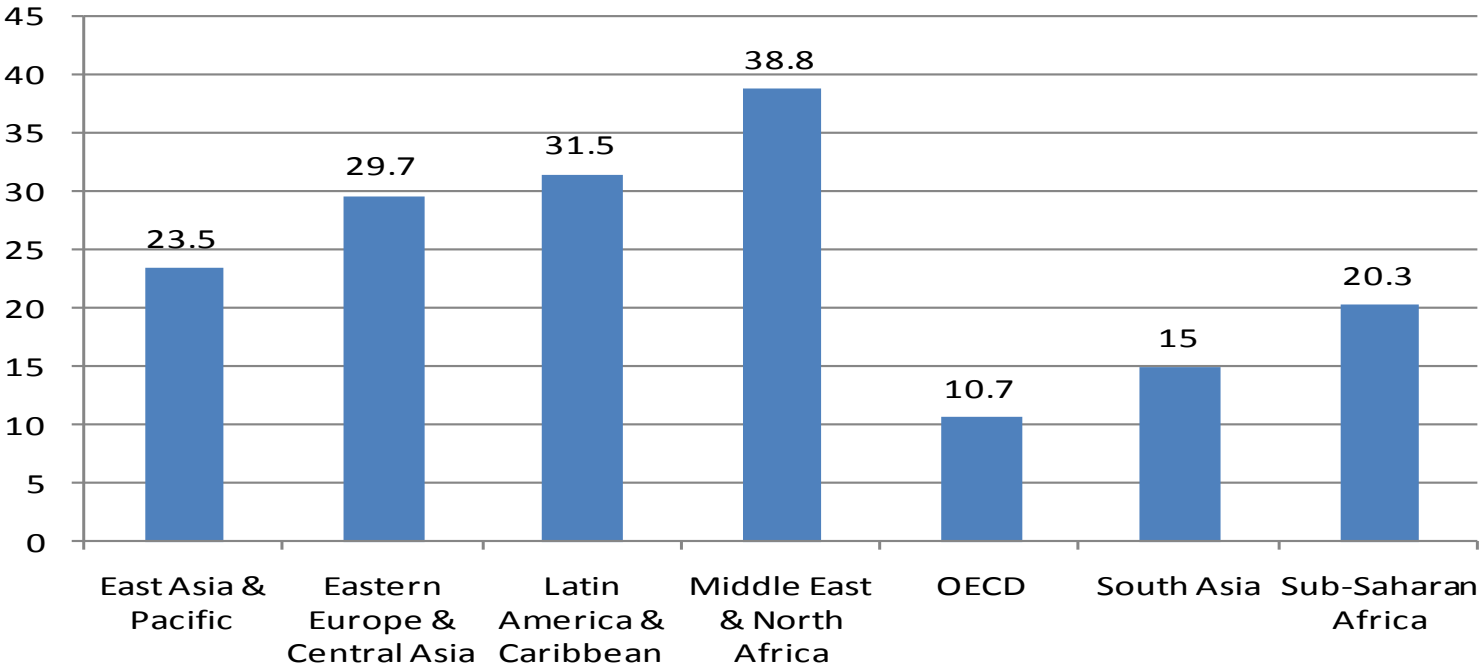
Source: www.enterprisesurveys.org, Sep 2010

In most of the ECA region the supply of skills hasn't kept up with changes in the demand

Workers' skills had become 2nd most important constraint on firm expansion by 2008. (percent of firms considering factor a 'major' or 'very severe' constraint)

Source: Turmoil at Twenty, World Bank, 2009

5

Many Eastern Europe students lack basic cognitive skills; We know little about other skills and the working-age pop

% of 15 year olds which are functionally illiterate

What about Soft skills? Technical skills?

Skills of adult population? Skills of tertiary graduates?
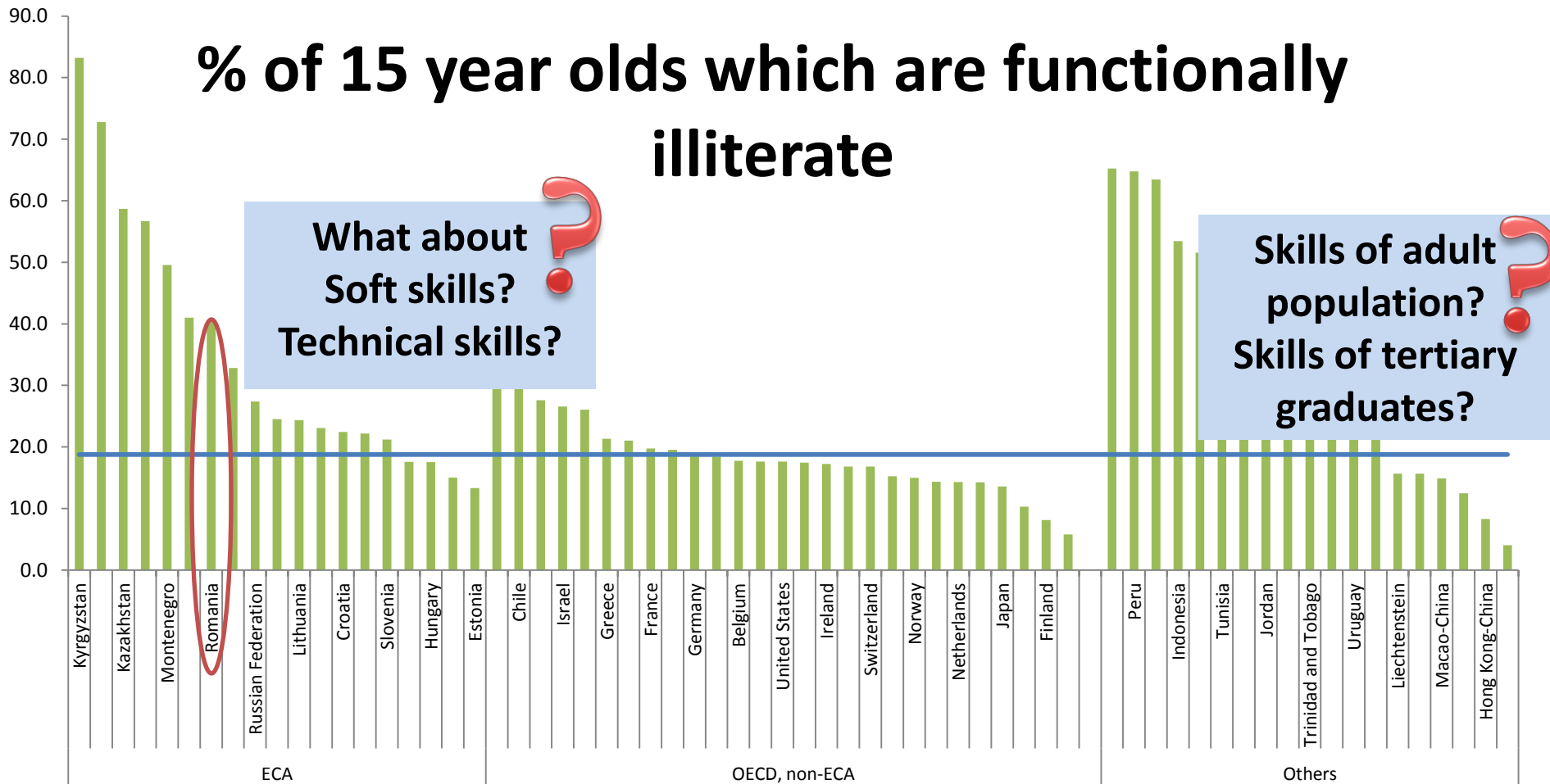
Source: OECD PISA 2009 (% students scoring "below level 2" on reading test)

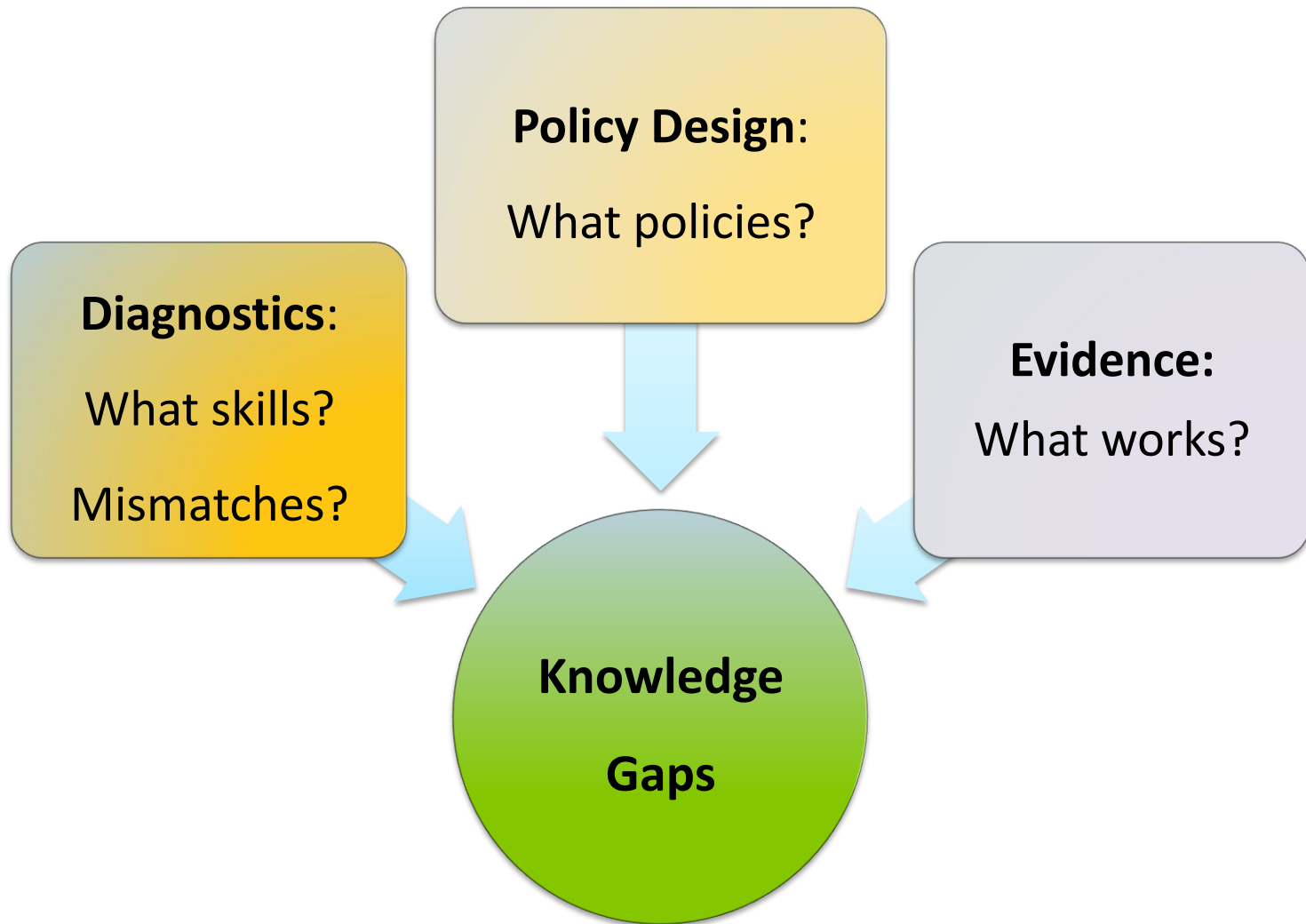# Three Broad Types of Knowledge Gaps to address skills mismatches

Focus of World Bank's work: How can the performance of the skills development system be improved?

More focus on skills, not just diplomas

Refocusing what we see: System performance (right skills developed)

Understanding what we don't see:

Policies

Institutions

Values

Focus of System Assessment and Benchmarking for Education Results **(SABER)**

Helping countries measure and analyze skills gaps, and benchmarking

- Unpacking skills – new STEP skills surveys:
  - To measure cognitive, technical and socio-emotional skills; links to socio-economic success and well-being
  - Building capacity to use tests to assess education and training systems and tracer studies to track graduates
- Benchmarking skills policies: SABER tools (www.worldbank.org/education/saber), and progress in skills formation (e.g, PISA, national tests)
- New expenditure tool to improve efficiency by linking expenditure to results

Measuring Skills: the STEP Study

STEP stands for *Skills toward Employment and Productivity*

A Holistic Conceptual Framework Linking
Skills to Productivity and Growth

Productivity
& growth

1 Getting infants off to the right start

2 Ensuring that all students learn

3 Building job-relevant skills

4 Encouraging entrepreneurship and innovation

5 Facilitating labor mobility and job matching
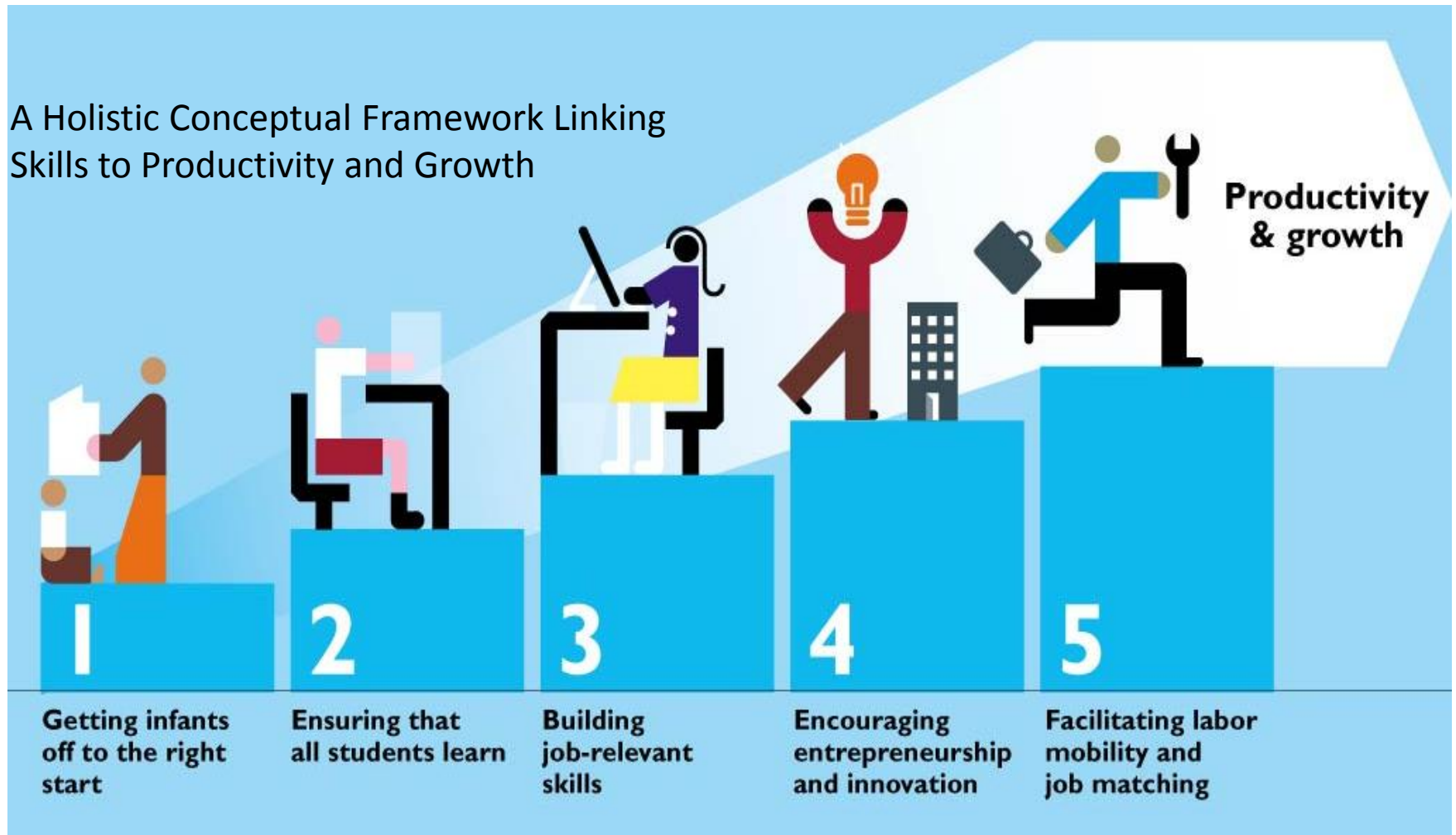
Worker's Skill Set Combination

Cognitive Skills **+** Non-cognitive Skills **+** Technical Skills **=** Skill Set

Cognitive

- Involving the use of logical, intuitive and creative thinking
- Raw problem solving ability vs. knowledge to solve problems
- Verbal ability, numeracy, problem solving, memory (working and long-term) and mental speed

Technical skills

- Involving manual dexterity and use of methods, materials, tools & instruments
- Developed through VET/university or acquired on the job
- Related to specific occupations/trades (e.g. engineer, economist, IT specialist, plumber)

Non-cognitive

- Soft skills, behavioral skills, life-skills, personality traits
- Openness to experience, conscientiousness, extraversion, agreeability, emotional stability
- Self-regulation, perseverance, decision making, self and interpersonal skills

What We Don't Know About Skills

❑ What is the skills profile of the labor force?

❑ What skills matter for employment and productivity?

❑ What is the nature and size of skills gaps (mismatches)?

New World Bank Initiative to address these Questions about Skills

STEPSK✶LLS

MEASUREMENT

THE WORLD BANK

The Niche for STEPs

- There are a few recent initiatives to address this gap

  - PIAAC (Programme for the International Assessment of Adult Competencies) by OECD
    - Computer-assisted administration
    - Designed for developed (OECD) countries

  - LAMP (Literacy Assessment and Monitoring Programme) by UNESCO-UIS
    - Designed for eligible developing countries
    - Paper administration
    - Limited background (employment) questionnaire

- Limited non-cognitive modules, no employer surveys to analyze skills mismatch

STEP Study | Objectives

❑ **Objective: internationally comparable data on skills of working-age**

   ❑ Harmonized survey instruments + standardized data collection protocols

   ❑ Support countries to analyze data related to skills mismatches

   ❑ Identify policy interventions to address skills-gaps and mismatches

The study involves two survey instruments

Survey of individuals	**Survey of employers**
Supply of skills	Demand for skills
• Sample size: 2,000-3,500	• Sample size: 300-500 enterprises
• Length: 120-150 minutes	• Length: 45-60 minutes
• Representative of urban areas	• Formal and informal sectors
• Population aged 15-64	• Geographic or economic sector based

HELP WANTED
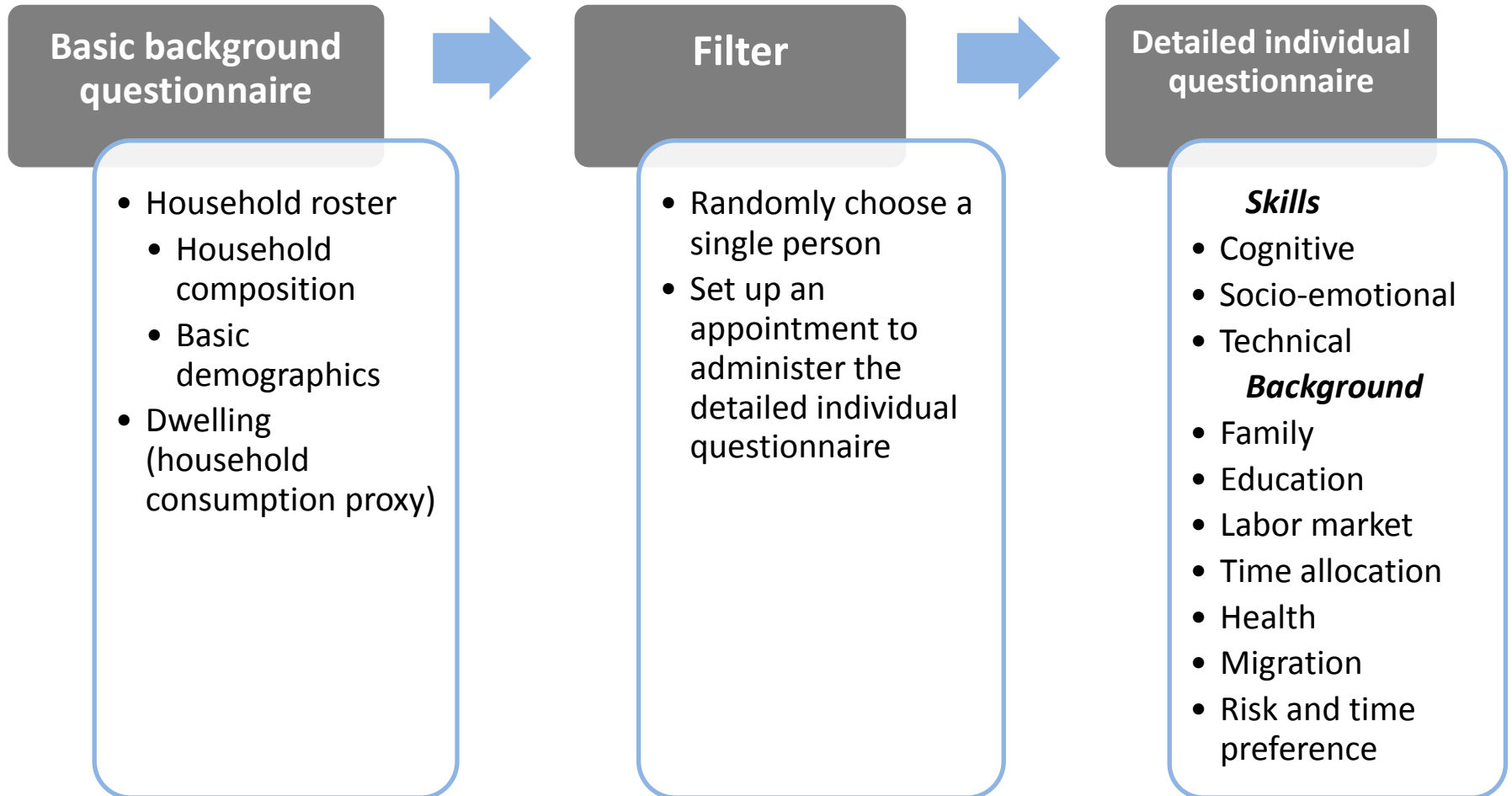
STEP Study | Research Questions

- ❑ What are the current levels and distribution of skills in the labor force?

- ❑ How do these skills affect labor market outcomes?

- ❑ What is the nature and size of mismatches between skills supply and demand?

- ❑ What is the relationship between generic skills and schooling attainment?

- ❑ What interventions can improve employability and productivity?

The StEP Household Survey
Survey flow

Basic background questionnaire

- Household roster
  - Household composition
  - Basic demographics
- Dwelling (household consumption proxy)

Filter

- Randomly choose a single person
- Set up an appointment to administer the detailed individual questionnaire

Detailed individual questionnaire

Skills
- Cognitive
- Socio-emotional
- Technical

Background
- Family
- Education
- Labor market
- Time allocation
- Health
- Migration
- Risk and time preference

Instrument for Survey of Individuals

Household
- Household Roster
- Dwelling characteristics

30 minutes

Individual Aged 15-64
- Cognitive Skills
  - Basic Test — All countries → 15 minutes
  - Extended Test — 5 countries → 50 minutes
- Technical Skills → 20-25 minutes
- Socio-emotional Skills → 30 minutes
- Background → 35-40 minutes

120 minutes (Basic test)

or

150 minutes (Extended test)
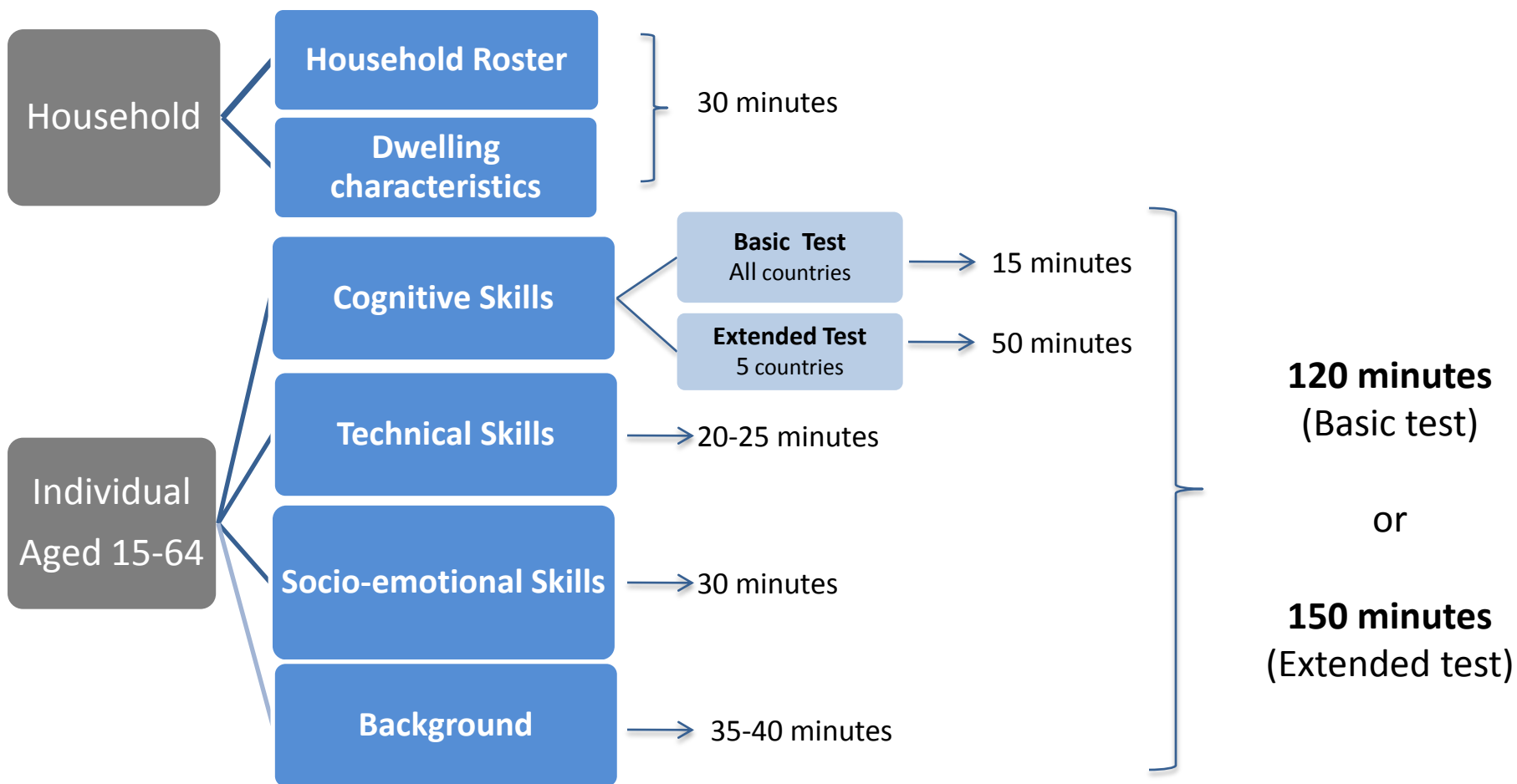
Measuring Cognitive Skills

❑ **Direct Assessment**

- Test of reading literacy developed by the Education Testing Service (ETS)
- Results are scored on the same scale as OECD's PIAAC
- Test has three parts: Core, Reading Components and Exercise Booklets

    Example test item:
    » Read the label on a medicine bottle and answer "What is the maximum number of days you should take this medicine?" and "List three situations for which you should consult a doctor"

❑ **Self-Reported Assessment**

- Measures of literacy and numeracy

    Example questions
    » Do you ever have to read anything, even very short notes or instructions that are only a few sentences long?
    » Do you have to read bills, financial statements, or forms?
    » Do you have to measure or estimate sizes, weights, distances, etc.?
    » Do you ever use or calculate fractions, decimals or percentages?
    » Do you ever use more advanced math, such as complex algebra, geometry, trigonometry, calculus, or inferential statistics?

Measuring Socio-Emotional Skills

❑ Self-Reported Assessment
- Assessment of social literacy, including personality traits and behaviors
- Big Five Inventory, GRIT, Decision-making, hostility bias
- Time and risk preferences

Examples

On a scale of 1 to 5, "I see myself as someone who:
— finish whatever I begin"
— get nervous easily"
— think about how the things I do will affect others"
— sometimes can't stop myself from doing something, even if I know it is wrong"
— ...pursues my goals in spite of setbacks"
— ...is almost certain to make my plans work."
— ...can be somewhat careless."
— ...is inventive."
— ...starts quarrels with others."
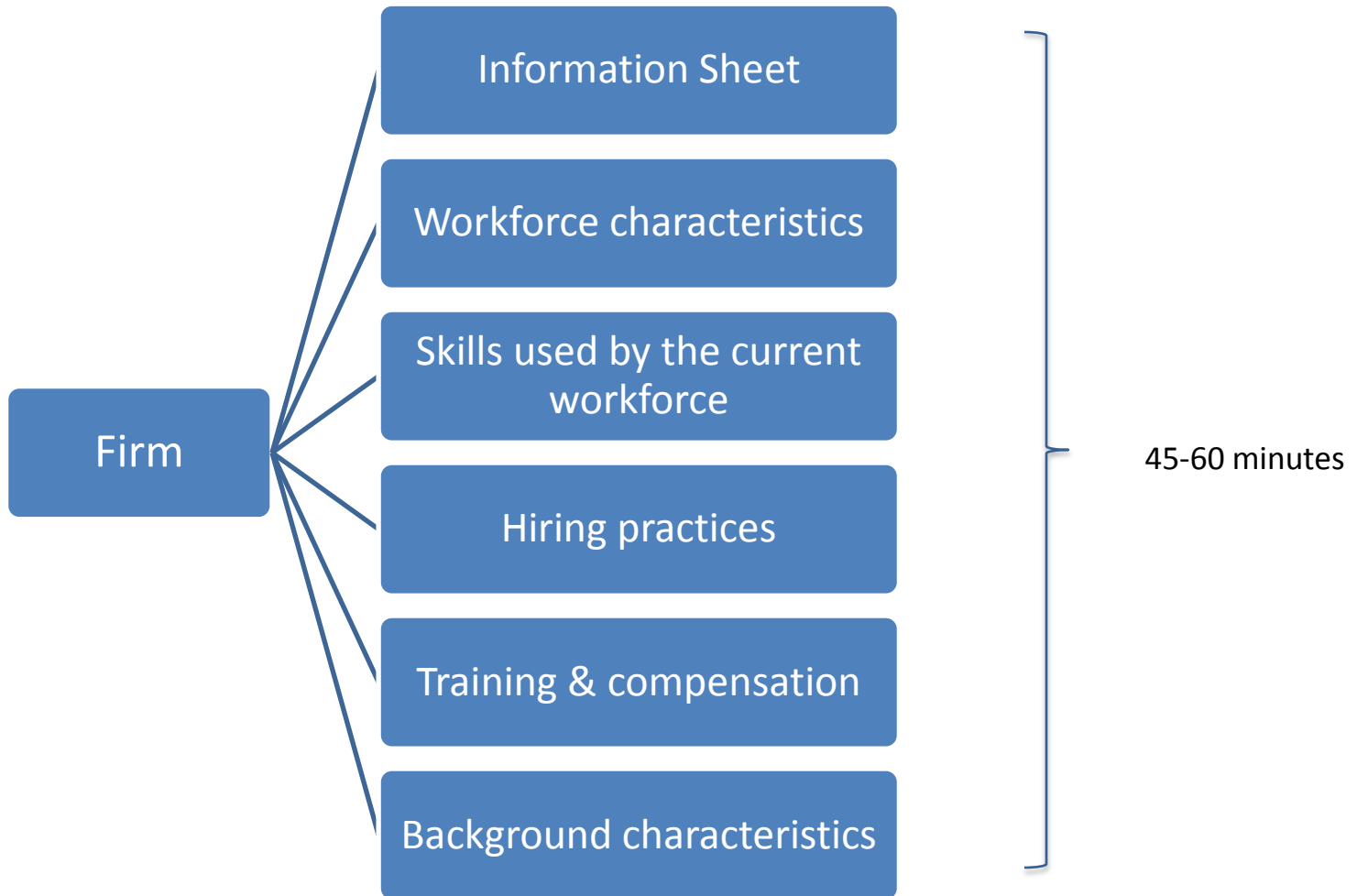
Measuring Technical Skills

❑ Self-reported Assessment

- Measures of competence to perform defined tasks

  Examples

  — As part of your work, do you use a computer to do data entry or fill out forms?

  — How much of your workday is spent doing physical tasks such as standing, handling objects, operating machinery or vehicles, or making or fixing things with your hands?

  — "As a part of your work do you regularly supervise the work of other employees?"

STEPs| Employer Survey

Firm

- Information Sheet
- Workforce characteristics
- Skills used by the current workforce
- Hiring practices
- Training & compensation
- Background characteristics

45-60 minutes

The StEPs Employer Survey - Sampling

- Complicated in countries with large informal sectors
  - Register data does not cover these employers
  - They can make up a very large share of employment
  - If you do not cover informal employers, you get a biased picture

- Three options for sampling
  - Employers mentioned in HH survey
    - Reporting errors
    - Extra complexity for sampling (not necessarily contiguous)
    - Questionnaire must be modified slightly to obtain necessary information
  - Register data
    - If number of unregistered employers is small (unlikely in most developing countries)
  - Door-to-door
    - Can use the HH enumeration if the enumeration areas are randomly chosen (not focusing on residential areas)
    - Otherwise can be costly: Urban only?

The StEP Employer Survey Structure of the workforce

	(A) Number of current employees	(B) Number of employees 12 months ago	(C) Projected number 12 months from now	Problems encoutered hiring (mark all that apply)				
				(D) No or few applicants	(E) Applicants lack required skills	(F) Applicants expect wages higher than we can offer	(G) Applicants do not like working conditions	(H) Other (specify)
Managers								
Professionals								
Technicians and associate professionals								
Clerical support workers								
Service workers								
Sales workers								
Skilled agricultural, forestry and fishery workers								
Craft and related trades workers								
Plant and machine operators, and assemblers								
Elementary occupations								

The StEP Employer Survey
Skills used

- Cognitive skills
  - *"Does their job ever involve reading?"*
  - *"Does their job ever involve writing using correct spelling and grammar?"*
  - *"Does their job ever involve maths, that is, adding, subtracting, multiplying or dividing numbers - using a calculator or computer if necessary?"*
  - *"Does their job ever involve solving problems that take 30 minutes or more of thinking time to find a good solution?"*
- Technical skills
  - *"What is the highest level of computer use is needed in this job?"*
- Non-cognitive skills
  - *"Does their job ever involve speaking of a language other than [OFFICIAL LANGUAGE OF AREA IN WHICH WORKPLACE IS BASED]?"*
  - *"Does the job ever require presenting logical arguments?"*
  - *"Does their job ever involve interacting with a team of co-workers?"*
  - *"What percentage of the days in a month does the worker arrive at work on time (within 15 minutes)?"*
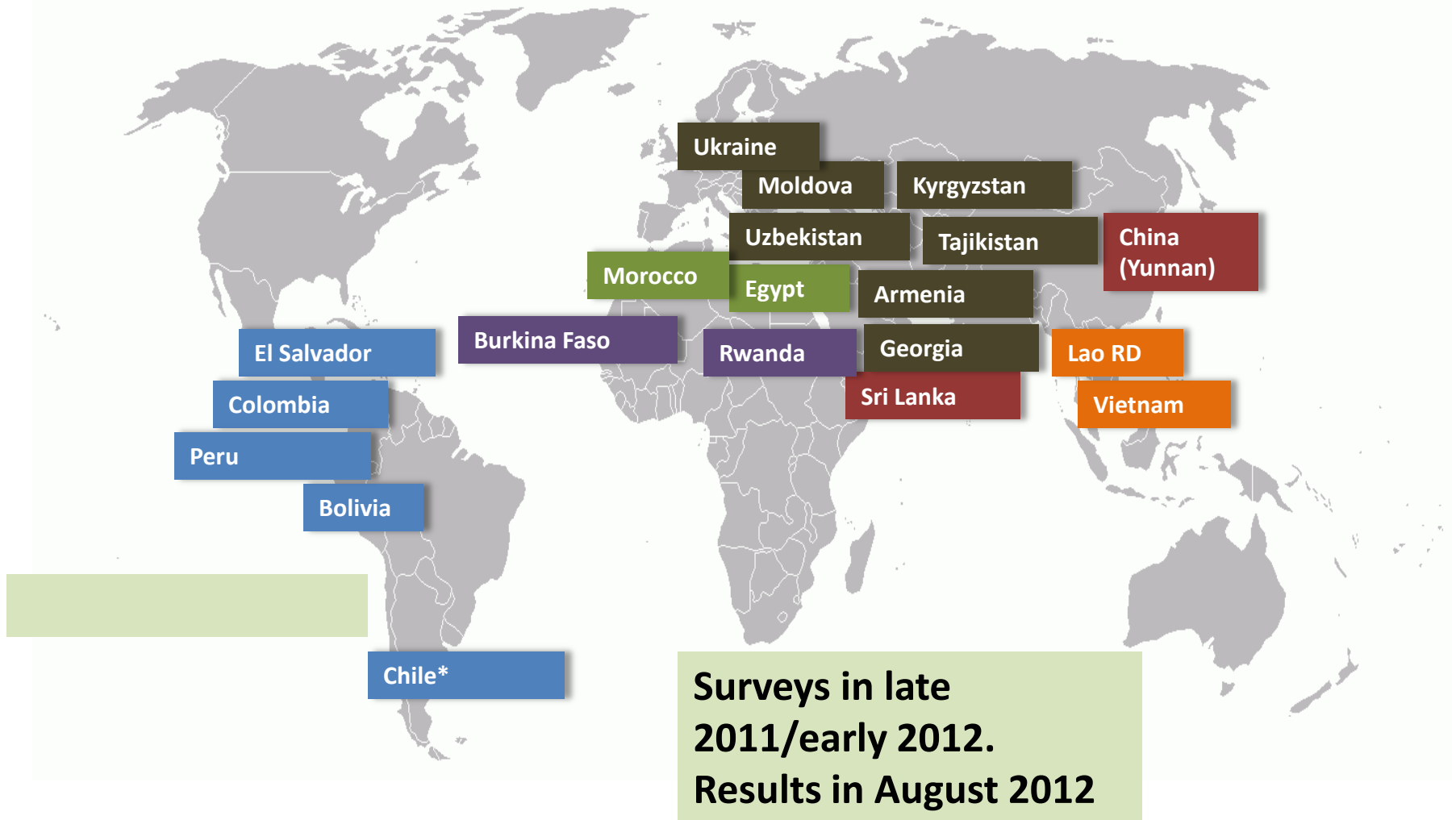
The StEP Employer Survey
Hiring practices

- *"Please indicate the importance you attach to the following _____ when deciding which new employees should be retained after an initial trial period"*
  - Characteristics (Age, gender, appearance)
  - Skills (Various cognitive and technical skills)
  - Attitudes (Big-5 non-cognitive skills)
- Description of hiring procedures
  - Geographic scope of hiring
  - Days of post-hiring training required
  - Number of days a vacancy remains open
  - Number of offers needed to hire one worker
  - Are skills shortages filled by contractors?
  - Is salary negotiable?

The STEPs Employer Survey
Training and compensation

- Training questions
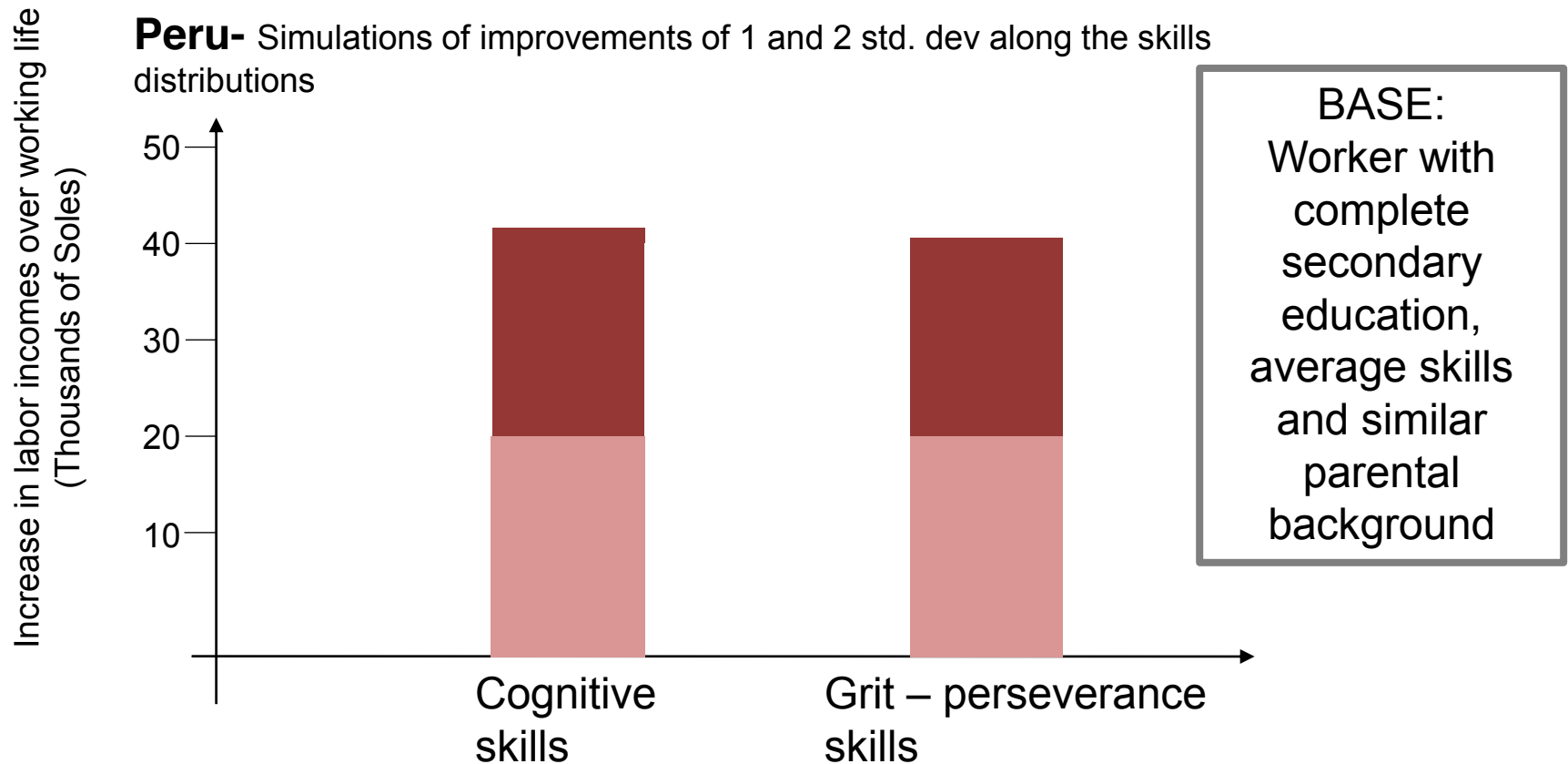 - Contact with educational and training institutions
  - Share of employees who received training
  - Spending on training
  - Employee hours devoted to on-the-job training
- Employer's suggestions for improving educational and training systems
- Characteristics that affect compensation or chances of promotion
  - Same cognitive, technical and non-cognitive skills as in hiring module

STEPs and other Skills surveys (of both cognitive and non-cognitive skills)

Ukraine

Moldova

Kyrgyzstan

Uzbekistan

Tajikistan

China (Yunnan)

Morocco

Egypt

Armenia

Burkina Faso

Rwanda

Georgia

Lao RD

El Salvador

Sri Lanka

Vietnam

Colombia

Peru

Bolivia

Chile*

Surveys in late 2011/early 2012. Results in August 2012

Example (1). Linking skills to employability in Peru: Labor market rewards perseverance as much as cognitive ability (beyond educational achievement)

Peru- Simulations of improvements of 1 and 2 std. dev along the skills distributions

BASE: Worker with complete secondary education, average skills and similar parental background

Increase in labor incomes over working life (Thousands of Soles)

Cognitive skills	Grit – perseverance skills

Source: Díaz, Arias and Vera Tudela (2010) based on Peru Skills Survey.

http://siteresources.worldbank.org/INTPERUINSPANISH/Resources/PeruSkillsLaborReportMay242011.pdf

Ex(1): Cognitive skills and Grit more important for college access than financial constraints in Peru

Change in probability of tertiary education enrollment
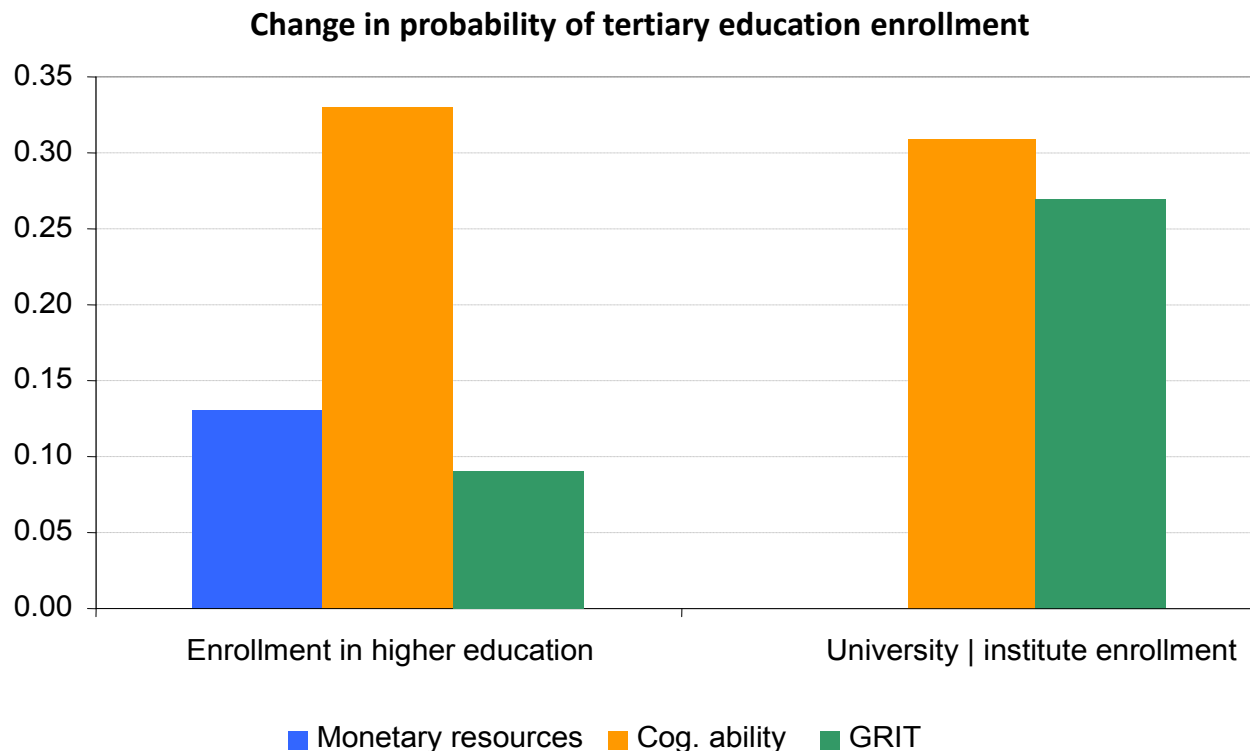
(*) Increasing monetary resources implies changing self-reported socioeconomic status at the time of secondary schooling from low to medium class; increasing abilities implies moving from the bottom to the upper third of the ability distribution.

Note: Simulations from bivariate probit regressions: Eq1: 1= pursued tertiary education, 0=otherwise; Eq2: 1= enrolled in college, 0= enrolled in technical/non-university. Controls for individual and family factors such as gender, ethnic group, parental/family background, reported SES and scholastic performance during secondary schooling and. Wald test of indep. Eqns: Prob > chi2 =   0.0063

Ex (2): Firms in Armenia highlight that soft skills are as important as other skills

Armenian firms in hospitality industry, 2007

Y-axis: 1 = not important, 4 = extremely important

Categories (with approximate values):

Knowledge
- Health and safety rules: 3.1
- Armenian history/ culture: 2.7
- Environmental awareness: 2.5
- Procurement: 2.1

Cognitive skills
- Foreign language skills: 3.4
- Problem solving skills: 3.0
- Writing skills: 2.5

Soft skills
- Customer service skills: 3.3
- Communication skills: 3.2
- Team Working Skills: 2.9
- Showing initiative: 2.9
- Innovation and creativity: 2.9
- Leadership: 2.7
- Telephone skills: 2.7
- Entrepreneurial skills: 2.6

Technical skill
- Quality management skills: 2.7
- IT skills: 2.7
- Sales and marketing: 2.6
- Web design/maintenance: 2.4
- Product development skills: 2.3
- Accountancy and budgeting: 2.3
- Pricing: 2.3
- Administrative skills: 2.2

Ex(3): Demand for skills vary by sector and firm type in Indonesia

Behavioral skills are in higher demand in the service sector, with particular focus on communication and leadership skills
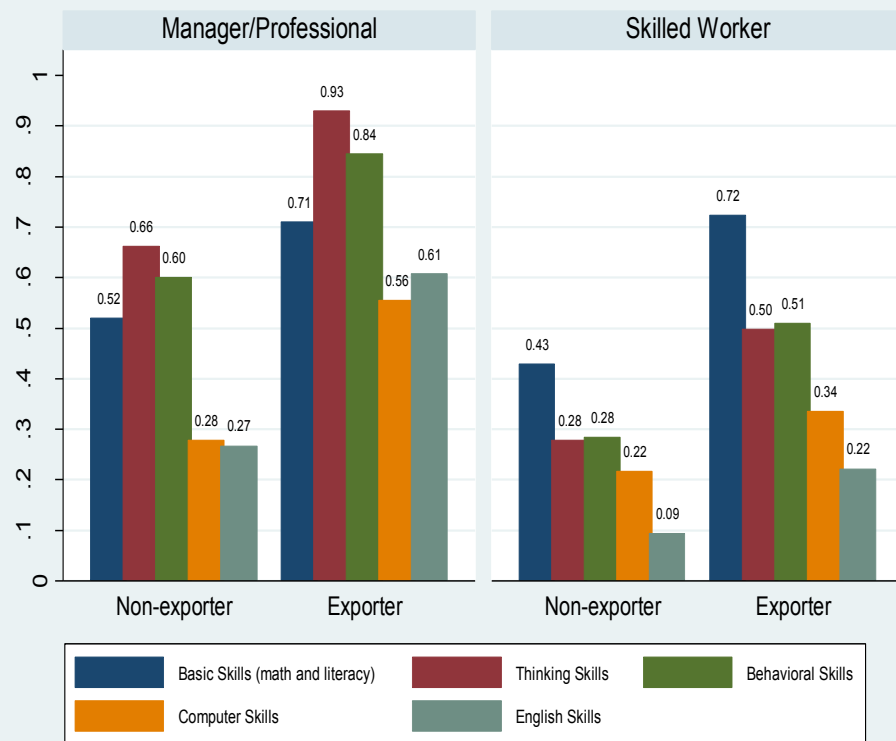
All generic and academic skills are in higher demand in the exporting sector

Share of firms rating workers' behavioral skills 'very important'
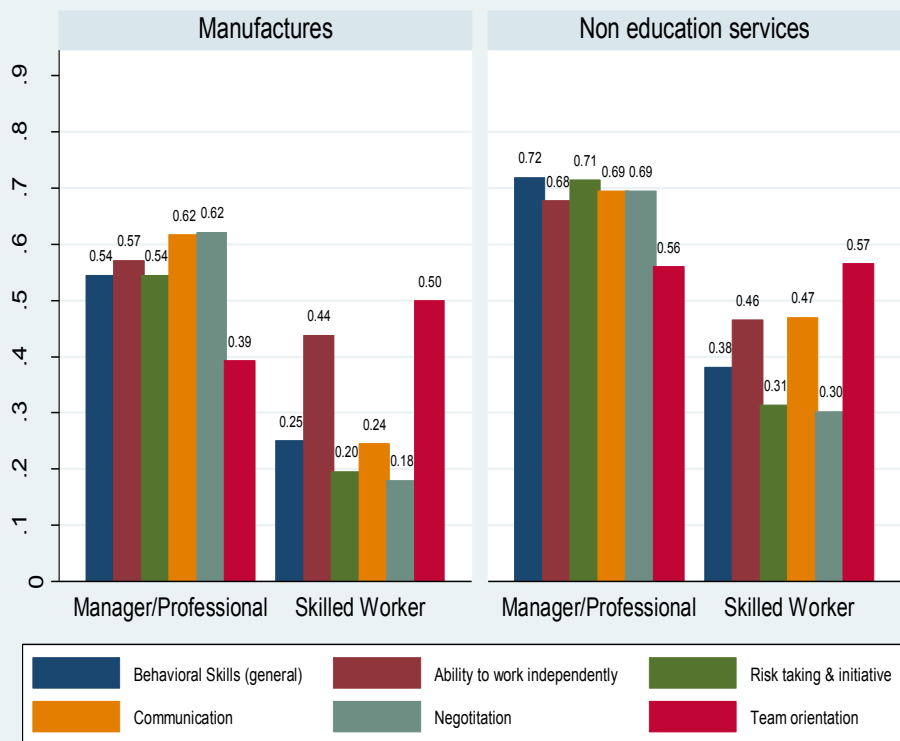
Source: Employer Skill Survey (2008)

Share of firms rating workers' skills 'very important'

Source: Employer Skill Survey (2008)

Ex (4): Employability and Skill Set of Newly Graduated Engineers in India

- *Core Employability Skills*: Highest level of importance (highest demand)
- *Technical Skills*: Important, but less than the others
- Core Emp vs. Tech Skills: t(152)=8.9539, p<0.001
- Comm vs. Tech Skills: t(149)=2.4696, p<0.0147

SOFT SKILLS				TECHNICAL SKILLS	
Core Employability	**Mean**	**Communication Skills**	**Mean**	**Technical Skills**	**Mean**
Integrity	4.48	Communication in English	4.26	Use of modern tools	4.08
Reliability	4.42	Written Communication	4.07	Apply knowledge Math/Sci/Engg	4.07
Teamwork	4.41	Reading	4.04	Creativity	4.07
Willingness to learn	4.40	Technical Skills	4.02	Problem solving	3.93
Entrepreneurship	4.35	Experiments/data analysis	4.01	System design to needs	3.84
Self-discipline	4.26	Verbal Communication	4.00	Contemporary issues	3.83
Self-motivated	4.22	Basic computer	3.95	Customer Service	3.51
Flexibility	4.15	Advanced computer	3.71		
Understand/take directions	4.14				
Empathy	3.92				
Average	**4.27**	**Average**	**4.01**	**Average**	**3.91**

Ex(4): Skill Gaps among engineers in India

- Skill Gaps = Importance – Satisfaction (from self-reports of employers)
- Largest skill gaps: "Reliability", "Self-motivated"
- Smallest skill gaps: Communication in English
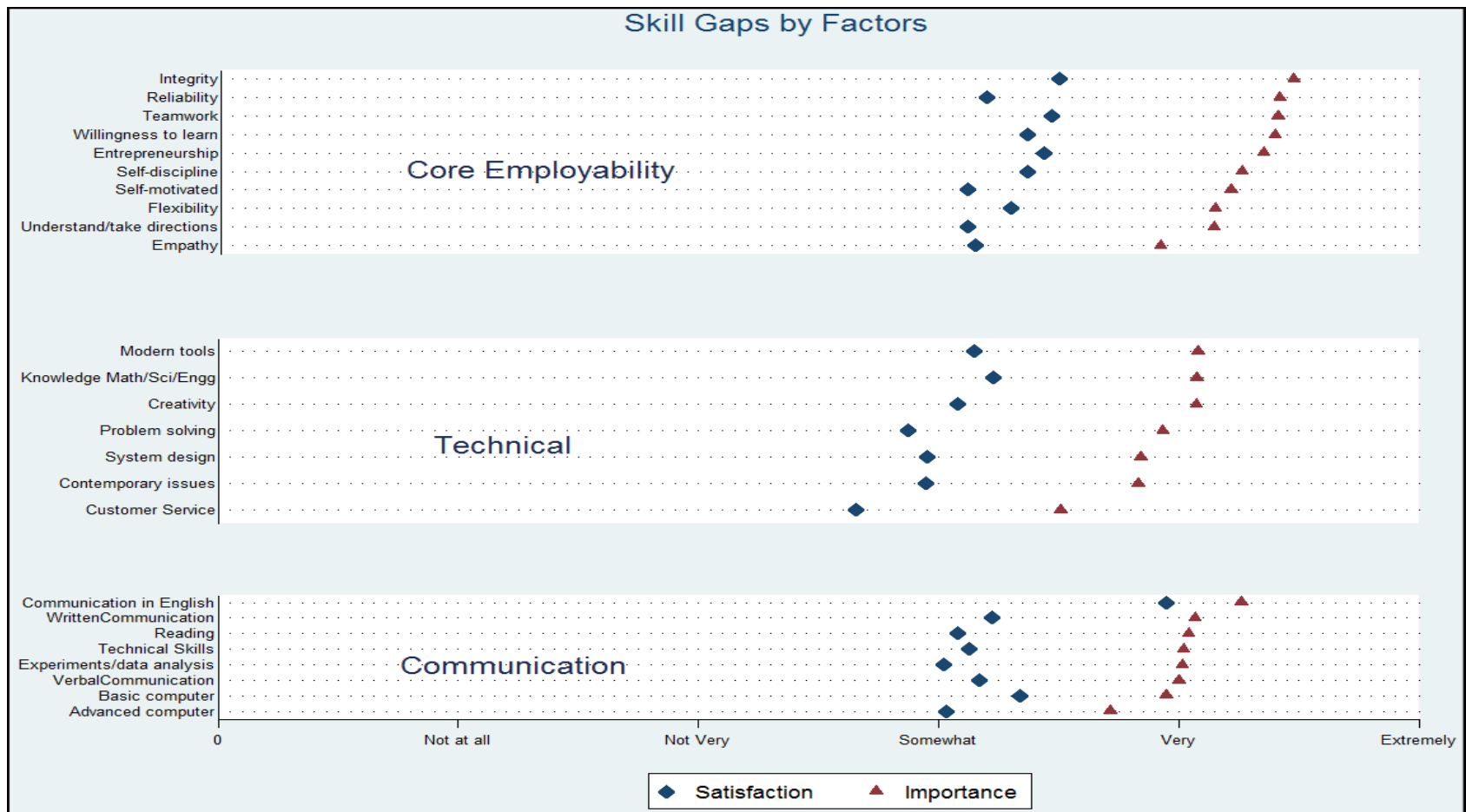
Benchmarking Systems for Workforce Development

Highlights of SABER

❑ **Objective:**

- Support World Bank partner countries to examine and improve policies affecting system performance

❑ **Approach:**

- Systematically document policies and institutions
- Benchmark against evidence-based global standards
- Foster dialogue and action on reforms

❑ **Policy Domains in SABER:**

- Workforce Development (WfD)
- Others (e.g., teachers, assessment, ECD)
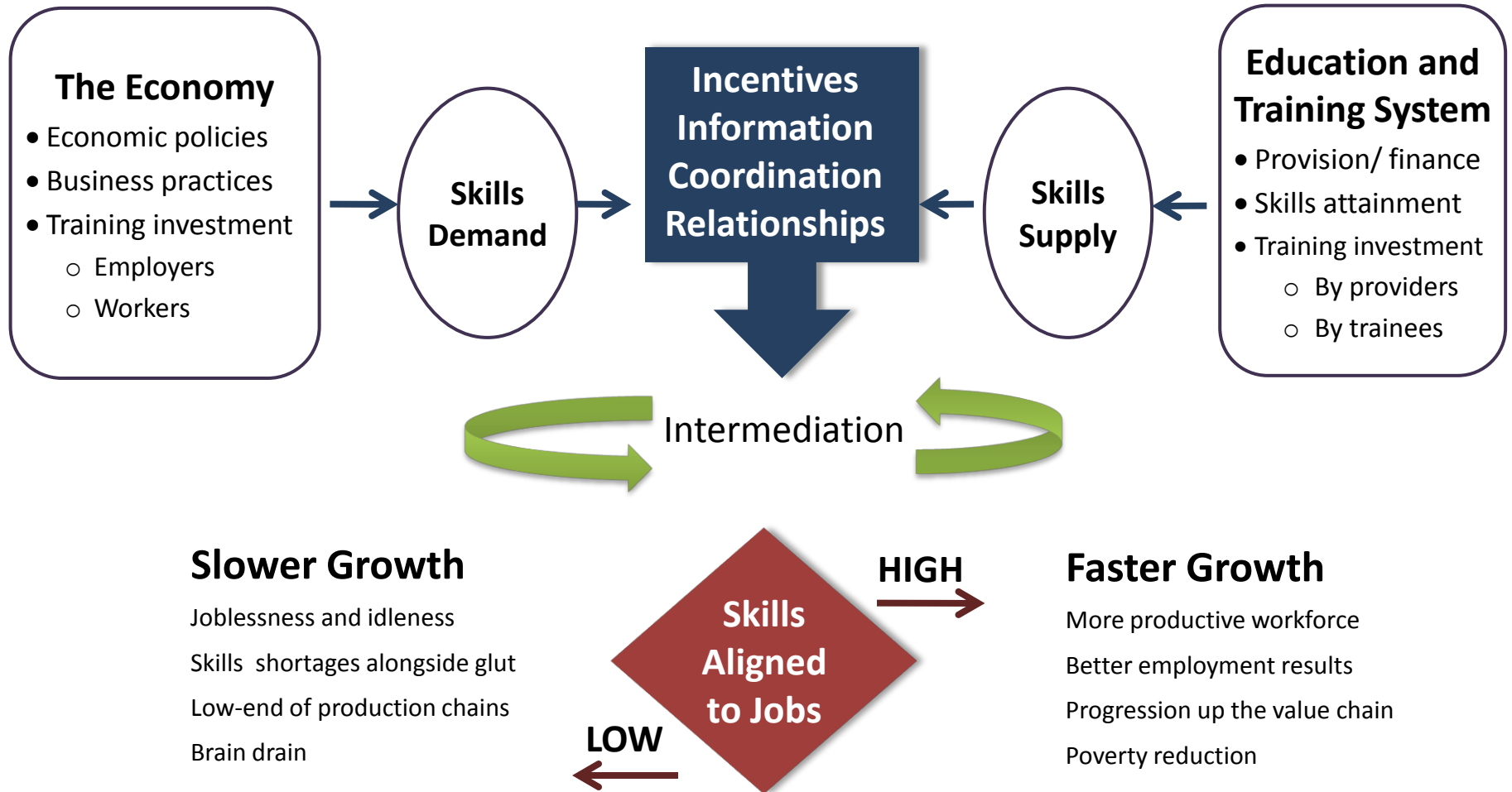
What SABER Will and Won't Do

Will:

- Offer framework and diagnostic tool
- Facilitate comparisons
- Highlight areas for improvement
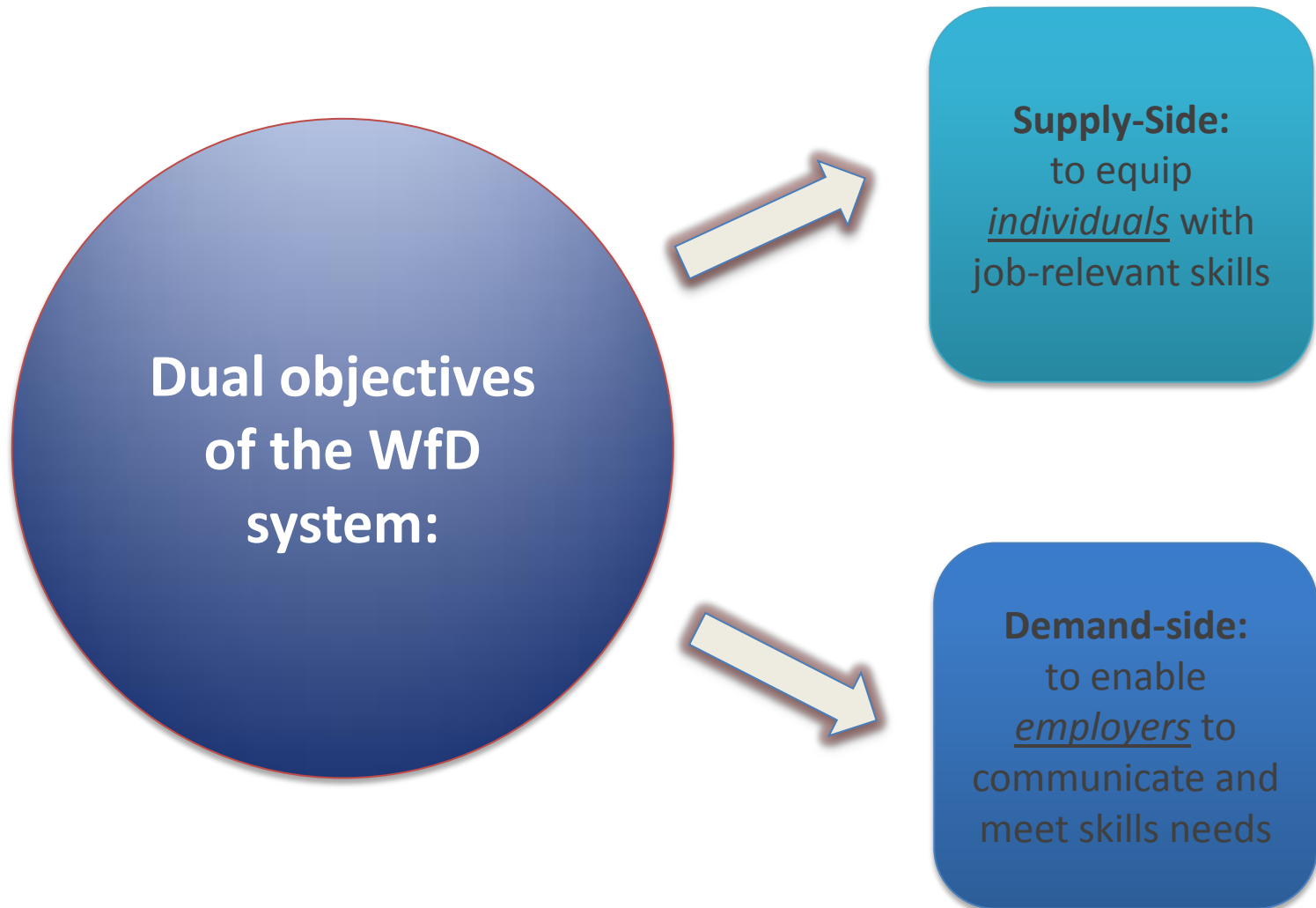- Inform policy dialogue
- Guide future research

Won't:

- Replace in-depth sector studies
- Rank countries
- Offer a one-size-fits-all solution

SABER-WfD: Start with the Big Picture

The Economy
- Economic policies
- Business practices
- Training investment
  - Employers
  - Workers

Skills Demand

Incentives Information Coordination Relationships

Skills Supply

Education and Training System
- Provision/ finance
- Skills attainment
- Training investment
  - By providers
  - By trainees

Intermediation

Skills Aligned to Jobs

HIGH

LOW

Slower Growth

Joblessness and idleness

Skills shortages alongside glut

Low-end of production chains

Brain drain

Faster Growth

More productive workforce

Better employment results

Progression up the value chain

Poverty reduction

Workforce Development Objectives

Dual objectives of the WfD system:

Supply-Side: to equip *individuals* with job-relevant skills

Demand-side: to enable *employers* to communicate and meet skills needs

Motivating Design of SABER-WfD Tool

❑ **Skills misalignment and skills gaps result from:**

    ❑ Market imperfections

    ❑ Government flaws

| **Governance** | **Finance** | **Information** |

SABER-WfD assesses countries' policies and institutions to address these flaws

Hypotheses Guiding Focus of SABER-WfD

Hypotheses

- Multiple potential weak links exist in policies for WfD

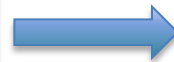- Smart policies alone are insufficient; implementation matters too

- "Learn-to-Do" and "Do-to-Learn" mindset gives feedback for improvement

Implications

- Collect comprehensive yet specific data

- Document not just the *de jure* situation

- Look for evidence of learning

Functional Dimensions in SABER-WfD Tool

Strategy

Aligning WfD to national goals for productivity

Delivery

Managing for tangible results on the ground

Oversight

Governing to achieve desired goals
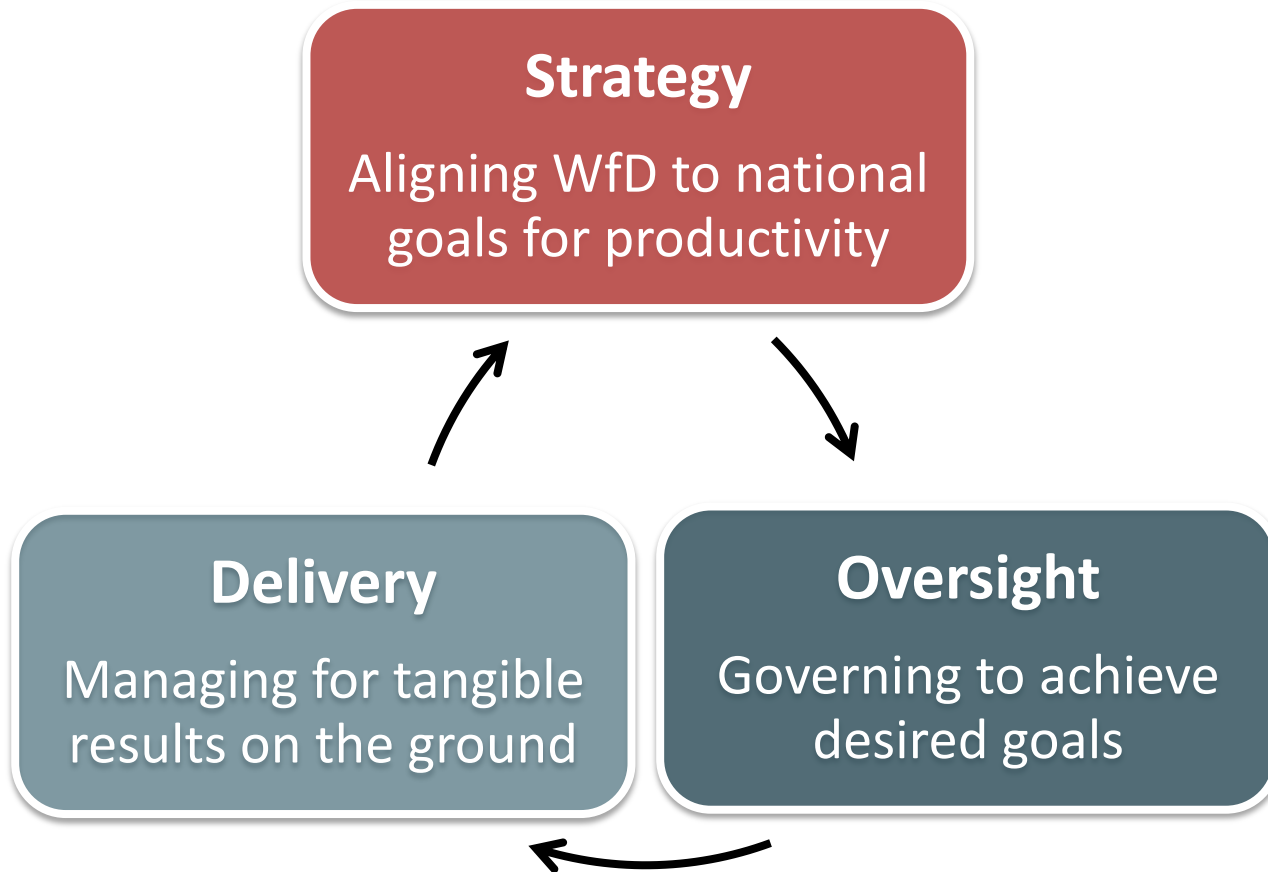
For each Dimension:
Drill Down to Policy Goals and Actions

Strategy	Oversight	Delivery
Direction	Pathways	Content
Priorities	Resources	Incentives
Coordination	Standards	Outcomes
9 actions	**9 actions**	**9 actions**
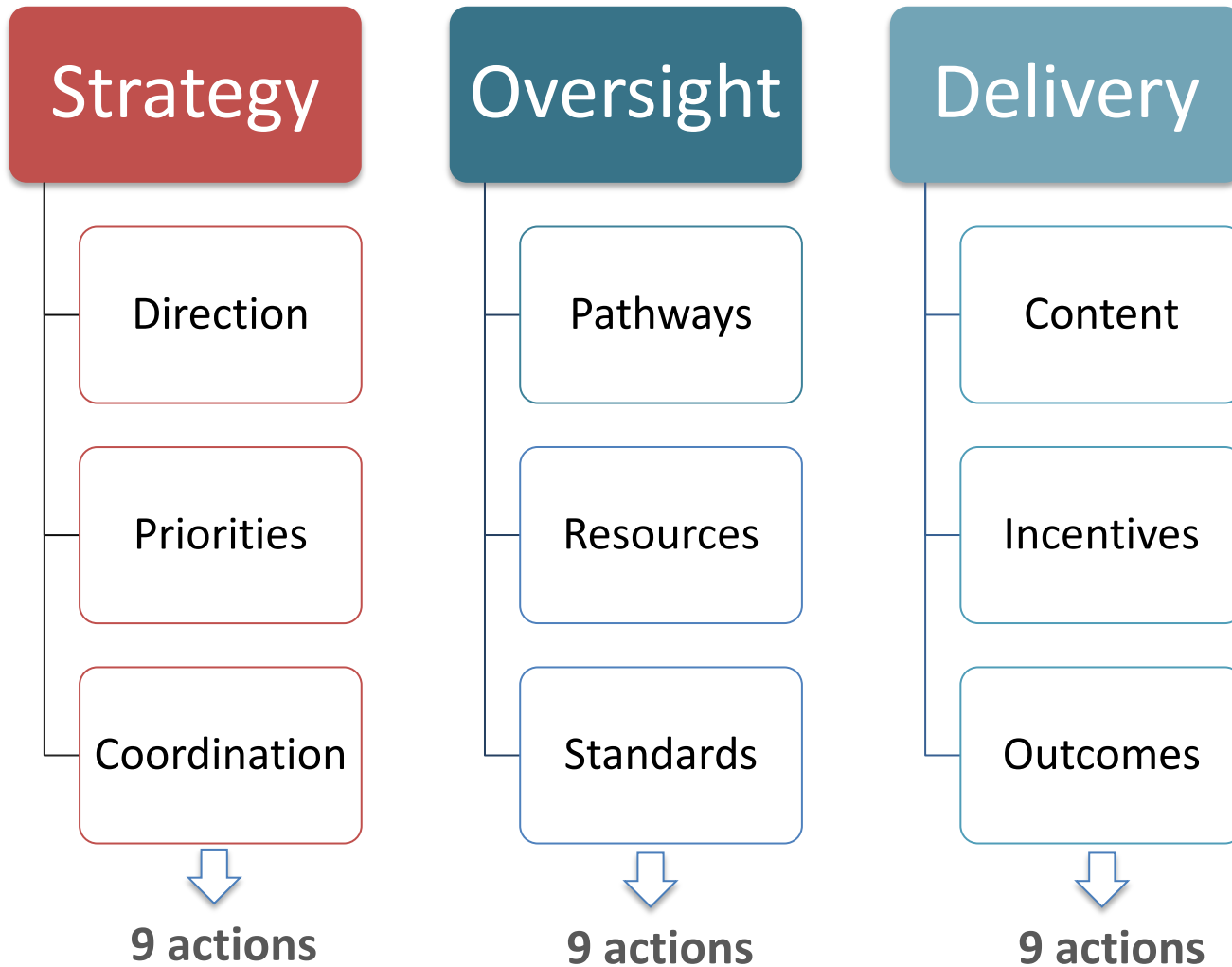
Examples of Policy Actions

Dimension

Strategic Framework

Policy Goal

Direction

Policy Actions

Advocate for WfD as a priority for economic development

Evaluate economic prospects and its implications for skills
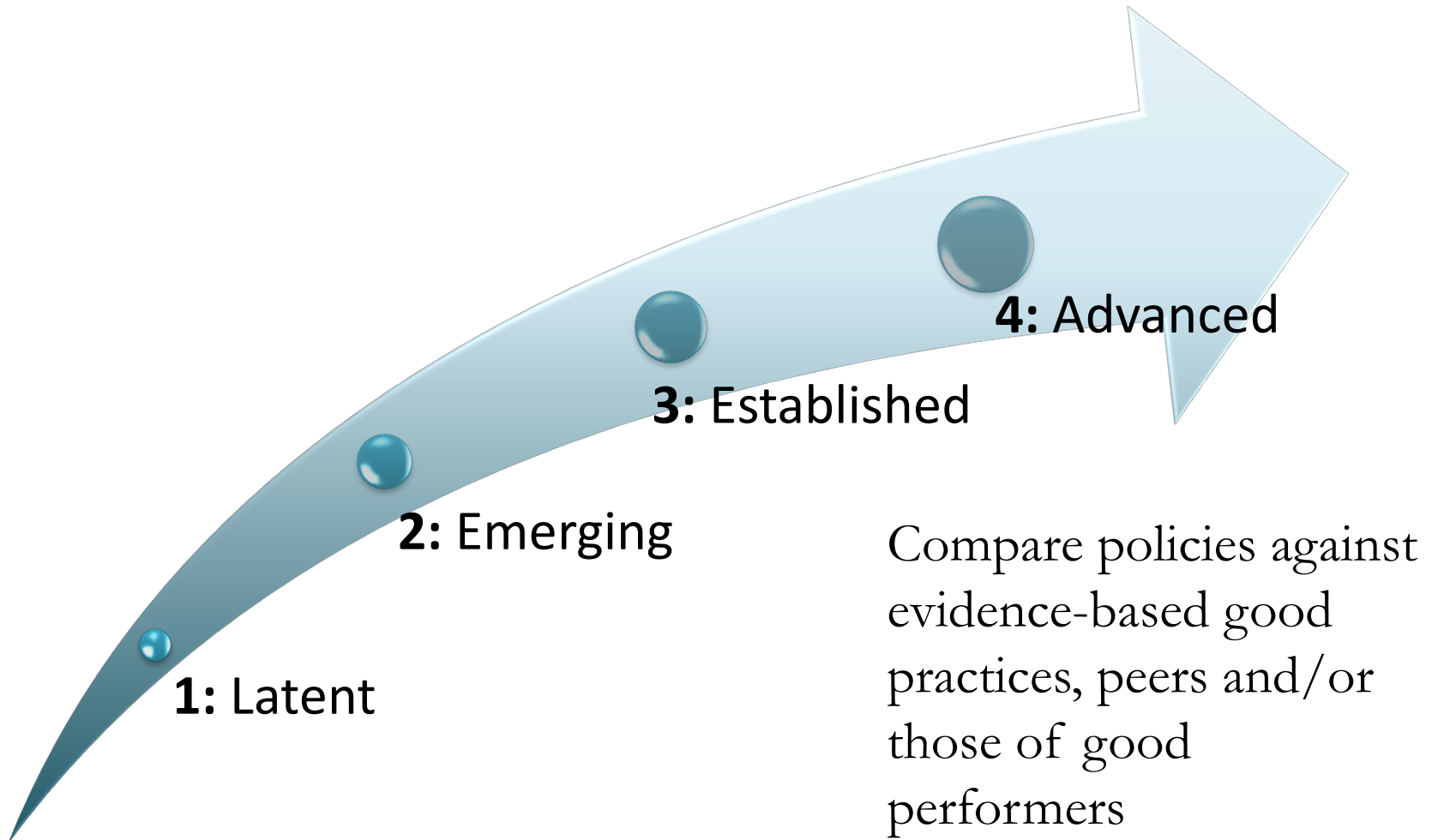
Develop policies to align skills demand and supply
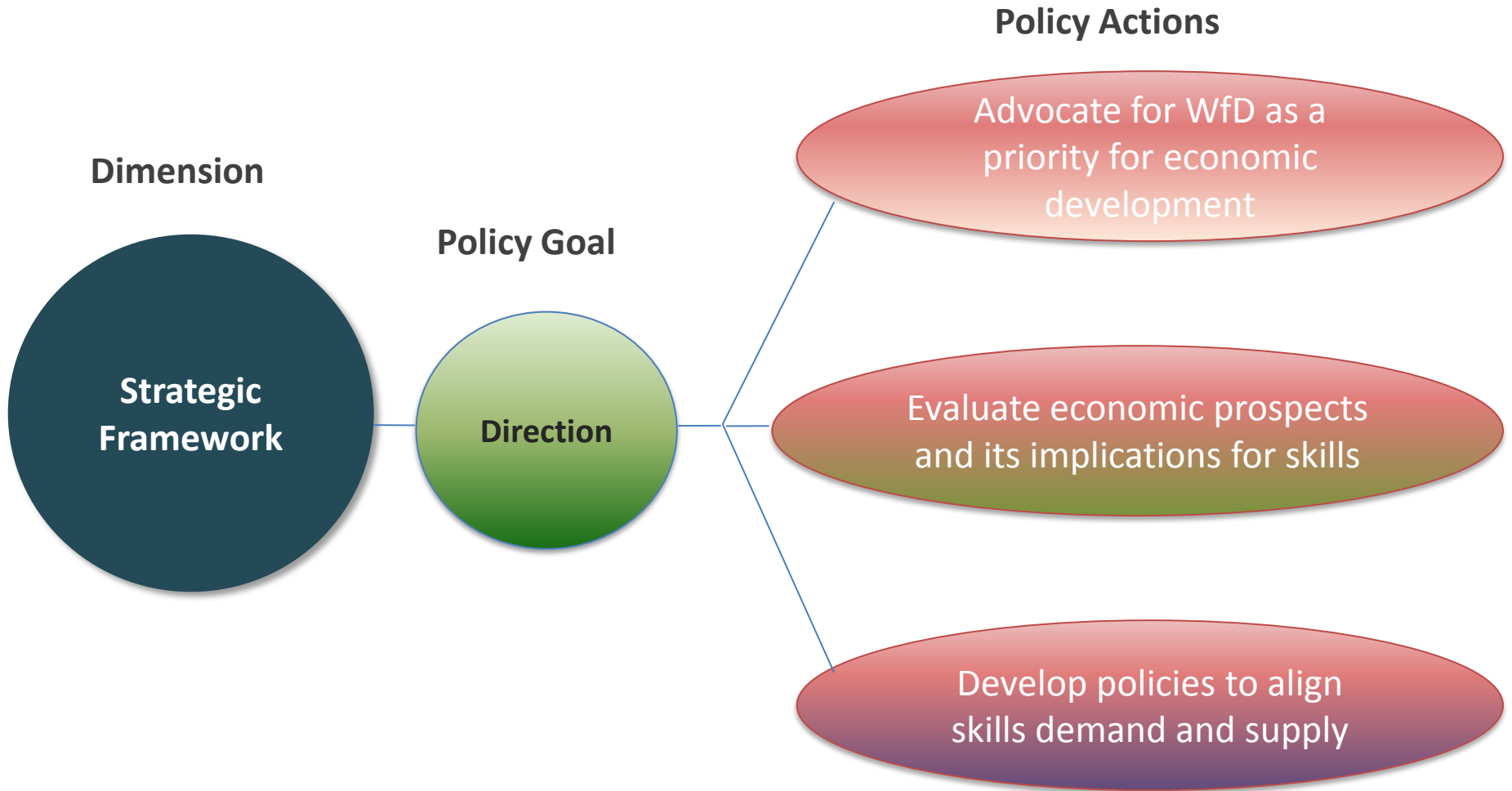
Data Collection

- <u>Questionnaire</u> to systematize data gathering

- <u>Documentary evidence</u> to substantiate data

- <u>Credible informants</u> to fill data gaps and validate data

- <u>Data accuracy</u> critical

Data Analysis: Rubrics for Benchmarking

4: Advanced

3: Established

2: Emerging

1: Latent

Compare policies against evidence-based good practices, peers and/or those of good performers
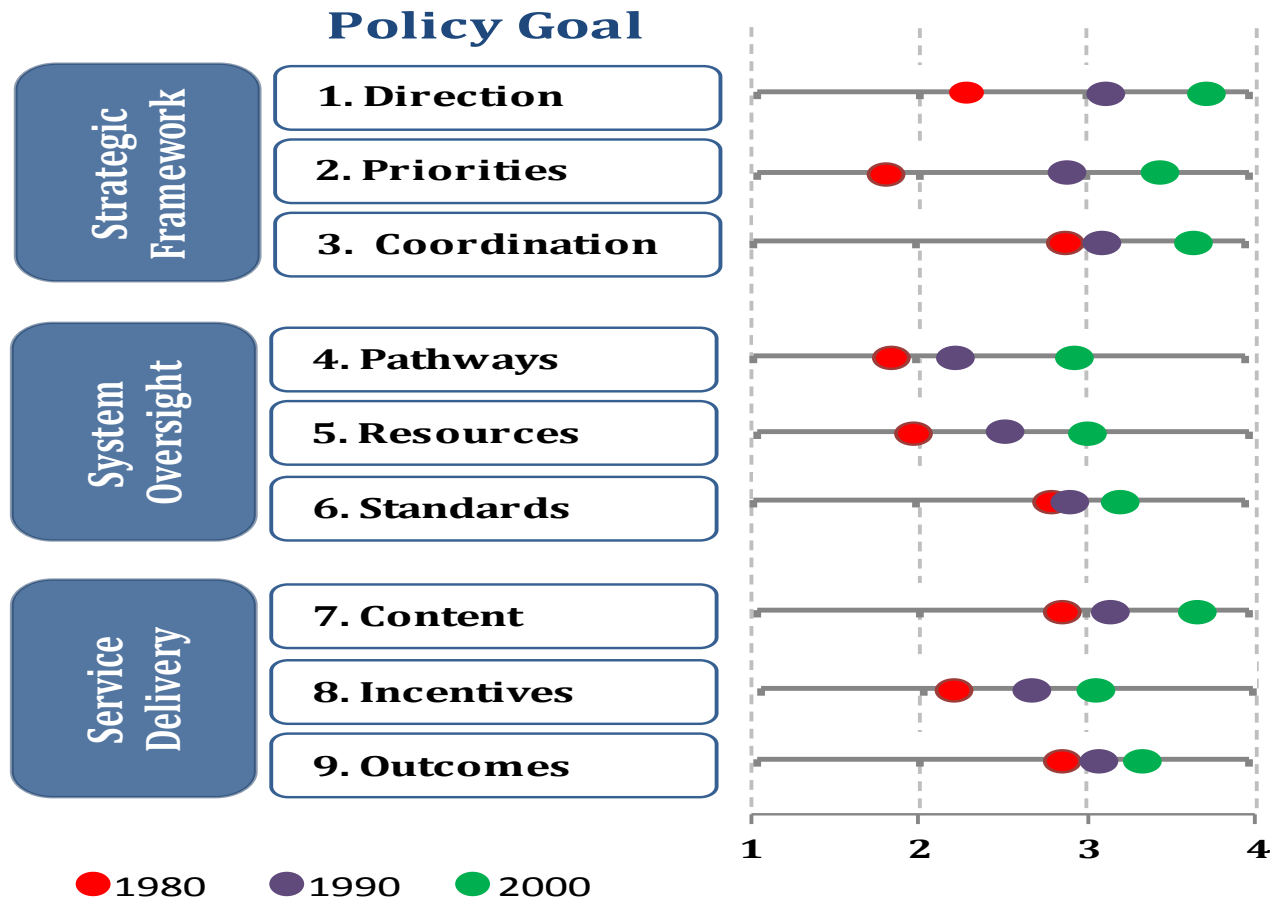
Piloting the Approach: Case Studies

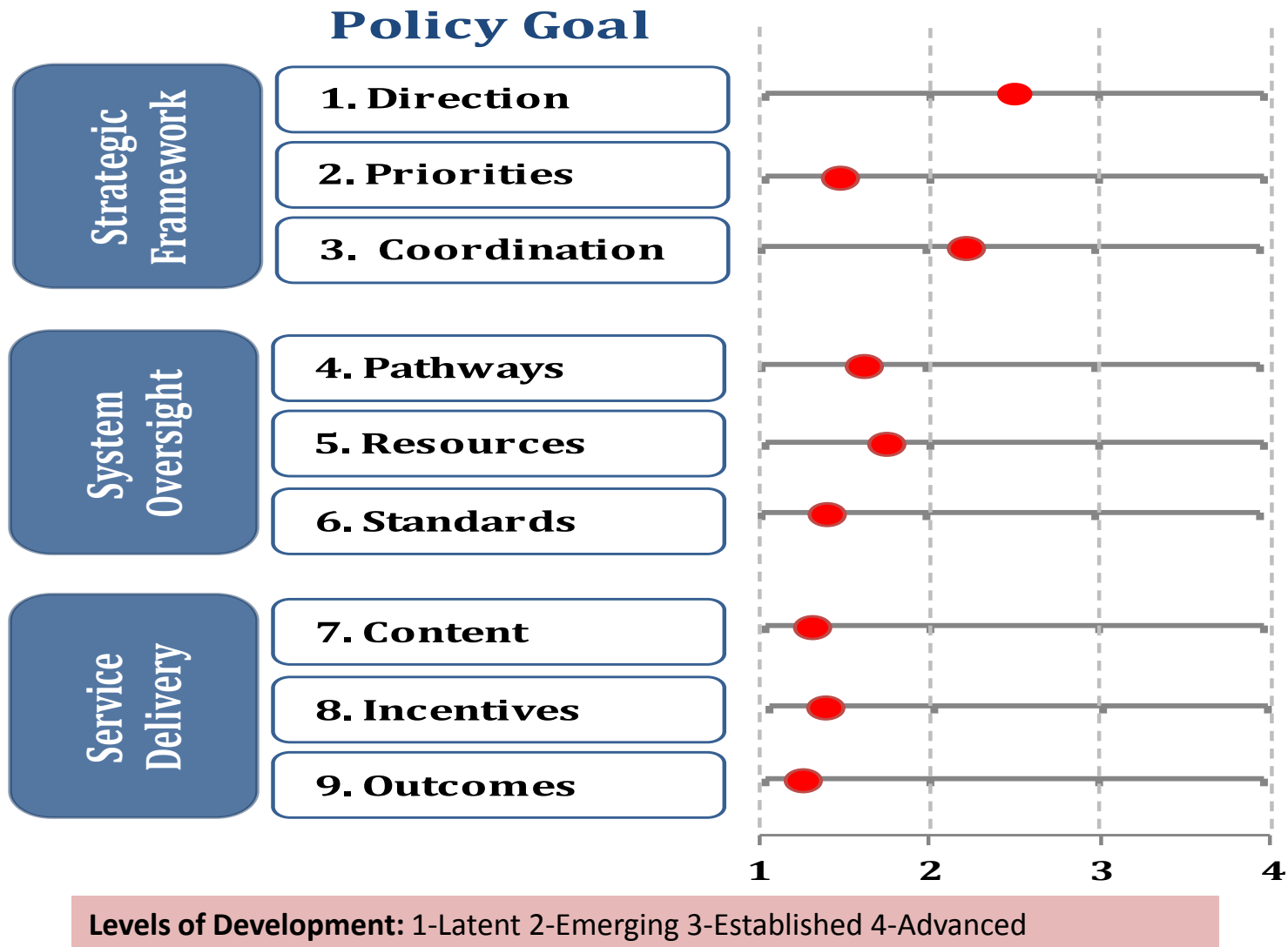|	1970	1980	1990	2000	2010
Chile				✓	✓
Ireland		✓	✓	✓	
Singapore	✓		✓		✓
Korea	✓		✓		✓
Uganda					✓

Documenting Progress Over Time

Ireland Example: 1980, 1990, 2000

Levels of Development: 1-Latent 2-Emerging 3-Established 4-Advanced

Snapshot of All Three Dimensions

Uganda 2011

Policy Goal

Strategic Framework	System Oversight	Service Delivery
1. Direction	4. Pathways	7. Content
2. Priorities	5. Resources	8. Incentives
3. Coordination	6. Standards	9. Outcomes

Levels of Development: 1-Latent 2-Emerging 3-Established 4-Advanced

Short Report for Policy Dialogue and Action

SABER – Workforce Development
Barometer Report | Uganda 2011

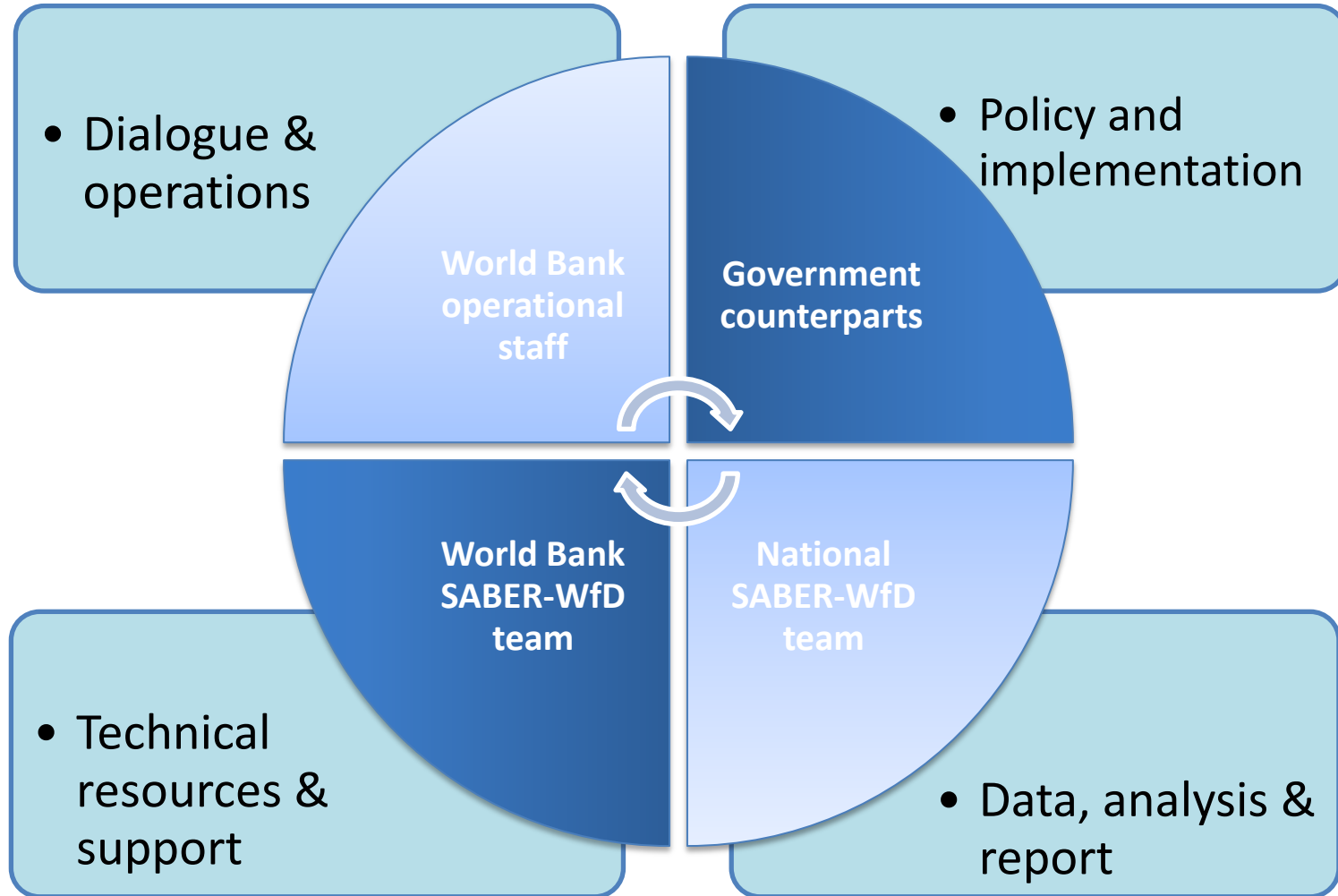**Strategy**   **Oversight**   **Delivery**

Beyond the First Cohort

❑ **Disseminate the Barometer Reports**

❑ **Refine SABER-WfD instruments**

❑ **Streamline for scaling up**

❑ **Foster capacity building and learning**

Second Generation Countries

- China (Yunnan Province)
- Malaysia
- Turkey
- Vietnam

Organizing for SABER-WfD Application:
A Partnership Model in Each Country

- Dialogue & operations

- Policy and implementation

World Bank operational staff

Government counterparts

World Bank SABER-WfD team

National SABER-WfD team

- Technical resources & support

- Data, analysis & report

Skills-Related Analytical Work at the Bank

- <u>Institutional flagship</u>: WDR 2013 on "Jobs" (ongoing)

- <u>Regional flagships</u> in all six World Bank regions:
  - **East Asia**: Putting Higher Education to Work
  - **Eastern Europe & Central Asia**: Skills, Not Just Diplomas
  - **Latin America & Caribbean**: Skills for the 21st Century
  - **South Asia**: More and Better Jobs
  - **Middle East & North Africa**: Opening up Job Opportunities for All (ongoing)
  - **Sub-Saharan Africa**: Youth Employment (ongoing)

- <u>Country studies</u>: many ongoing or completed

THANK YOU!

For more information contact:

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