Skill Mismatch and Over-qualification:
Why is vocational education necessary?

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KEY QUESTIONS

Skill demand and supply: How many university graduates are oversupplied?

Young people in education make choices. VET is optimal choice for students?

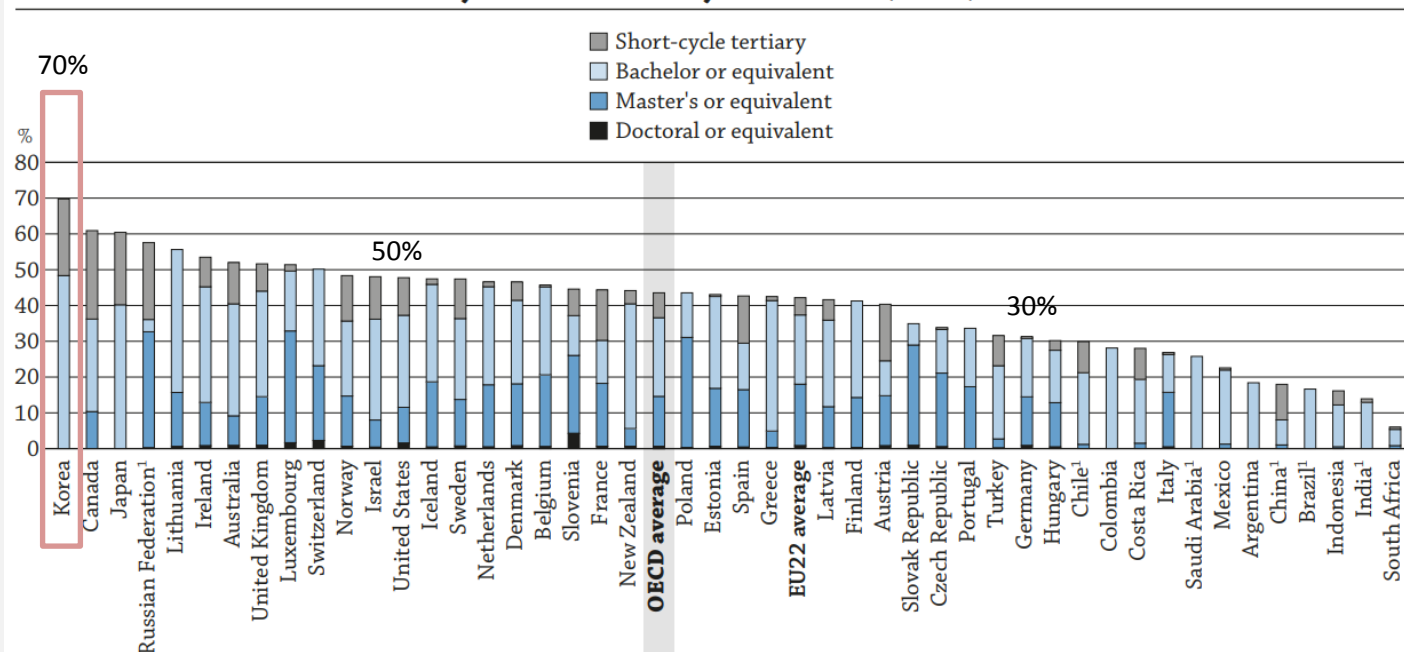Future of jobs and labor market still need VET graduates?

Q1.
Skill Demand and Supply :
Oversupply of graduates

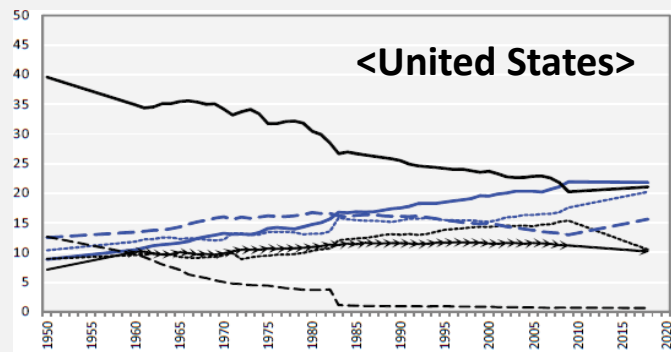# 70 percent of Korean youth have at least associate degree

World's fastest educational 'quantity' expansion. How about level of quality?

Figure A1.2. **Percentage of 25-34 year-olds with tertiary education, by level of tertiary education (2017)**
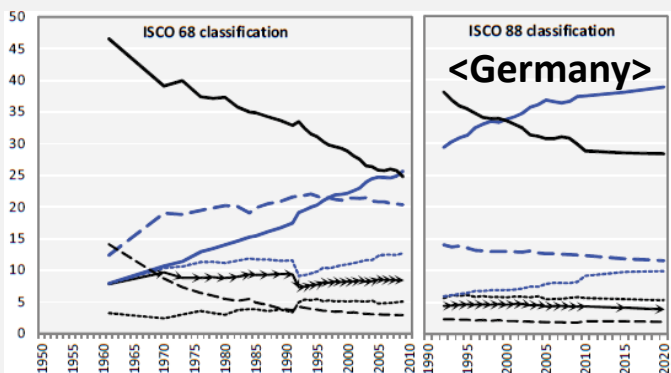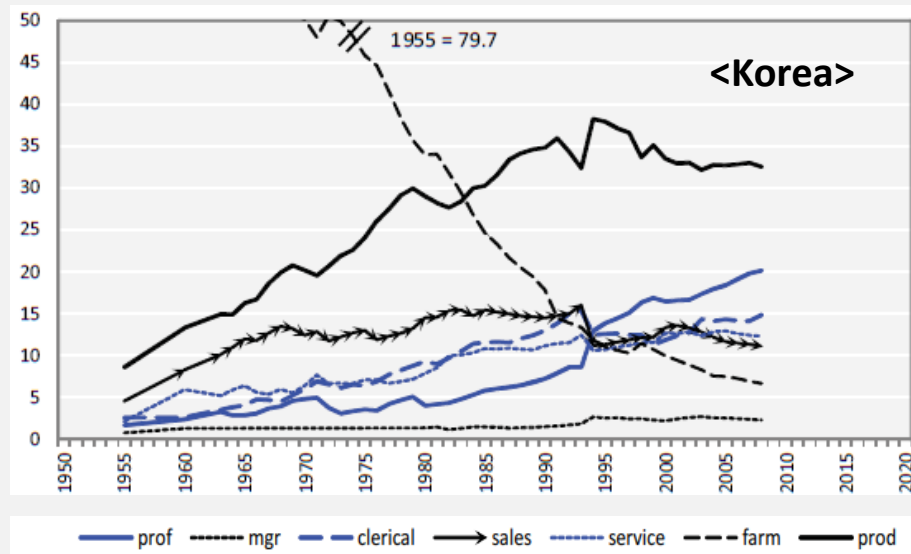
Trends in occupation shares

The Employment share of high-skilled white-collar jobs still lower than OECD average

\<United States\>

(P&M) 37.3%, (Prod) 20.3%

\<Germany\>

ISCO 68 classification

ISCO 88 classification

(P&M) 30.7%, (Prod) 24.8%

\<Korea\>

1955 = 79.7

prof ‑‑‑‑‑‑ mgr ‑‑‑ clerical ⟶ sales ‑‑‑‑ service ‑‑‑ farm — prod

o   professional and managers : ('60)3.7% →('09)**22.4%**

o   Production related: ('60) 13.3% → ('09)**32.6%**

Then where are today's youth in Korea?

Then where are today's youth in Korea?
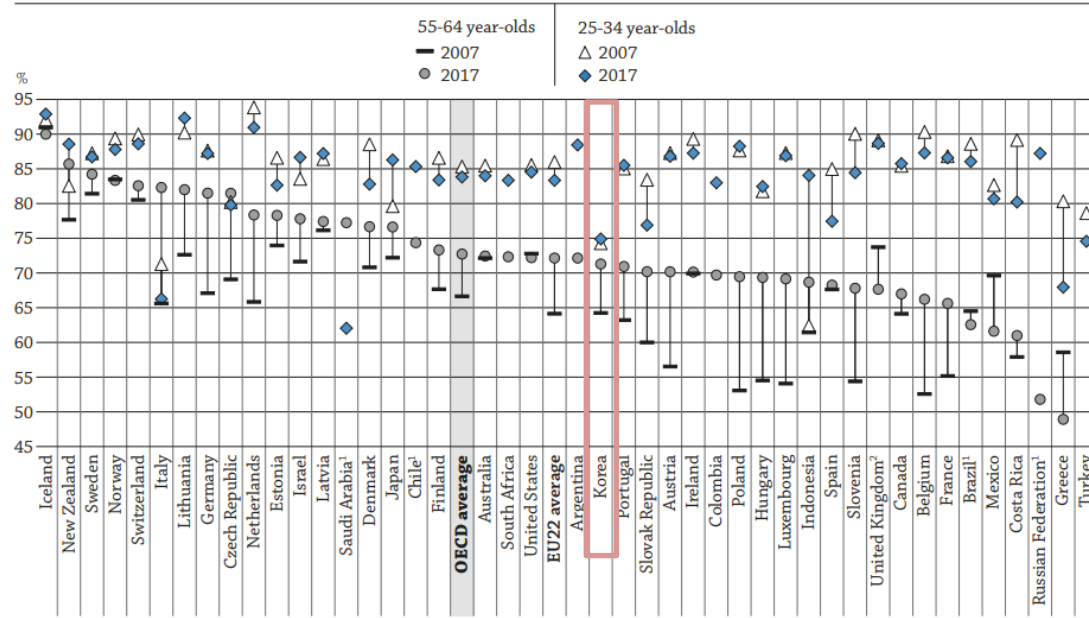# Due to the sluggish economy.....

a. High inactivity rate and low employment rate

b. Lack of diversity in career preference

c. Over-qualified employment

Despite high enrollment rate of higher education, Korean youth face low employment rate

Only 75 percent of 25-34 year-olds with tertiary education have a job. It is 10 percent lower than OECD average

Figure A3.3. **Trends in employment rates of 25-34 and 55-64 year-olds with tertiary education (2007 and 2017)**

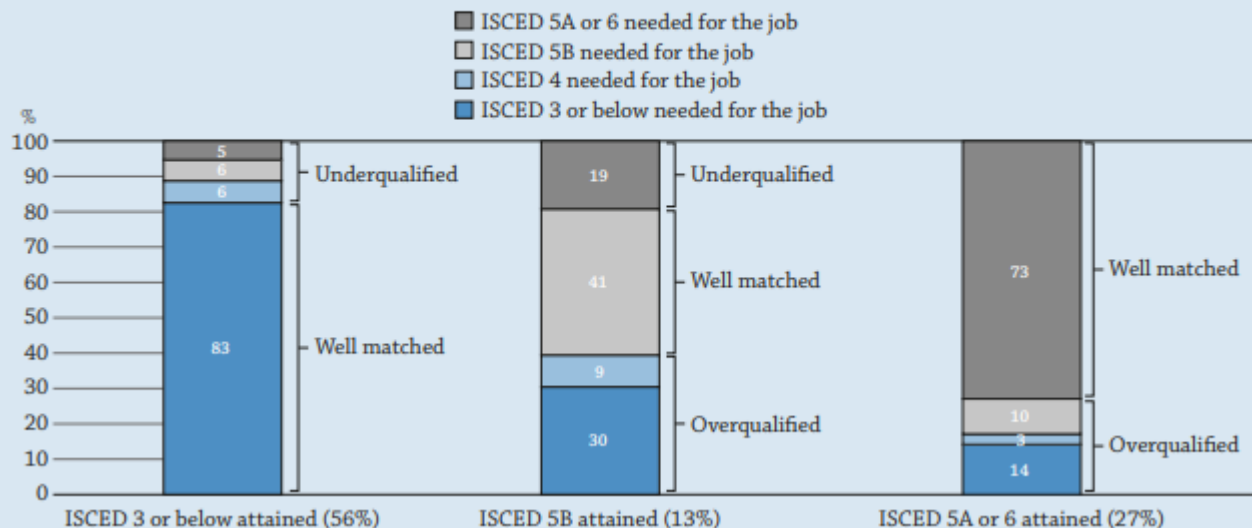# About 440,000 Koreans prepare for civil service exams

- **Economic participation rate** is dropping : as of 2018, only 48.4% Korean youths (15-29 years-olds) participated labor force

- **15.3% of economically inactive Korean youth** are now preparing "employment exam". (=626,000)

- **2 out of 3 Korean youths** who prepare employment exam are studying for national and state-run **civil service exam**

- **More than half** of the test applicants counted **"job security"** as the primary motivation for choosing civil servant as a job

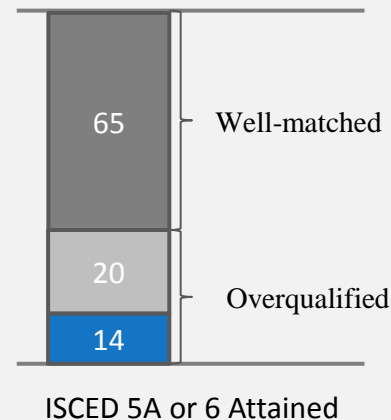# 34 percent of Korean with bachelor degree are overqualified employee

Over-qualification is index of "BAD JOBS"

Figure A3.a. **Qualification match or mismatch among workers (2012 or 2015)**
Survey of Adult Skills (PIAAC), employed 25-64 year-olds, OECD average

Legend:
- ISCED 5A or 6 needed for the job
- ISCED 5B needed for the job
- ISCED 4 needed for the job
- ISCED 3 or below needed for the job

ISCED 3 or below attained (56%)
- Underqualified: 5, 6, 6
- Well matched: 83

ISCED 5B attained (13%)
- Underqualified: 19
- Well matched: 41
- 9
- Overqualified: 30

ISCED 5A or 6 attained (27%)
- Well matched: 73
- 10
- 3
- Overqualified: 14

\<Korea\>
- Well-matched: 65
- Overqualified: 20
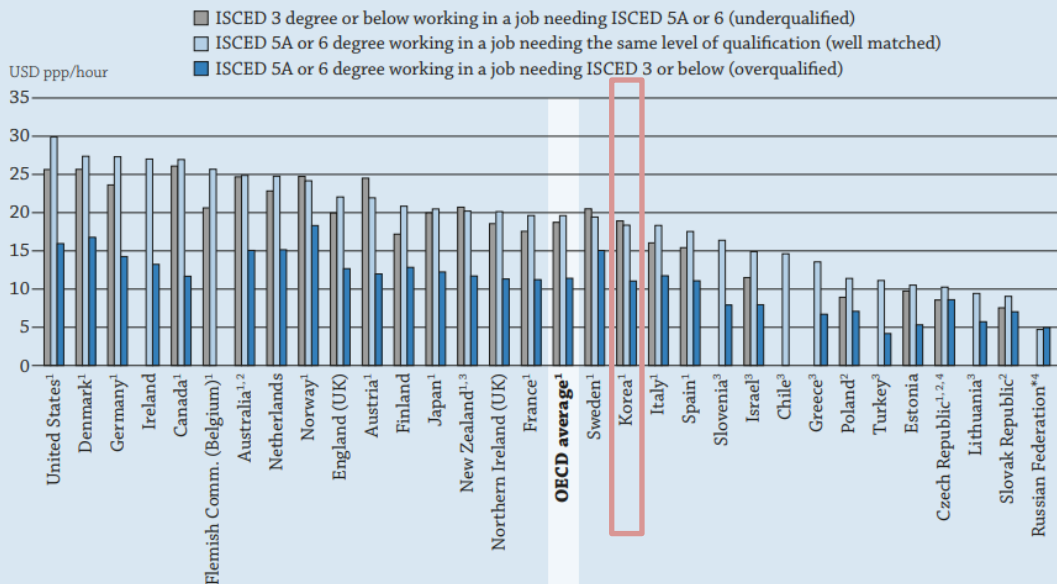- 14

ISCED 5A or 6 Attained

Relationship between over-qualification and earnings
Overqualified people earn about half as much as well-matched people do

Figure A4.a. **Median hourly earnings, by selected qualification match or mismatch among workers (2012 or 2015)**

Survey of Adult Skills (PIAAC), employed 25-64 year-olds, median hourly earnings in equivalent 2012 USD converted using PPPs for private consumption
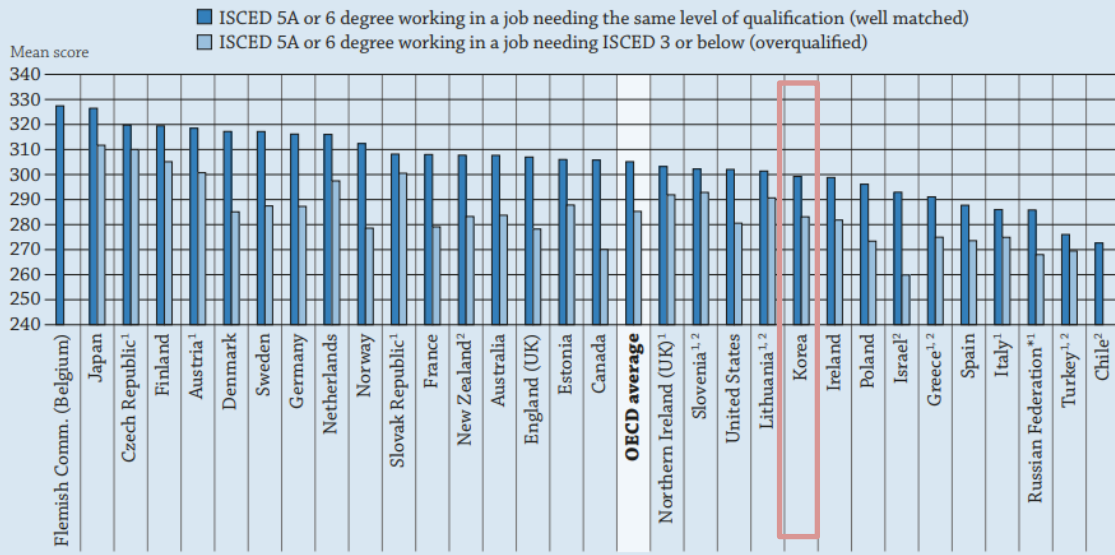
People who are overqualified are likely to have lower skills

Overqualified people may have not been able demonstrate sufficient skills to get a job at the level of their qualification

Figure A3.b. **Mean numeracy score among adults with ISCED 5A or 6, by selected qualification match or mismatch among workers (2012 or 2015)**

Survey of Adult Skills (PIAAC), employed 25-64 year-olds

Getting the RIGHT NUMER of VET students

- **Student preference :** VET is only second choice of students with low academic achievement

- **Employer needs :** some risks emerge

  Skills shortage = low wage or unpleasant job

  Industries in structural decline may face with skills

  shortage because they cannot attract workers

- **BALANCING student preference and employer needs**

Source: OECD(2010). Learning for jobs

Q2.
Young people in education make choices.
VET is optimal choice for students?

Private return to VET

- **Cognitive ability gaps and family back ground differences btw VET and GE graduates**

  - Two groups are **not HOMOGENEOUS** in terms of cognitive ability and SES

- **Labor market advantage of VET graduates**

  - In the short-term, VE has **positive effects** on a smooth school-to-work transition(e.g., Brunello, 2007; CEDEFOP, 2012, 2013a; Golsteyn & Stenberg, 2017)

  - With regard to the short-term advantage of VET, recent studies suggest that this positive effect **fades out over time**(Hanushek et al, 2017)

  - Private return to VET could be **affected by country-level VET systems**(Choi et al, 2019)
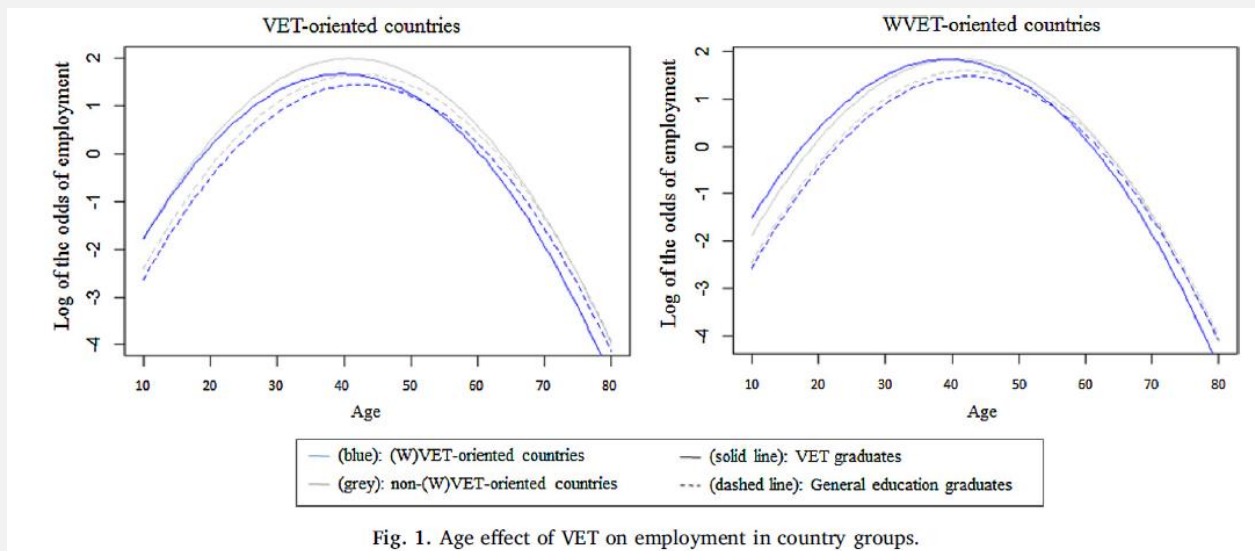
LABOR MARKET OUTCOMES:
Short-term advantage and long-term disadvantage of VET

	(1) Null model	(2) Including level 1 variables	(3) Level 1 + 2 (VET)	(4) Level 1 + 2 (WVET)	(5) Literacy scores controlled	(6) With PSM samples
Fixed effects						
Intercept	.8432***	−5.3999***	−5.3300***	−5.3764***	−5.0994**	−4.6343)***
	(.0947)	(.9842)	(.1888)	(.9831)	(1.1981)	(.8516)
VE oriented			−.2179			
			(.2178)			
Work-based VE oriented				−.1119	−.1084	−.3140
				(.2329)	(.2373)	(.2820)
VET						
Intercept		.9307***	.7614***	.7028***	.6879***	.0885
		(.1076)	(.1516)	(.1045)	(.1002)	(.1033)
VE oriented			.2948			
			(.2052)			
Work-based VE oriented				.5972**	.5766**	.3226*
				(.1485)	(.1611)	(.1480)
Age/10		3.2953***	3.3115***	3.2982***	3.2923***	3.0317***
		(.4748)	(.0655)	(.4727)	(.4680)	(.3946)
(Age/10)²		−.3897***	−.3918***	−.3902***	−.3904***	−.3632***
		(.0559)	(.0079)	(.0557)	(.0545)	(.0475)
VET*(Age/10)						
Intercept		−.1561***	−.1028**	−.1079***	−.1059***	−.0000
		(.0233)	(.0299)	(.0121)	(.0117)	(.0000)
VE oriented			−.1000*			
			(.0373)			
Work-based VE oriented				−.1249***	−.1231**	−.00003*
				(.0348)	(.0354)	(.0000)
Literacy					−.0008	
					(.0010)	
Random effects						
Intercept, U0	.0753***	.1198***	.1241***	.1306***	.1372***	.2000***
VET		.0621**	.0545	.0233	.0256	.0379***
Age10		–				
(Age/10)²		–				
VET*(Age/10)		.0044***	.0013	.0014	.0015	.0000***

"Short-term employment premium of VET **attenuate over the life-cycle**"

Source: Choi et al(2019). Impact of vocational education and training on adult skills

LABOR MARKET OUTCOMES:
Differences between GE-oriented countries and WVET-oriented countries

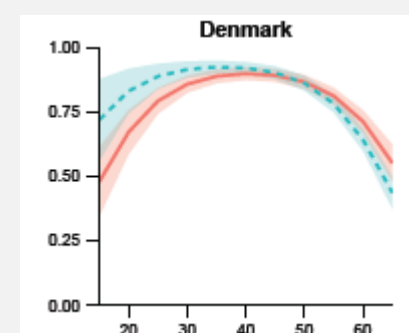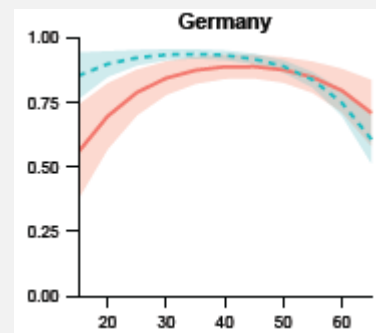Fig. 1. Age effect of VET on employment in country groups.
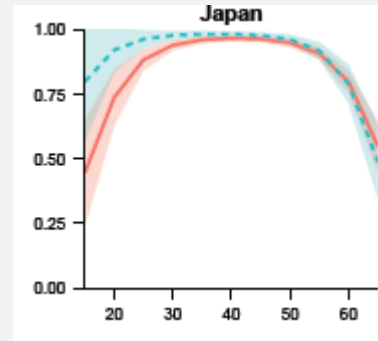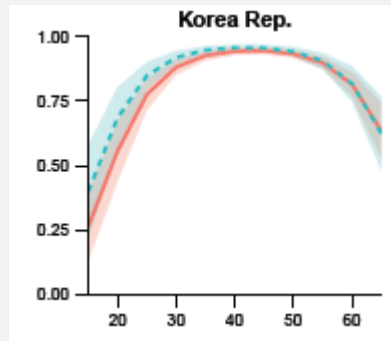
VET premium on employment diminish at a very slow level

VET graduates from WVET
countries are initially more likely to be employed, but those employment
premiums narrow faster to zero over age.

LABOR MARKET OUTCOMES:

Some GE-oriented countries also shows converging patterns(e.g., USA)

Source: Foster et al(2016). Vocational education and employment over the life cycle

Suggestions

- **Policy debates should consider converging patterns of individual returns to VET**

    - the issue is not indictment of the "vocationalization" of school policy regimes, but instead an emphasis on basic skills in VET programs

    - Basic skills including literacy and numeracy are closely related to the learning abilities needed to acquire new skills in a rapidly changing work environment

- **Consideration of the selectivity bias is crucial for evaluating returns to VET**

    - Both politicians and policymakers frequently have expectations of VET that are much greater than those they have for general education, despite the VET track often being intended for youths with lower motivation and ability.

Source: Choi et al(2019). Impact of vocational education and training on adult skills

Q3. Future of jobs and labor market will still need VET graduates?

Automation capability of current technologies

	Automation capability	Capability level[1]	Description (ability to …)
Sensory perception	Sensory perception	🟧	Autonomously infer and integrate complex external perception using sensors
Cognitive capabilities	Recognizing known patterns/categories (supervised learning)	🟩	Recognize simple/complex known patterns and categories other than sensory perception
	Generating novel patterns/categories	🟥	Create and recognize new patterns/categories (e.g., hypothesized categories)
	Logical reasoning/ problem solving	🟥	Solve problems in an organized way using contextual information and increasingly complex input variables other than optimization and planning
	Optimization and planning	🟩	Optimize and plan for objective outcomes across various constraints
	Creativity	🟥	Create diverse and novel ideas, or novel combinations of ideas
	Information retrieval	🟩	Search and retrieve information from a large scale of sources (breadth, depth, and degree of integration)
	Coordination with multiple agents	🟥	Interact with others, including humans, to coordinate group activity
	Output articulation/ presentation	🟧	Deliver outputs/visualizations across a variety of mediums other than natural language
Natural language processing	Natural language generation	🟧	Deliver messages in natural language, including nuanced human interaction and some quasi language (e.g., gestures)
	Natural language understanding	🟥	Comprehend language, including nuanced human interaction
Social and emotional capabilities	Social and emotional sensing	🟥	Identify social and emotional state
	Social and emotional reasoning	🟥	Accurately draw conclusions about social and emotional state, and determine appropriate response/action
	Social and emotional output	🟥	Produce emotionally appropriate output (e.g., speech, body language)
Physical capabilities	Fine motor skills/dexterity	🟧	Manipulate objects with dexterity and sensitivity
	Gross motor skills	🟩	Move objects with multidimensional motor skills
	Navigation	🟩	Autonomously navigate in various environments
	Mobility	🟥	Move within and across various environments and terrain

Legend: 🟥 Below median 🟧 Median 🟩 Top quartile

LABOR MARKET POLARIZATION

- Growing employment in high-income cognitive jobs and low-income manual occupations
- hollowing-out of middle-income routine jobs

Automation risks of middle-income routine jobs

48 % employment is in the high risk

- Low-skilled white collar jobs
  - Office and admin. Support
  - Sales and related
  - Services
- Middle skilled blue collar jobs
  - Production
  - Construction
  - Transportation and material moving

Source: Frey & Osborne(2013). The future of employment: how susceptible are jobs to computerisation?

Employer Want Both Cognitive and Complex Problem Skills

Scale of Skills Demand in 2020	
Cognitive Abilities	**15%**
Systems Skills	17%
Complex Problem Solving	**36%**
Content Skills	**10%**
Process Skills	18%
Social Skills	19%
Resource Management Skills	**13%**
Technical Skills	12%
Physical Abilities	4%

Source: Future of Jobs Survey, World Economic Forum.

Percent of all Job Ads Requiring Skill	
Cognitive	**37%**
Social	36%
Cognitive and social	25%

Source: Deming and Kahn (2017)

Summary

Vocational education can solve oversupply of graduates

People who choose vocational track has employment premium,
but this positive effect fades out over time

SBTC and industries 4.0 predict VET graduates is in the high risk of automation

Solutions

- **Identify "GENUINE SKILL MISMATCH"**

- **Engage Lifelong Learning in SME**

- **Restructuring VET curriculum – avoid routine task jobs and narrow skill based jobs**

- **Strong government driven initiatives to increase VET attractiveness**

Source: Choi et al(2019). Impact of vocational education and training on adult skills

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