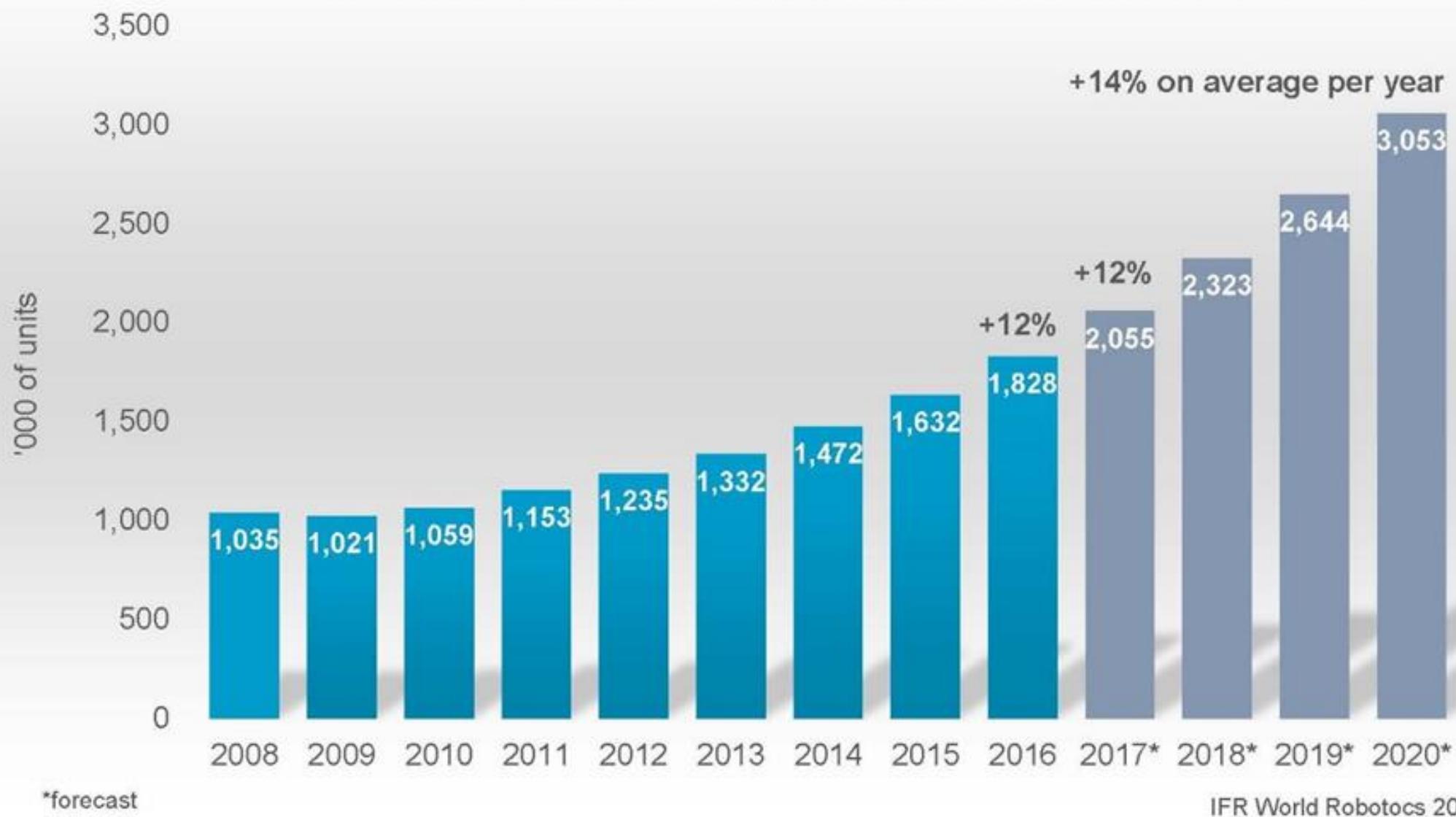


FUTURO DEL TRABAJO

¿CÓMO IMPACTA Y QUE HACER EN AMERICA LATINA?

- ESTIMACION DE IMPACTO EN EMPLEO
- POSIBLES CONSECUENCIAS EN LA ECONOMÍA Y LA SOCIEDAD
- ALGUNAS POLITICAS Y ACCIONES ANTICIPATORIAS.

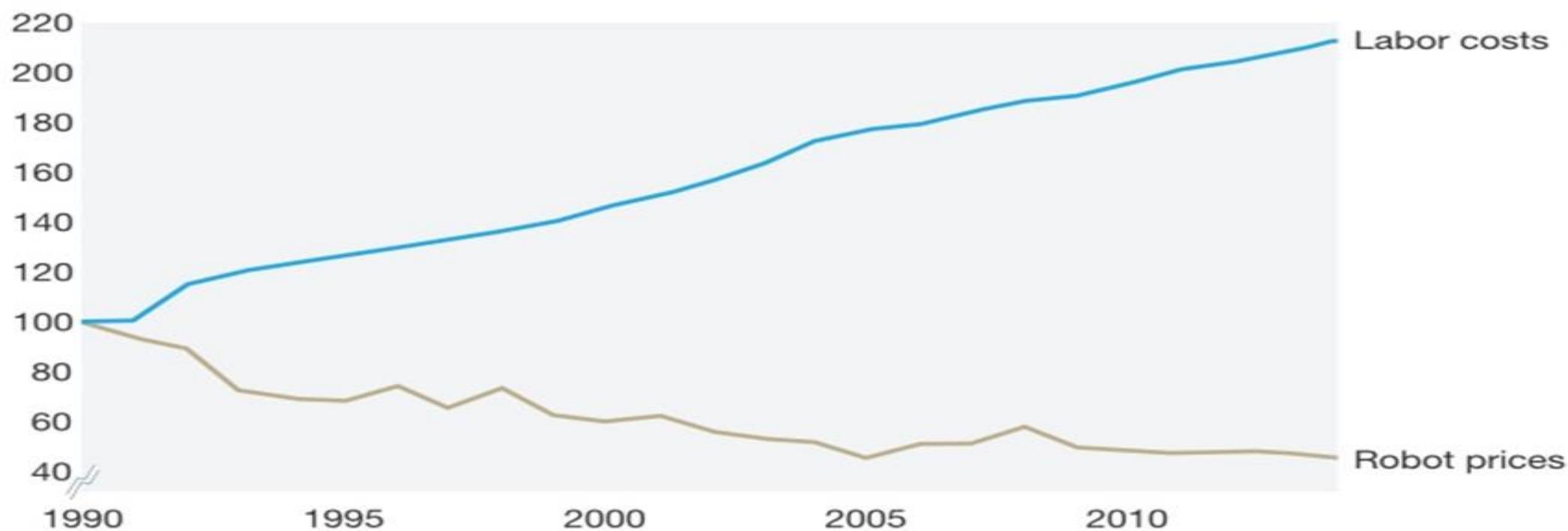
Estimated worldwide operational stock of industrial robots 2015-2016 and forecast for 2017*-2020*



Robot prices have fallen in comparison with labor costs.

Cost of automation

Index of average robot prices and labor compensation in manufacturing in United States,
1990 = 100%



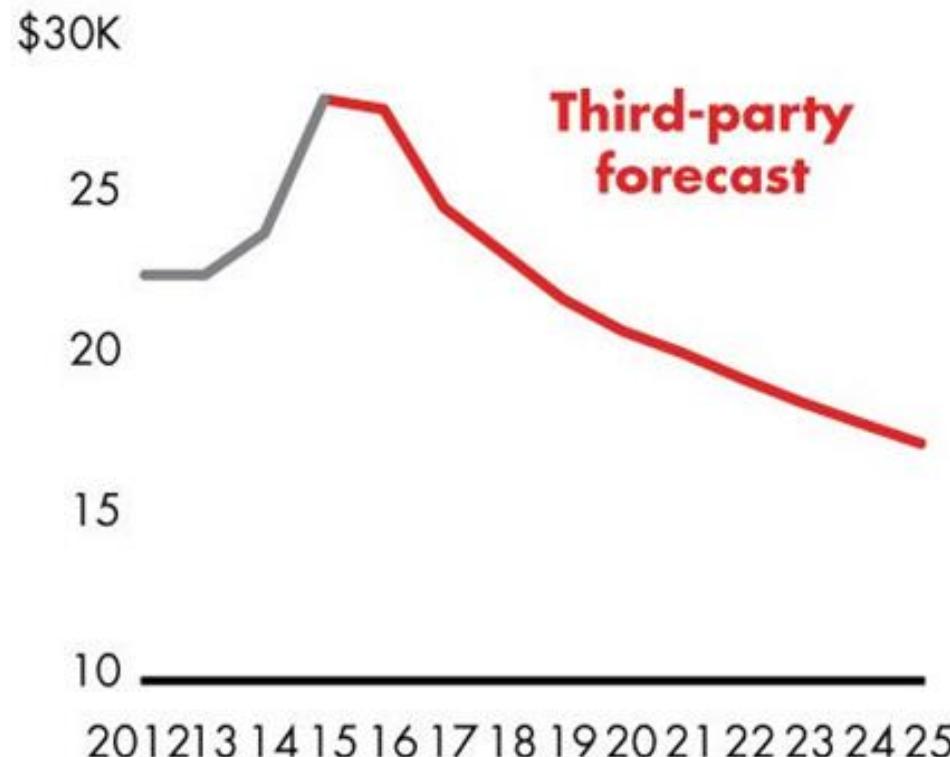
Source: Economist Intelligence Unit; IMB; Institut für Arbeitsmarkt- und Berufsforschung;
International Robot Federation; US Social Security data; McKinsey analysis

Figure 21

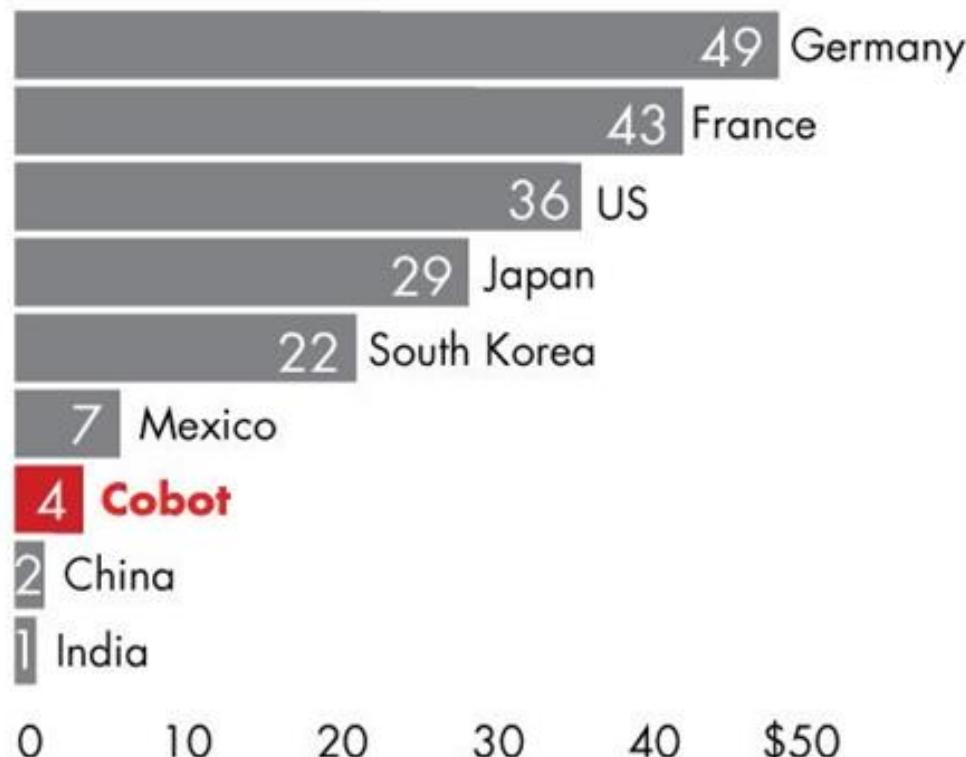
shared by Anthony Schmitt , @BourseetTrading

Next-generation robots are becoming cost competitive against developing-economy workers

Average selling price of a cobot
(collaborative robot)



Average hourly cost of manufacturing workers by country vs. cobot, 2013



Notes: Hourly cost of cobots calculated using 6,300-hour warranty life that comes with the Baxter cobot; China and India data from 2012 and 2011, respectively
Sources: Barclays Equity Research; Conference Board; Robotworx; Rethink Robotics; Bain Macro Trends Group analysis, 2017

ALGUNOS ESTUDIOS RECENTES I

- *The Future of Employment: How susceptible are jobs to computerisation?*
Carl Benedikt Frey and Michael A. Osborne, September, 2013)
- *A Future that Works: Automation, employment and Productivity,*
McKinsey, Enero 2017)
- *Workforce of the future. The competing forces shaping 2030*, PwC, 2017.
- *The Future of White-Collar Work: Sharing Your Cubicle With Robots.*
Forrester (2017)
- *Forecasts for the Human Progress and Human Services 2035 Scenarios*
Clem Betzold , Institute for Alternative Futures, 20184.
- *Trends Shaping Education, Spotlight 15*, OCDE, 2018

ALGUNOS ESTUDIOS RECIENTES II

- *Automation, skills and training*; Nedelkoska et al, OECD, 2018.
- *The Future of Work Report, 2018*. World Economic Forum
- *El Futuro del Trabajo. Perspectivas regionales*, BID, ADB, otros, Abril 2018.
- *Futuro del empleo, Chile*. Exposicion de Hernan Araneda, Fundacion Chile , 2018
- *Labor 2030: The Collision of Demographics Automation and Inequality*, Karen Harris et al, Bain and Co. Febr 2018
- *The Future of Work*, Darrell West, Brookings Institution, 2017

PROPORCION DE TRABAJOS CON RIESGO DE AUTOMATIZACION

Table 3.1 – Estimated share of jobs at potential high risk of automation across countries for each of the three waves: Algorithm wave, Augmentation wave and Autonomy wave

Country	Algorithm wave (%)	Augmentation wave (%)	Autonomy wave (%)
Slovakia	4	25	44
Slovenia	3	24	42
Lithuania	4	26	42
Czech Republic	3	25	40
Italy	4	23	39
USA	5	26	38
France	4	22	37
Germany	3	23	37
Austria	3	22	34
Spain	3	21	34
Poland	2	18	33
Turkey	1	14	33
Ireland	2	19	31
Netherlands	4	21	31
UK	2	20	30
Cyprus	2	19	30
Belgium	4	18	30
Denmark	3	19	30
Israel	3	19	29
Chile	1	13	27
Singapore	4	18	26
Norway	3	18	25
Sweden	3	17	25
New Zealand	2	16	24
Japan	4	16	24
Russia	2	12	23
Greece	2	13	23
Finland	2	16	22
South Korea	2	12	22

Note: figures shown are cumulative so those in the final column include the estimated impacts from all three waves of automation.

Source: PIAAC data, PwC analysis

AUTOMATIBILIDAD EL TRABAJO , POR PAIS

Table 4.5. Cross-country variation in job automatability

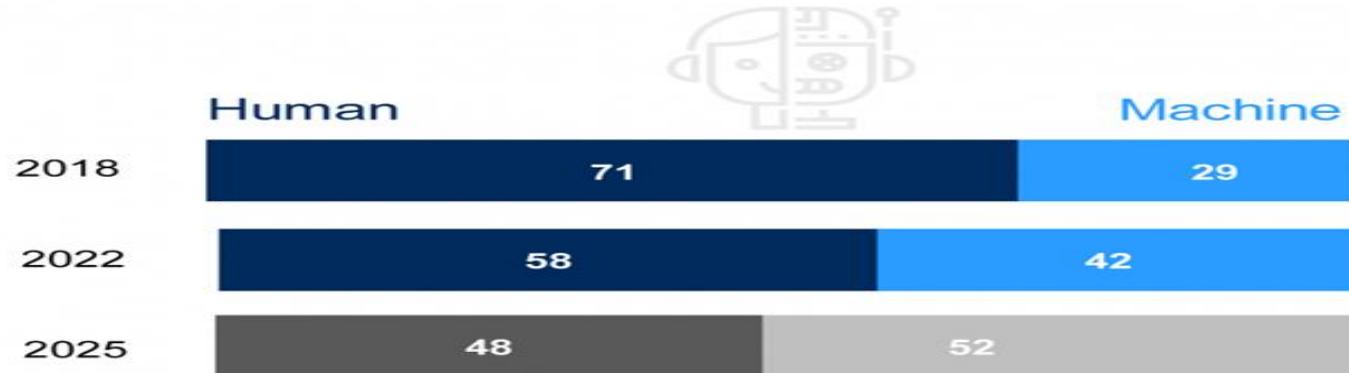
Country	Median	Mean	S.D.
New Zealand	0.39	0.42	0.20
Norway	0.40	0.41	0.18
Finland	0.41	0.43	0.18
United States	0.41	0.43	0.20
Northern Ireland (UK)	0.42	0.43	0.21
England (UK)	0.42	0.43	0.20
Sweden	0.43	0.44	0.19
Netherlands	0.44	0.45	0.19
Denmark	0.44	0.45	0.19
Canada	0.45	0.45	0.21
Ireland	0.45	0.46	0.22
Singapore	0.45	0.46	0.20
Belgium	0.46	0.46	0.20
Israel	0.46	0.47	0.21
Estonia	0.47	0.46	0.19
Korea	0.47	0.46	0.19
Austria	0.49	0.48	0.20
Russian Federation	0.49	0.47	0.19
Czech Republic	0.49	0.48	0.20
France	0.51	0.49	0.20
Italy	0.52	0.49	0.20
Cyprus	0.52	0.51	0.21
Poland	0.52	0.50	0.21
Japan	0.53	0.51	0.18
Slovenia	0.53	0.51	0.21
Spain	0.54	0.51	0.21
Germany	0.54	0.52	0.18
Chile	0.55	0.52	0.20
Turkey	0.55	0.52	0.18
Greece	0.57	0.54	0.19
Lithuania	0.57	0.54	0.19
Slovak Republic	0.62	0.57	0.20
All countries	0.48	0.47	0.20

Note: all observations are weighted using the final survey weights; for the median and mean columns, the colours in each row draw a heat map, with green corresponding to lowest risk and red to highest risk; standard deviations values are shown along a bar chart, with higher bars corresponding to higher standard deviations
Source: Survey of Adult Skills (PIAAC) 2012, 2015.

DISTRIBUCION DEL TRABAJO ENTRE HUMANOS Y MAQUINAS



Rate of automation
Division of labour as share of hours spent (%)



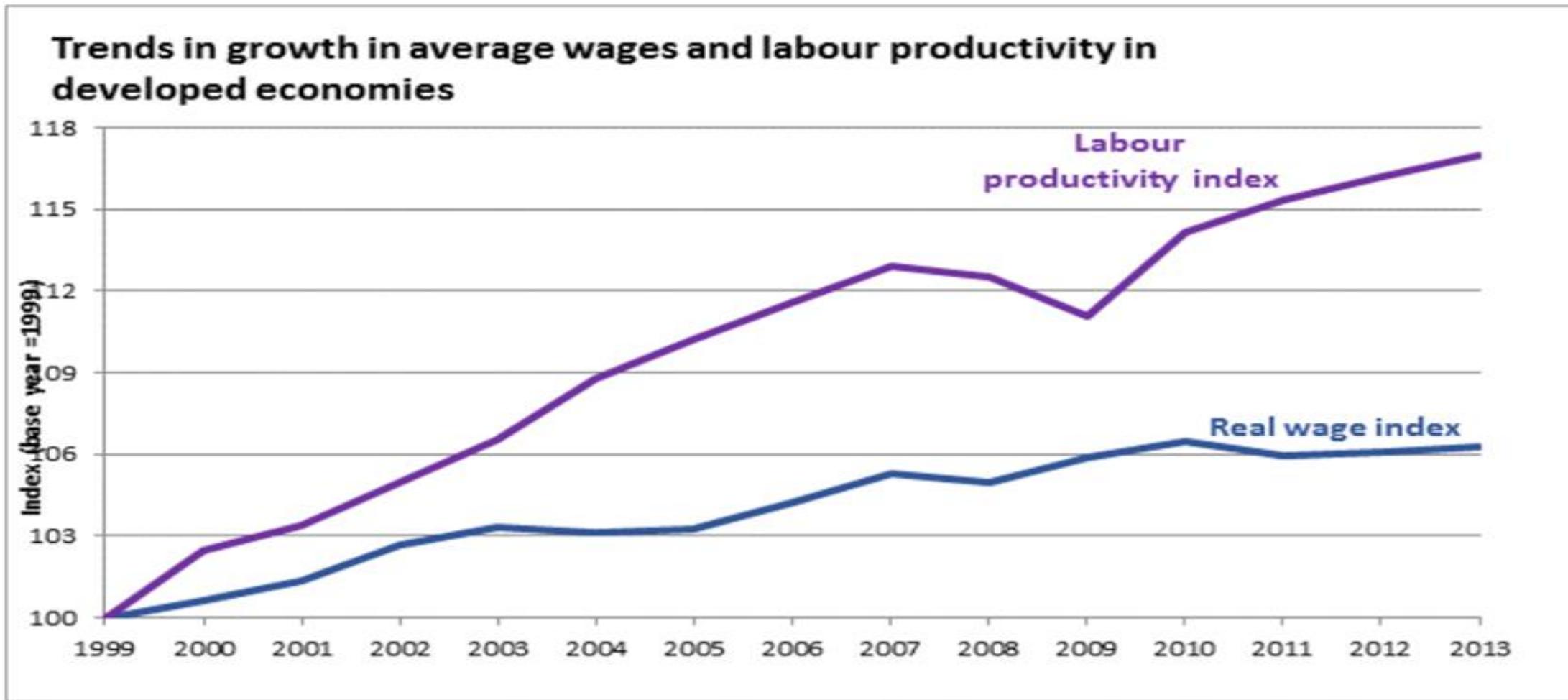
Source: Future of Jobs Report 2018, World Economic Forum

ALGUNAS CONCLUSIONES PRELIMINARES

- **DISPERSION ESTIMACIONES** (World development Report 2018 , World Bank 2019)
- **DESIGUALDAD CRECIENTE** (A Korinez, J Stiglitz “Artificial Intelligence Implications for Income Distribution and Employment”, NBER, Dec 2017)
- **JOVENES OPTIMISTAS** (“El futuro del trabajo que queremos. La voz de los jóvenes y diferentes miradas desde América latina y el Caribe” OIT américa, informes técnicos 2017 / 7)
- **BRECHA MUJERES. REZAGO** (Trends Shaping education, Trends Shaping education, OCDE, Trends Shaping education, Spotlight 15 OCDE)
- **ESCENARIOS ALTERNATIVOS. IMPACTOS POLITICOS Y SOCIALES** (Future Work/Technology 2050 Global Scenarios, Millennium Project, julio 2018)

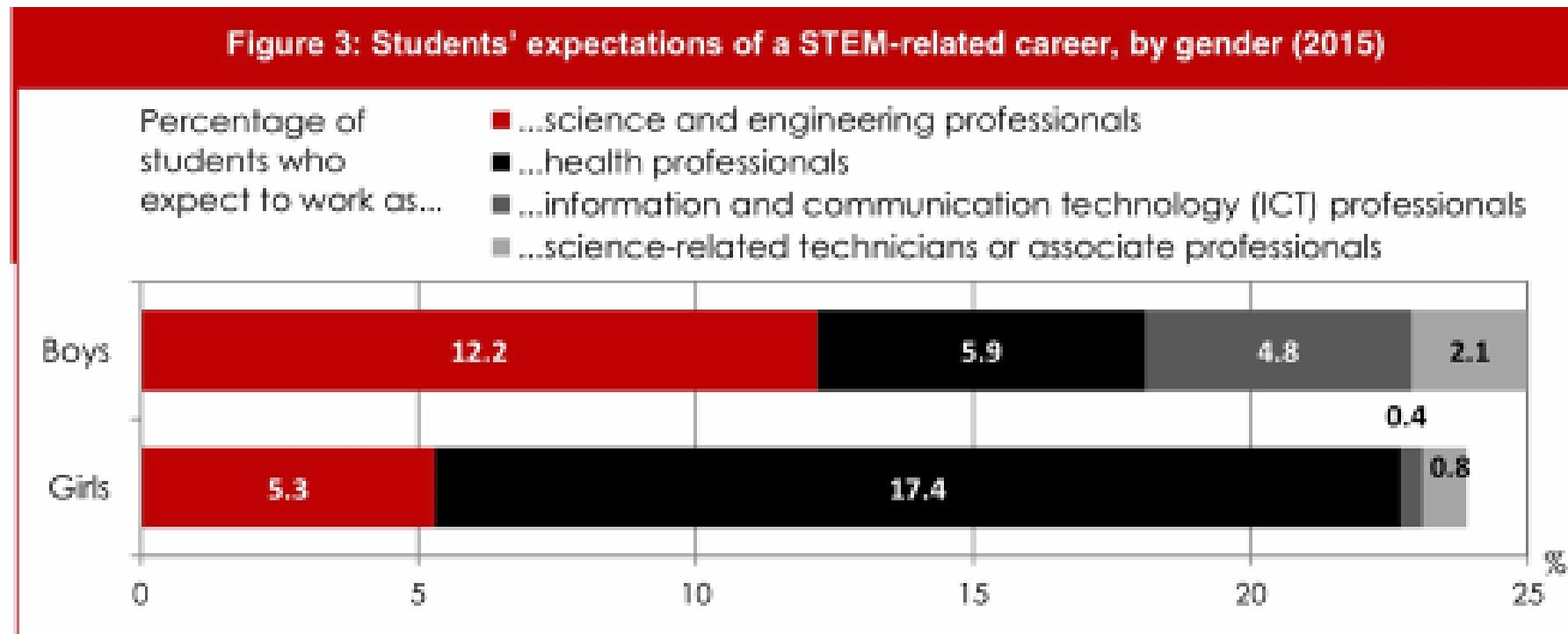
BRECHA SALARIOS PRODUCTIVIDAD LABORAL

A Korinez, J Stiglitz "Artificial Intelligence Implications for Income Distribution and Employment"
(NBER, Dec 2017)



Trabajo de Mujeres.

Expectativas de estudios STEM por genero



Source: Figure I.3.5 in OECD (2016), PISA 2015 Results (Volume I): Excellence and Equity in Education, <http://dx.doi.org/10.1787/9789264266490-en>.

DEBIL PRESENCIA MUJERES EN DIRECCION EMPRESAS

**Where are the women in
industry leadership?**

CEO



senior



middle



junior



Source: Future of Jobs Report, World Economic Forum

ALGUNAS POLITICAS ANTICIATORIAS PROGRAMA DE ACCION INTEGRAL

- SALTO EN EDUCACION NUEVOS CONTENIDOS Y HABILIDADES
- APROVECHAR OPORTUNIDAD CAMBIO DE ESTRUCTURA PRODUCTIVA
- AMPLIAR INFRAESTRUCTURA DIGITAL
- CONTENER DESIGUALDAD , NUEVO SISTEMA PROTECCION PARA LA COHESION SOCIAL
- ESTADO MAS ACTIVO PARA ENCARAR LA DISRUIPCION
- GOBERNABILIDAD COMPLEJA. IMPACTOS POLITICOS , GEOPOLITICOS, LEGALES Y ETICOS

NUEVAS HABILIDADES PARA NUEVOS TRABAJOS

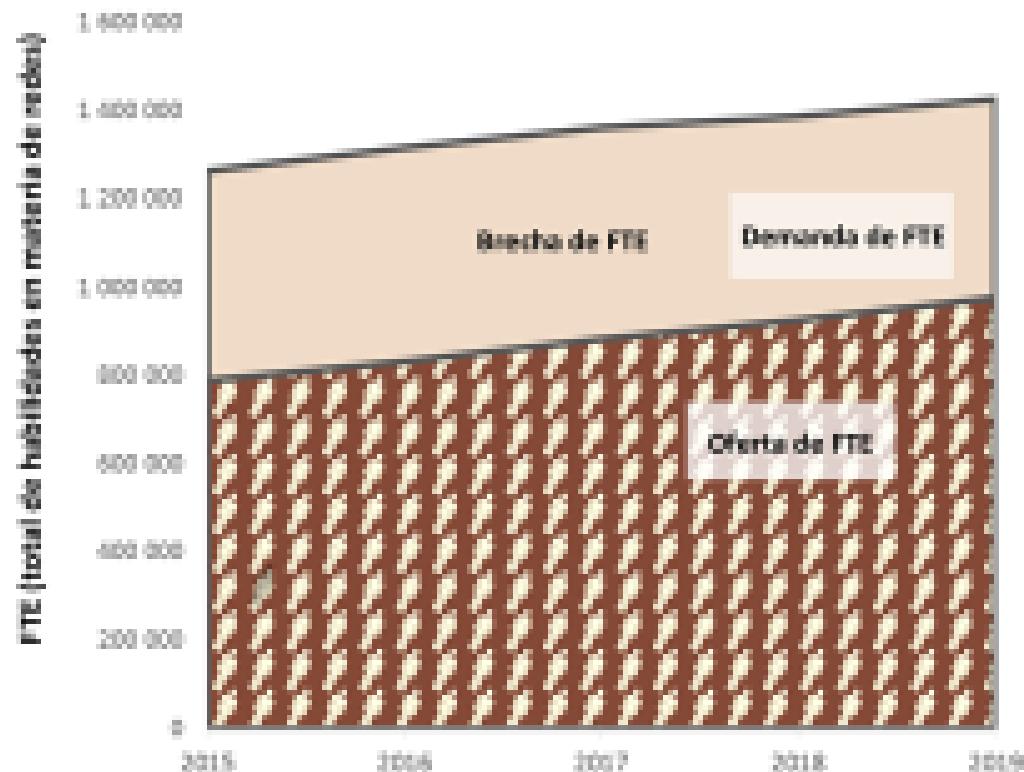
(2019 World Development Report: The changing nature of work, World Bank, sept 2018)

- Problem solving
 - Critical thinking
 - Technological knowhow
- Collaboration
Perseverance
Empathy.

- Advanced cognitive skills such as complex problem solving
- Socio behavioral skills such as teamwork
- Skill combinations that are predictive of adaptability such as reasoning and self-efficacy.

Brecha de habilidades total en materia de red - 32% para el año 2019

La falta de profesionales capacitados sigue siendo un impedimento en la adopción completa de tecnologías por parte de las empresas y los gobiernos.



Fuente: IDC, 2016

- Existe un déficit grande de 474 400 profesionales en redes en América Latina respecto a la demanda total para 2015
- La brecha tiende a disminuir levemente en un 1,4% anualmente
- Sin embargo, el déficit será del 32% para el año 2019, 449 000 FTE

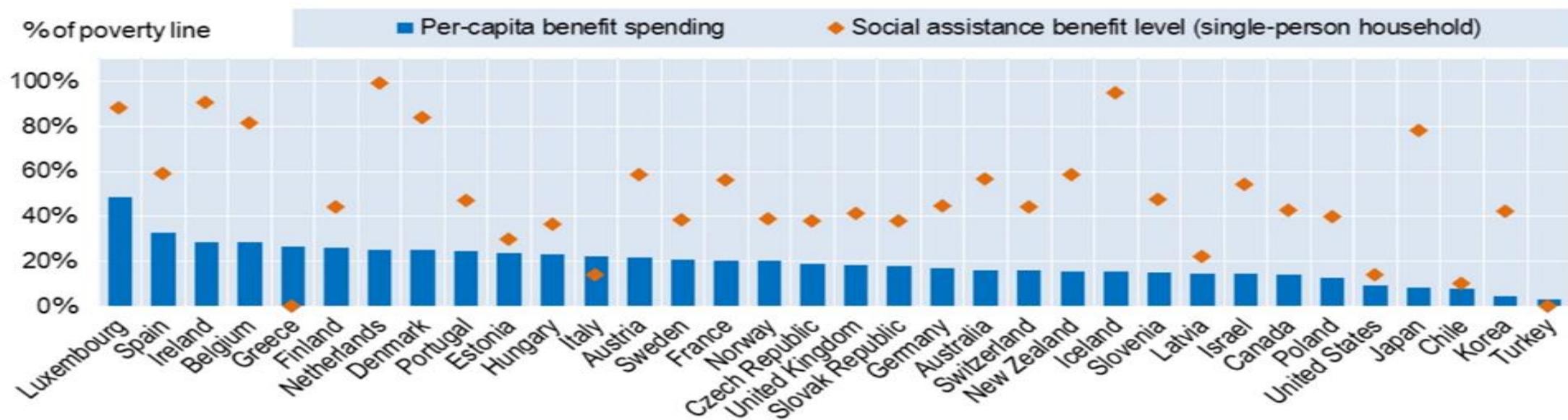
VELOCIDAD BAJADA BANDA ANCHA (MBPS) MÓVIL (Speedtest Global Index August 2018) FIJA

• Promedio	23	• Promedio	48
• 1 Noruega	63	• 1 Singapur	189
• 5 Singapur	53	• 5 Corea sur	103
• 62 Peru	22	• 31 Chile	52
• 63 Ecuador	21	• 41 Trinidad y Tobago	41
• 67 Mexico	20	• 48 Uruguay	36
• 71 Brasil	19,7	• 50 Panamá	34
• 79 Bolivia	17,3	• 60 Brasil	25
• 80 Chile	17,2	• 68 Mexico	22
• 81 Trinidad y T	17,1	• 73 Argentina	21

INGRESO BASICO UNIVERSAL ¿FUNCIONA?

Figure 2. At current spending levels, a basic income would be well below the poverty line

Non-elderly benefit spending per capita and guaranteed minimum income (GMI) level as a percentage of the poverty line, 2013



Note: Poverty thresholds are 50% of median disposable household income. Per-capita spending is in gross terms and refers to total cash transfer except old-age and survivor pensions, but including early-retirement benefits where these can be identified, divided by the number of residents aged below 65 (62 in France). Where receipt of old-age pensions among working-age individuals is relatively common (e.g. in France), true per-capita amounts of all "non-elderly" benefits is significantly higher. Some countries (e.g. Luxembourg) pay significant amounts of benefits to non-residents; dividing total expenditure by the resident populations only overestimates true per-capita amounts in these cases. Social assistance amounts refer to the main means-tested safety-net benefit available for working-age people and do not include cash housing benefits that may be available separately. No nationally applicable general GMI entitlements existed in Greece and Turkey. Social Assistance in Italy refers to the *Sostegno per l'inclusione attiva* GMI programme that started being rolled out nationally in 2016; no nationally applicable GMI programme existed prior to that.

Source: OECD [Social Expenditure](#), [Income Distribution](#), and [Tax-Benefit Policy](#) database.

FUTURO DEL TRABAJO ASPECTOS POLÍTICOS E INSTITUCIONALES

- ESPACIOS DE DIALOGO: TRABAJADORES, EMPRESAS, EXPERTOS SOCIEDAD CIVIL
- CAMBIOS INSTITUCIONALES. COORDINACION “ WHOLE GOVERNMENT ”. COMISION DISRUPCION
- PLAN EDUCACION y CAPACITACION Y PROGRAMA DE PROTECCION EN TRANSICION. NUEVO PACTO SOCIAL.
- GOBERNABILIDAD DEMOCRATICA PARA INNOVACION TECNOLOGICA, COHESION SOCIAL Y PARTICIPACION POLITICA.
- VALORES GUIA: LA TECNOLOGIA PARA EL BIENESTAR GENERAL