

Contexto social da Engenharia: uma escolha de tópicos

Paulo M. S. T. de Castro

Universidade do Porto
Faculdade de Engenharia
Rua Dr Roberto Frias
4200-465 Porto, Portugal

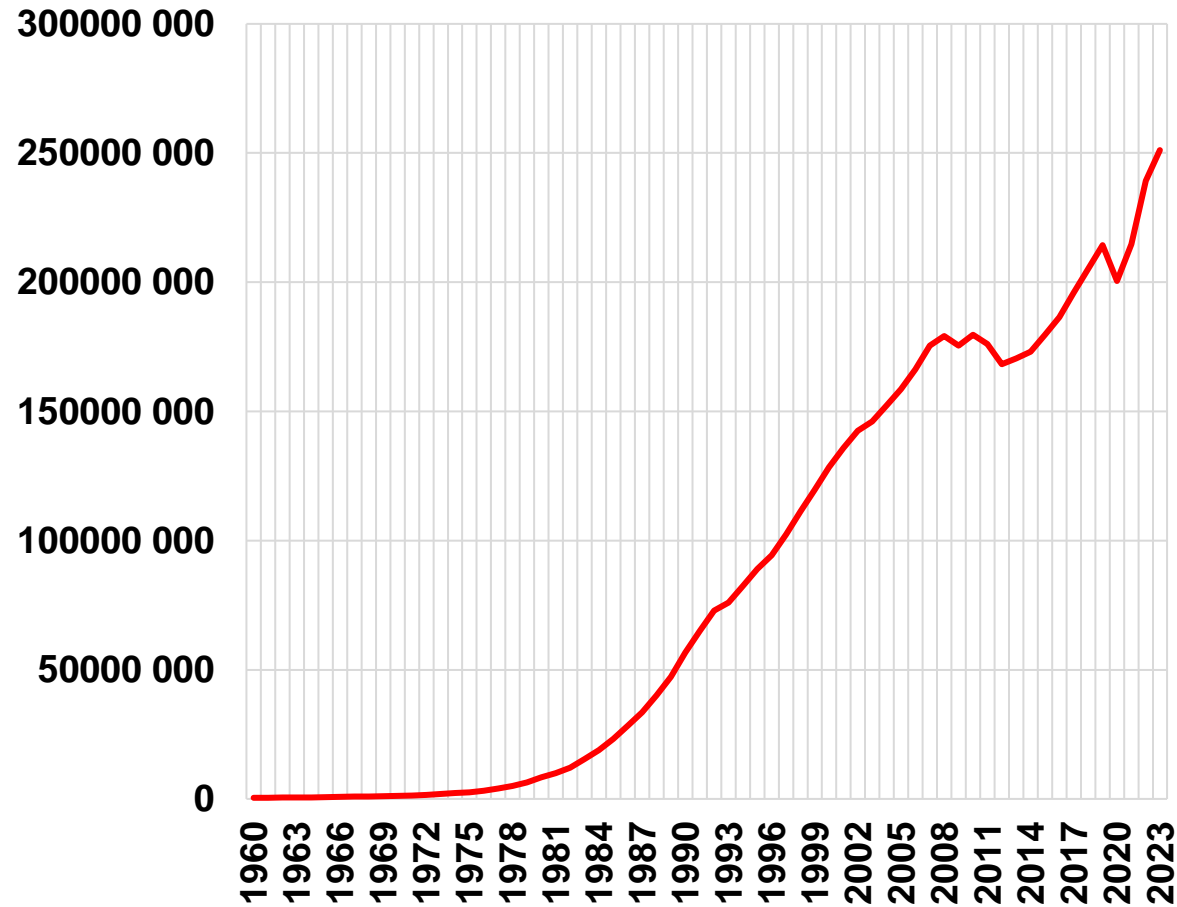
Outline

- **Portugal. Economy**
- **Education**
- **Innovation**
- **Skills**
- **R&D**
- **Final remarks**

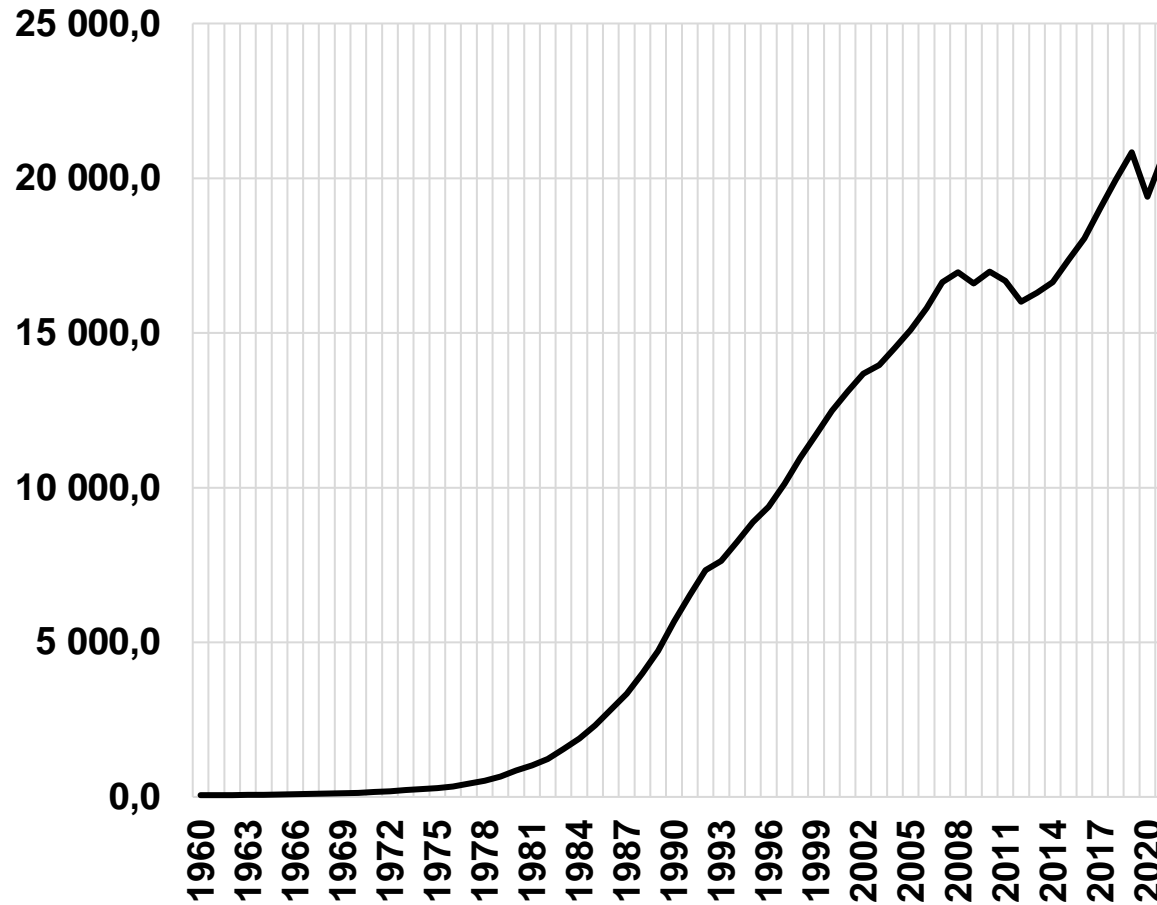
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Portugal. Gross domestic product (GDP). thousand Euro. Pordata

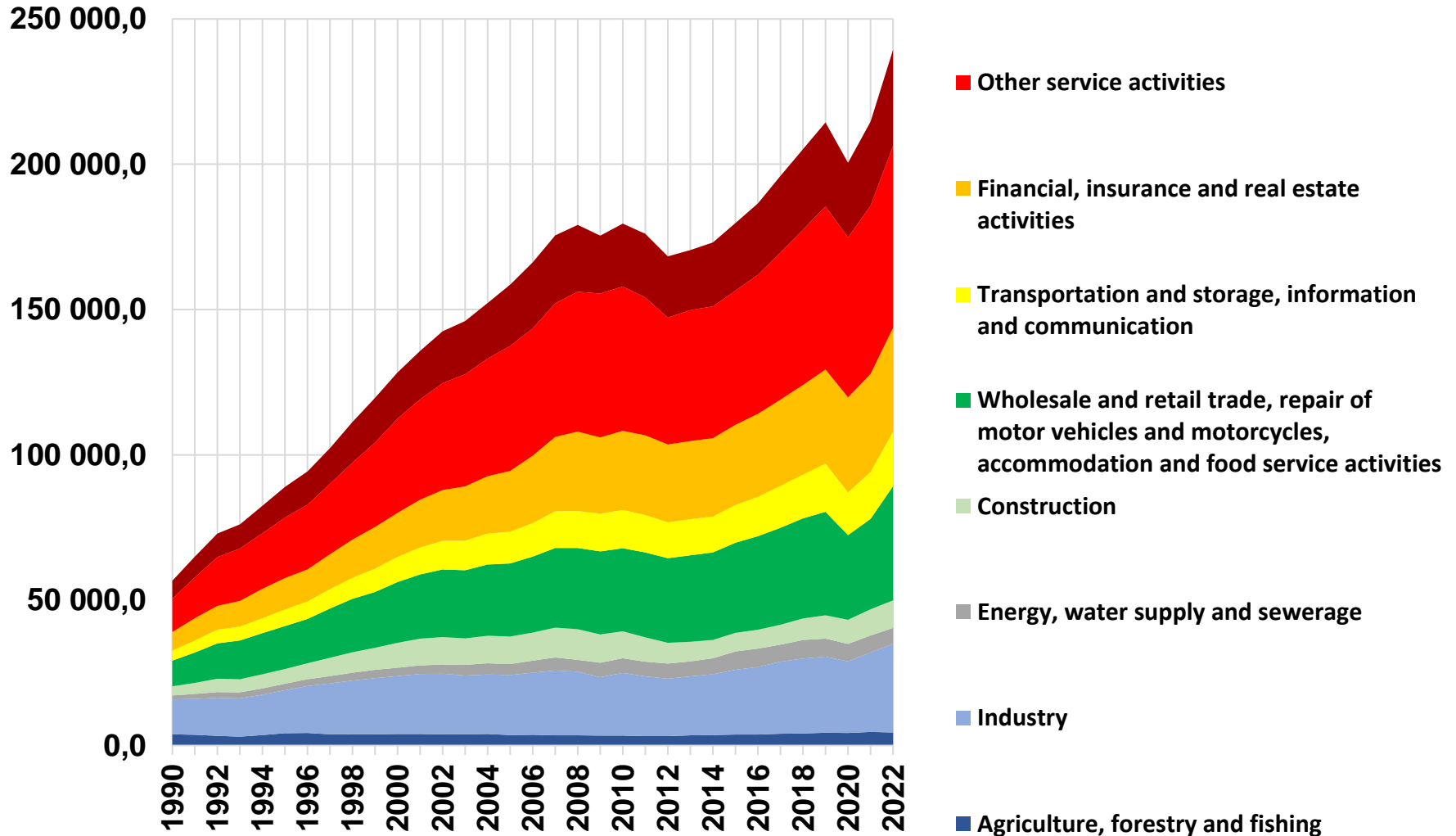


Portugal. GDP per capita. Euro. Pordata

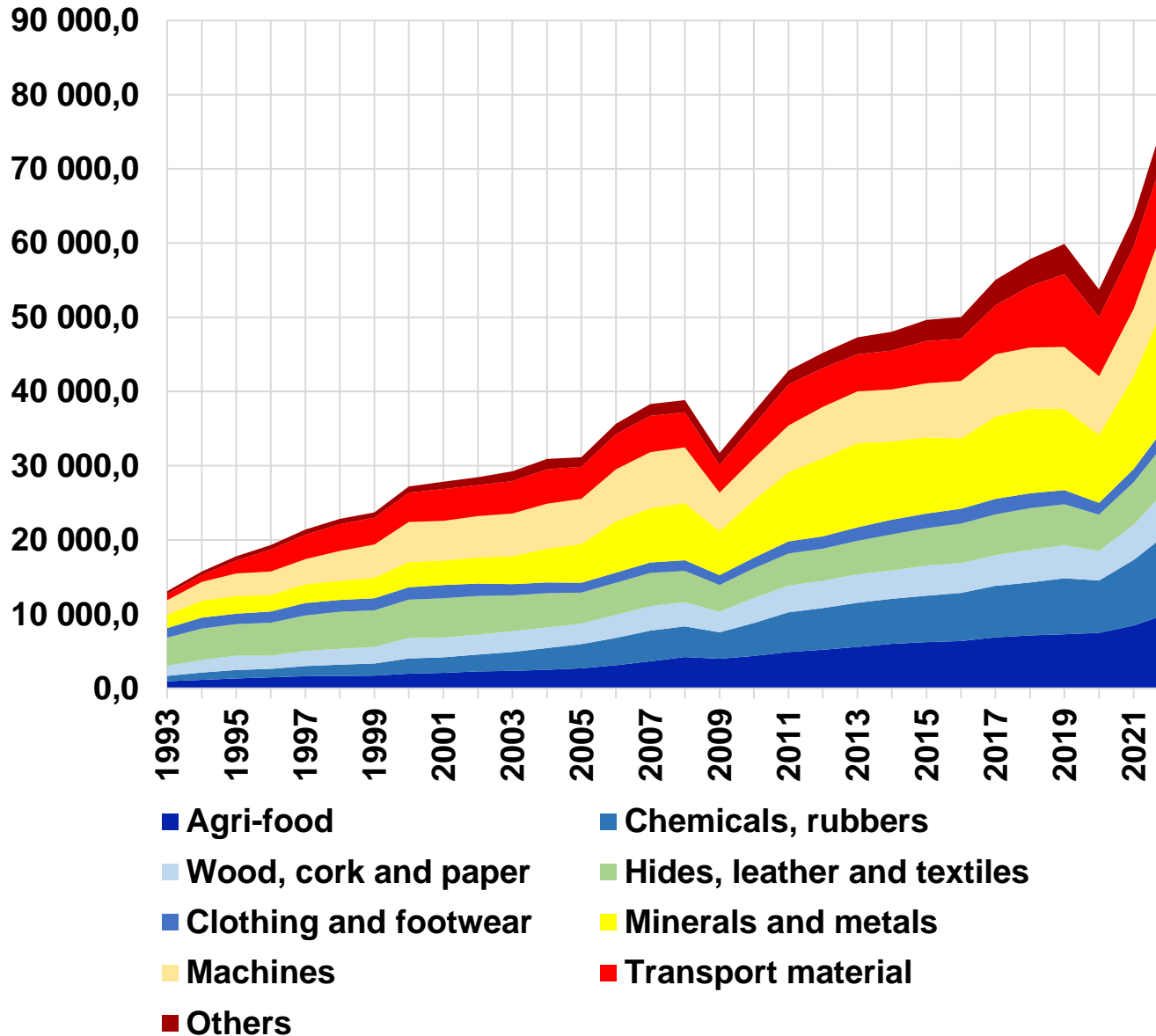


Portugal. GDP in terms of production. Million Euro.

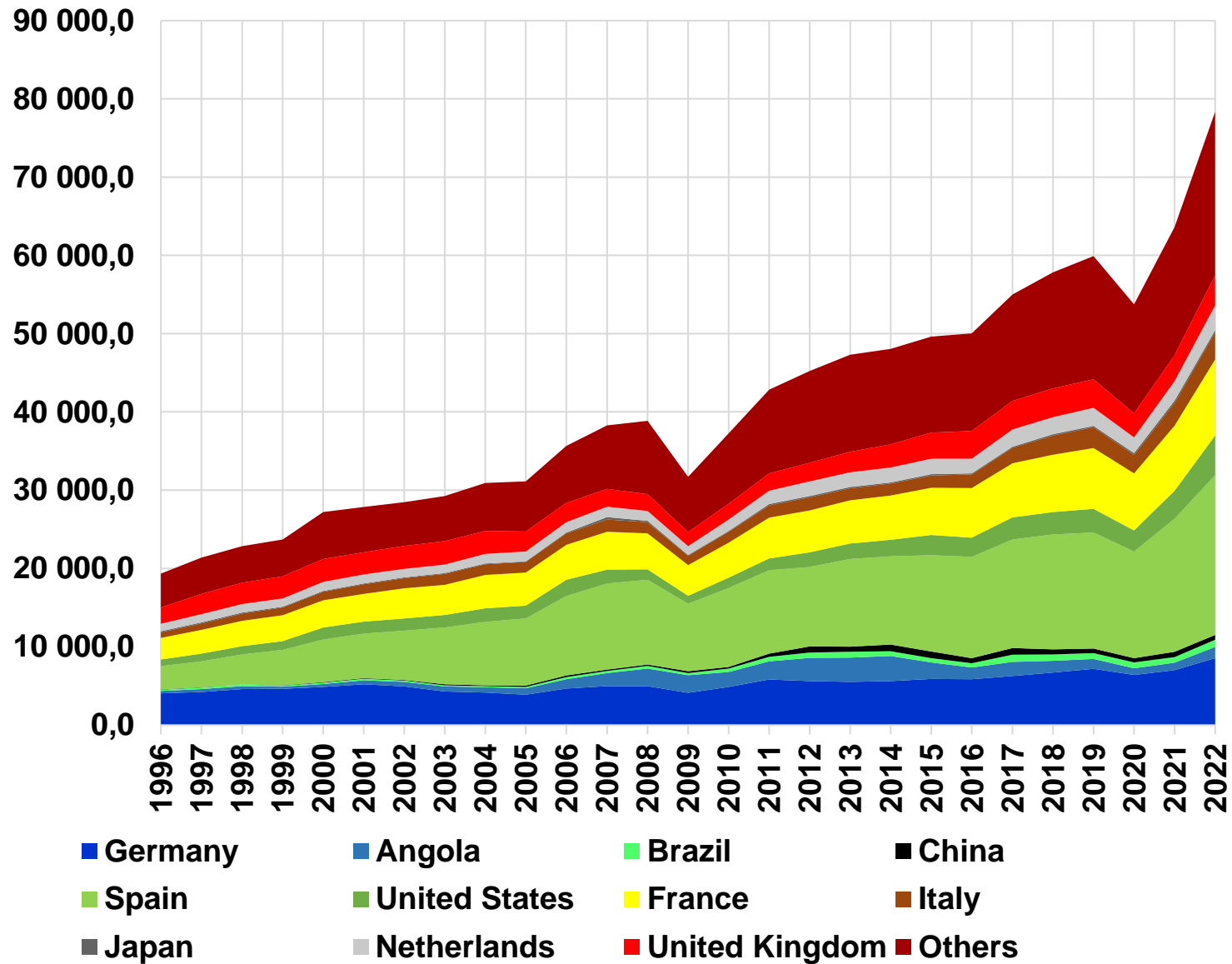
Pordata



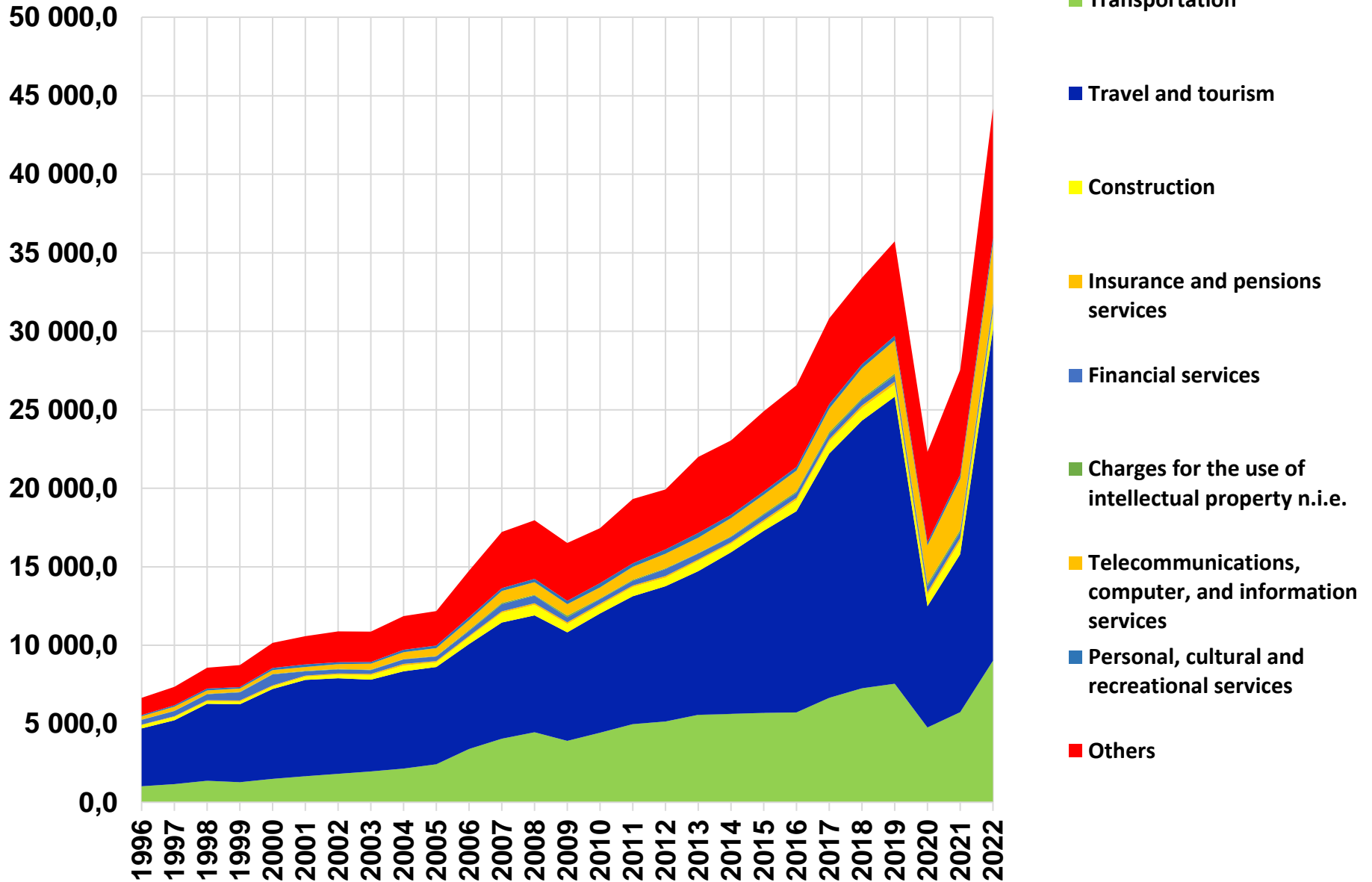
Portugal. Exports of goods by type. Million Euro. Pordata



Portugal. Exports of goods by main trading partner countries, Million Euro. Pordata

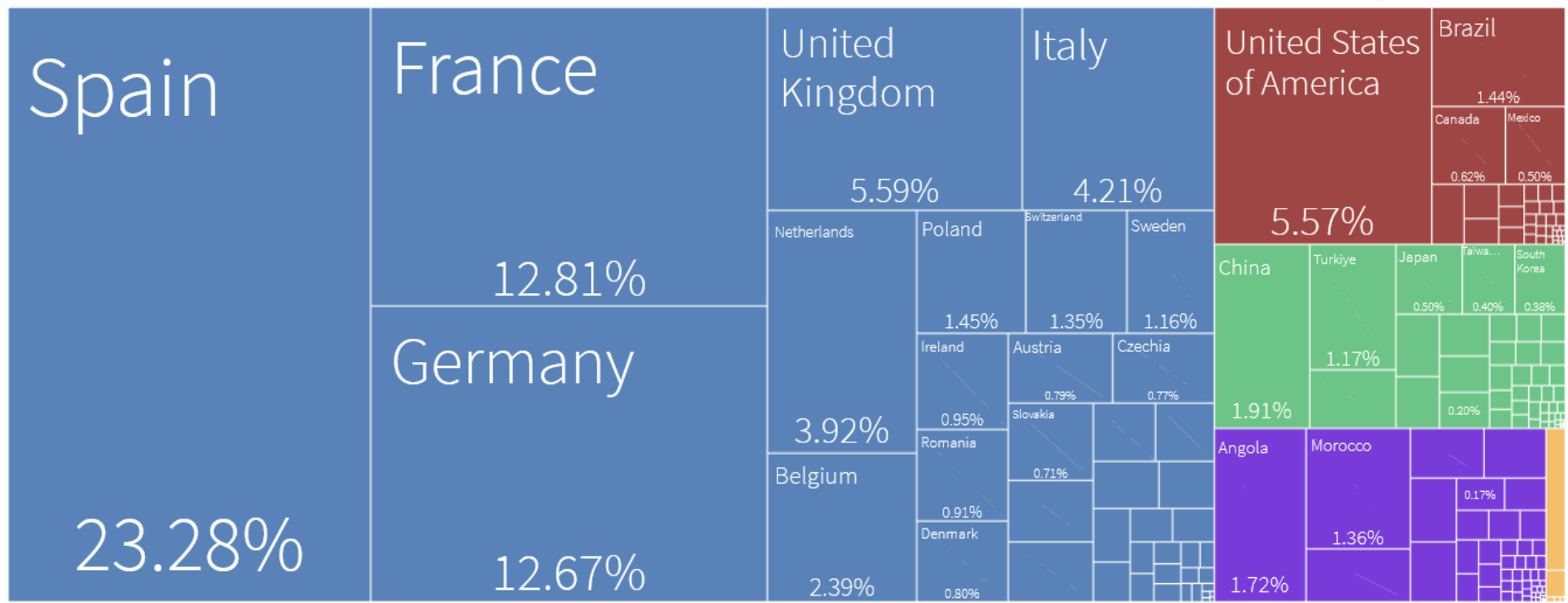


Portugal. Exports of services by type. Million Euro. Pordata



EXPORTER Portugal IMPORTER All countries PRODUCT All products YEAR 2020

Shown: \$57.8B | Total: \$58.5B i



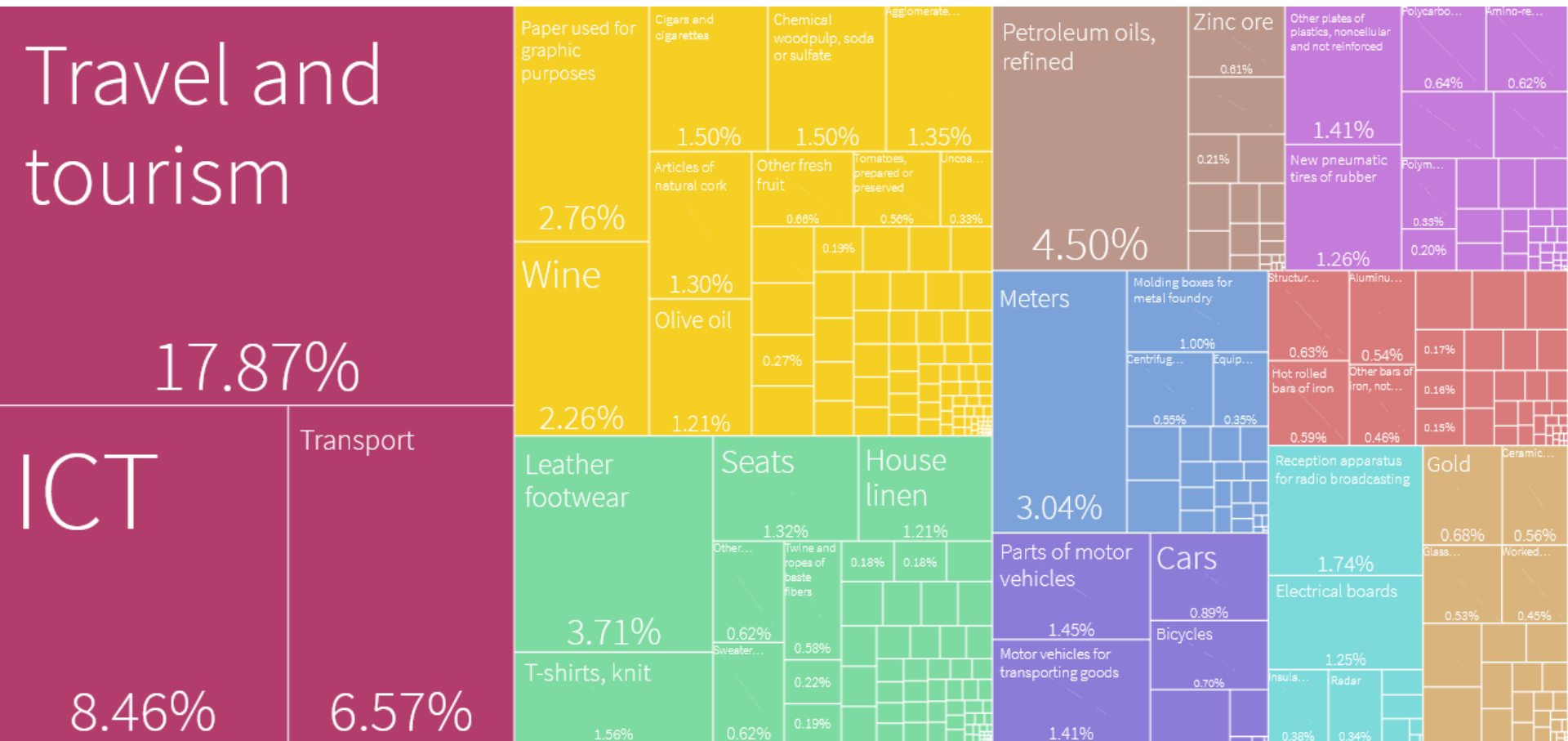
- Americas
- Asia
- Africa
- Europe
- Oceania

SEARCH IN VISUALIZATION 🔍

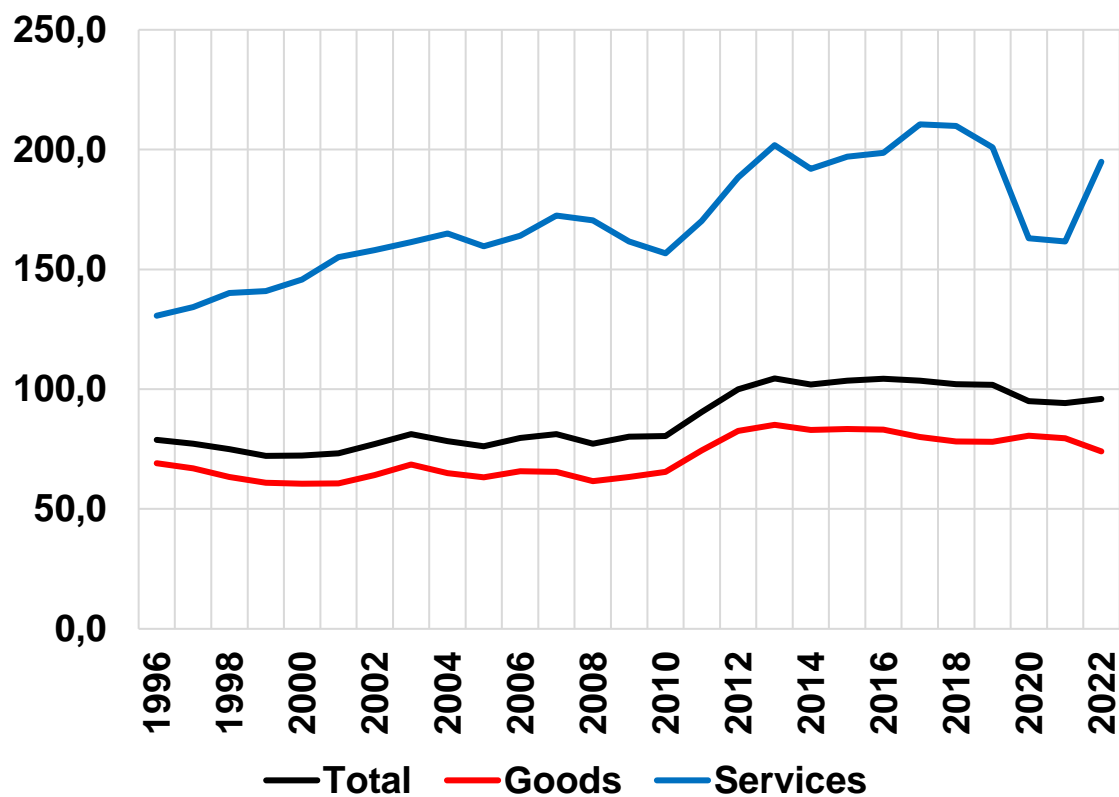


'Atlas of Economic Complexity'
Economic Complexity is a **measure of a society's productive knowledge**. Prosperous societies are those that have the knowledge to make a larger variety of more complex products.

Portugal. Exports in 2020

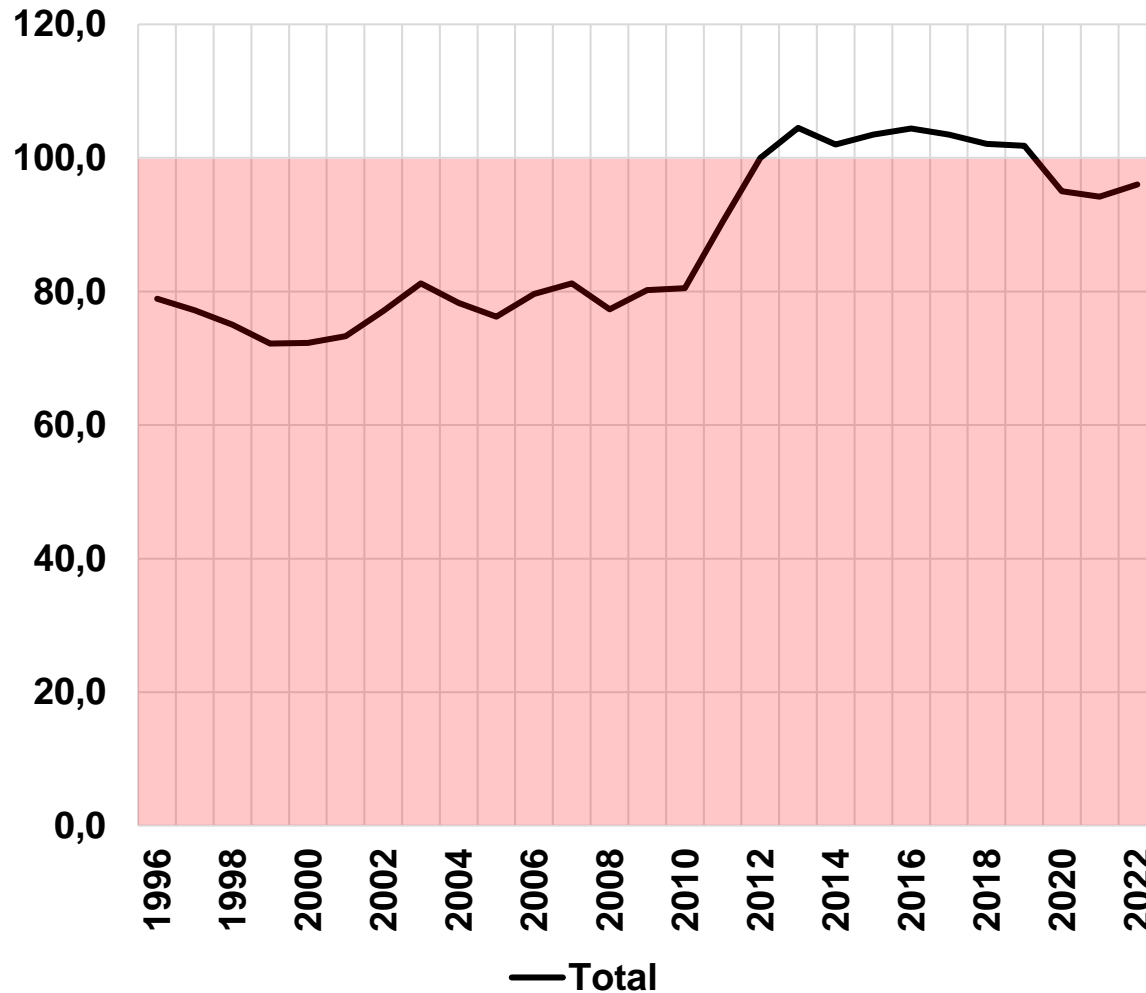


Portugal. Coverage rate of imports by the exports, % Pordata

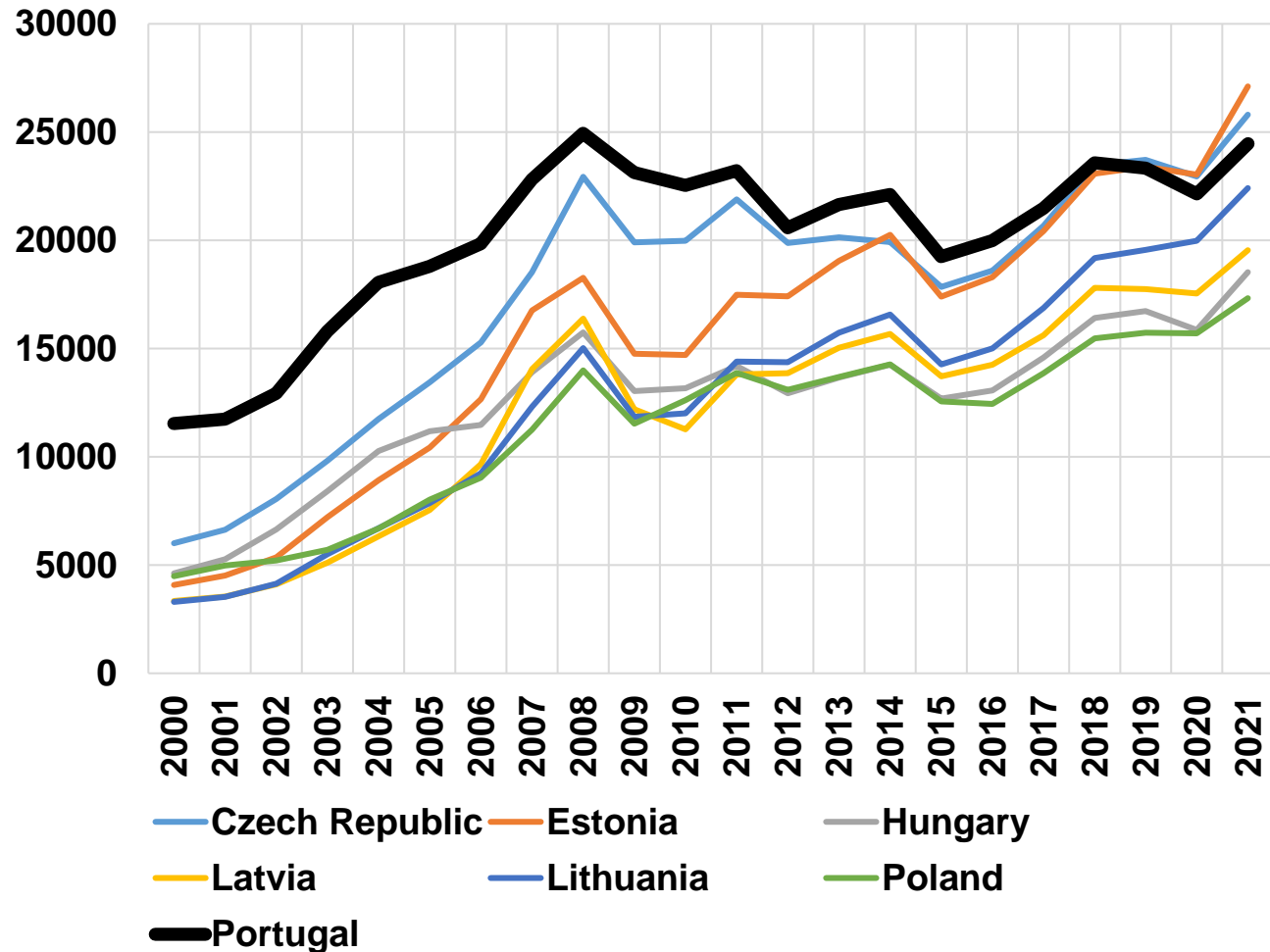


Portugal. Coverage rate of imports by the exports, % .

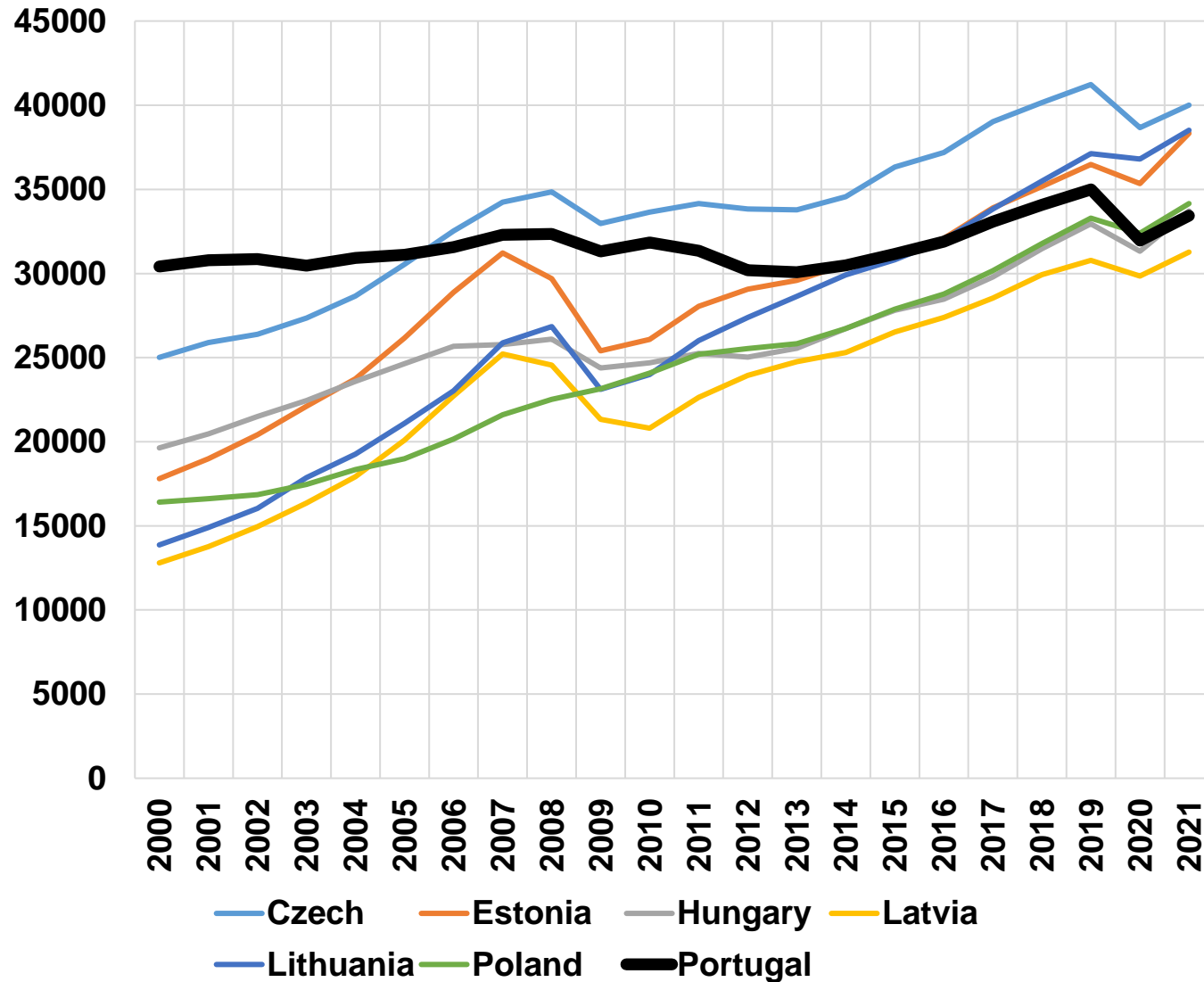
Pordata



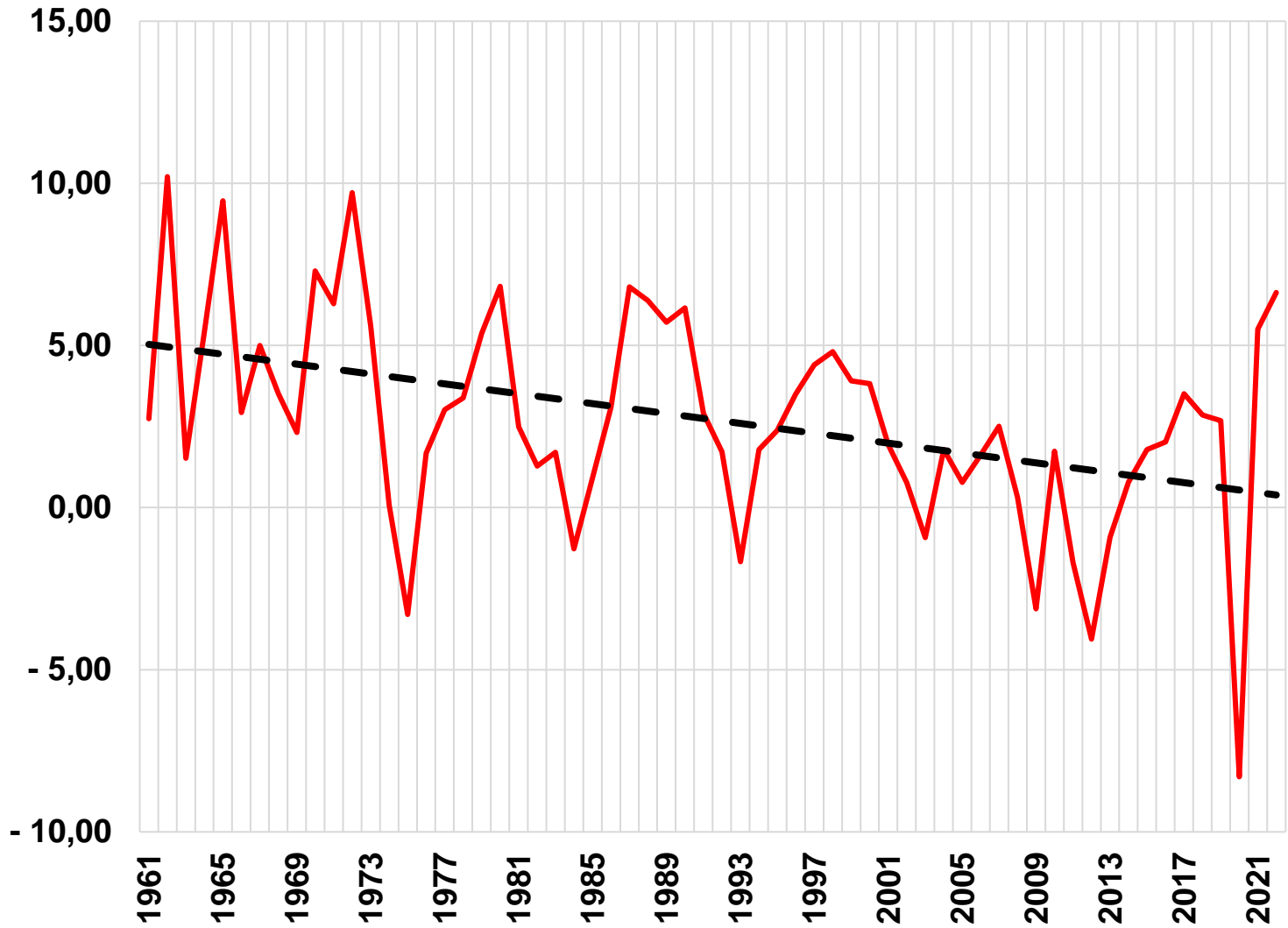
GDP per capita. IMF current prices, USD



GDP per capita, PPP. IMF



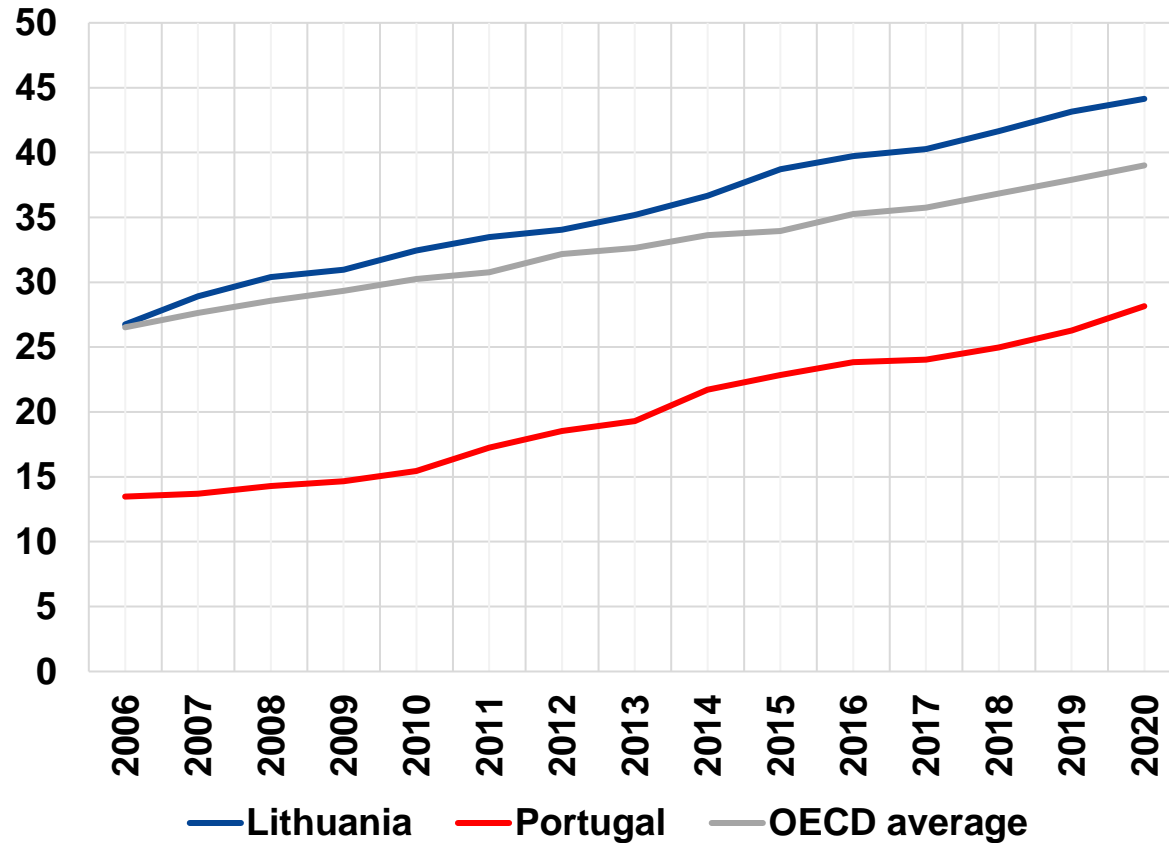
Portugal - taxa de crescimento real do PIB, % Pordata



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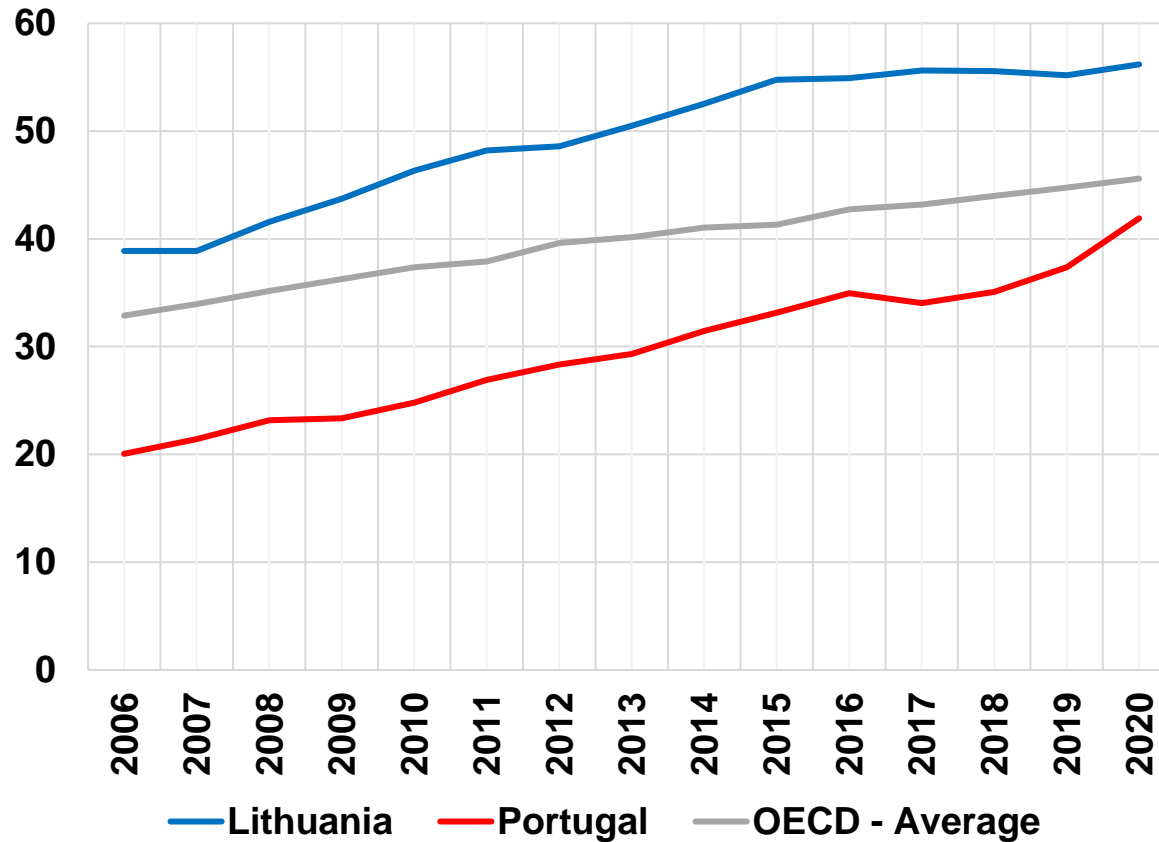
Share of population by educational attainment: tertiary education, 25-64 years. OECD



https://web.fe.up.pt/~ptcastro/de-Castro__Dnipro_Sept-2022.pdf

de Castro, Paulo M. S. T., 'Portugal 2022: human capital, economic development and migrations', in 'International Migration and Development of Human Potential', Dnipro, Ukraine, Sept. 14-15 2022

Share of population by educational attainment: tertiary education, 25-34 years. OECD

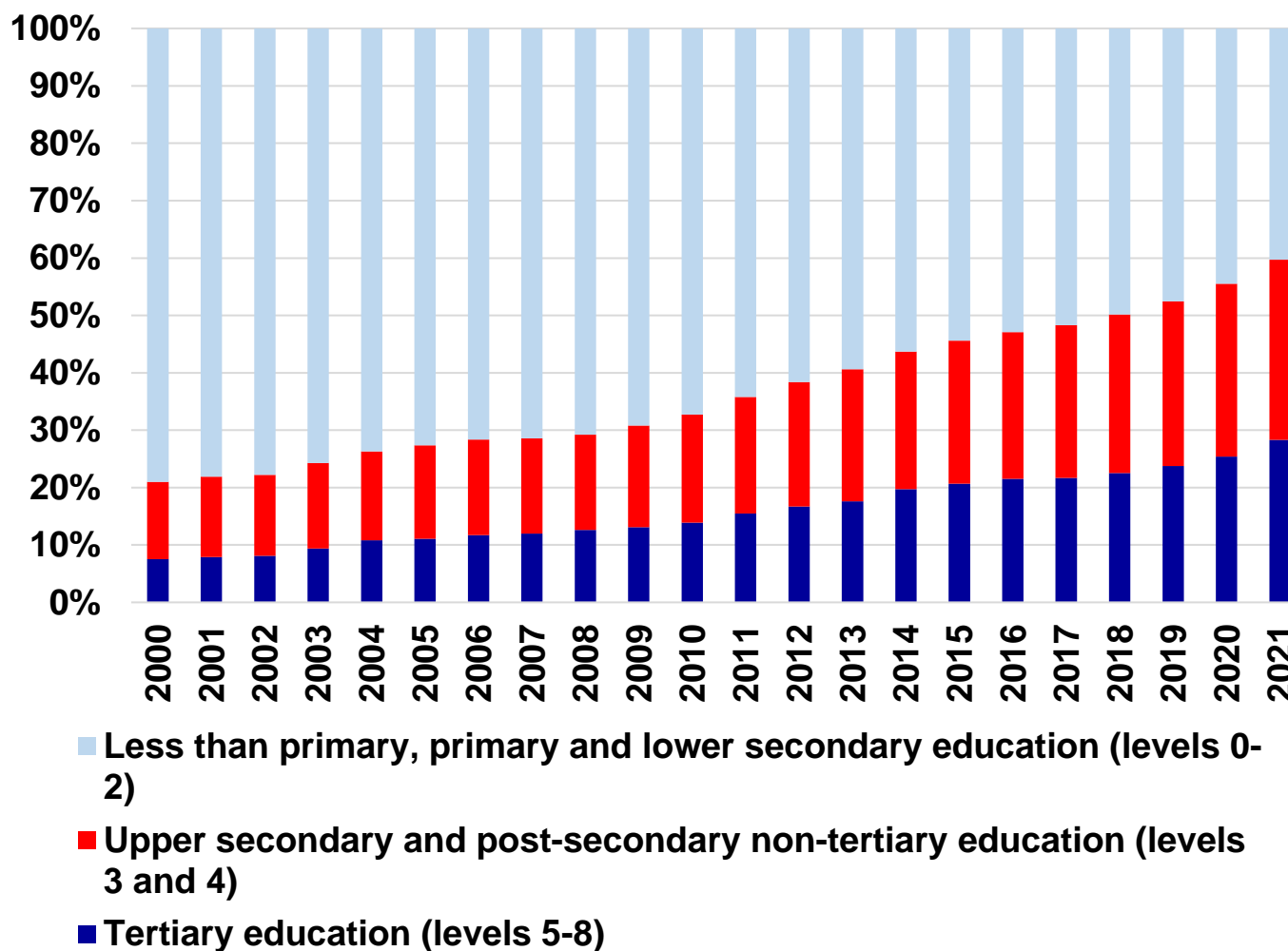


https://web.fe.up.pt/~ptcastro/de-Castro__Dnipro_Sept-2022.pdf

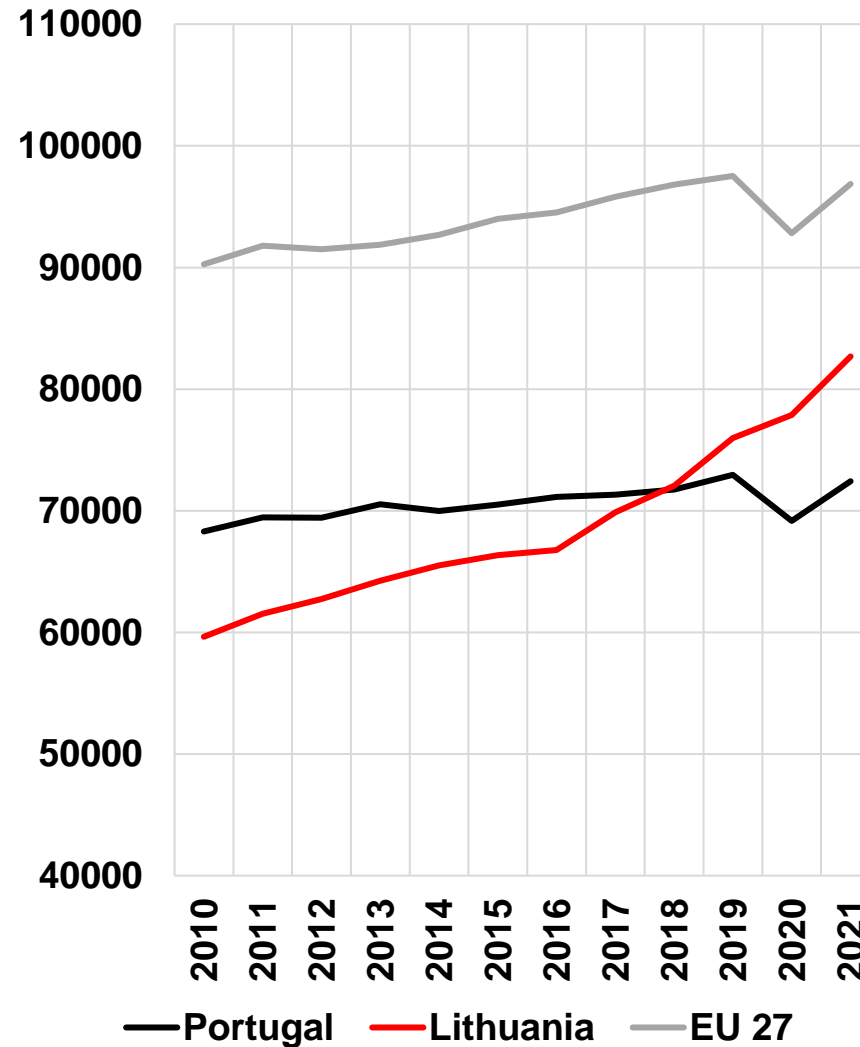
de Castro, Paulo M. S. T., 'Portugal 2022: human capital, economic development and migrations', in 'International Migration and Development of Human Potential', Dnipro, Ukraine, Sept. 14-15 2022

Portugal: population by educational attainment level, 15-64 years

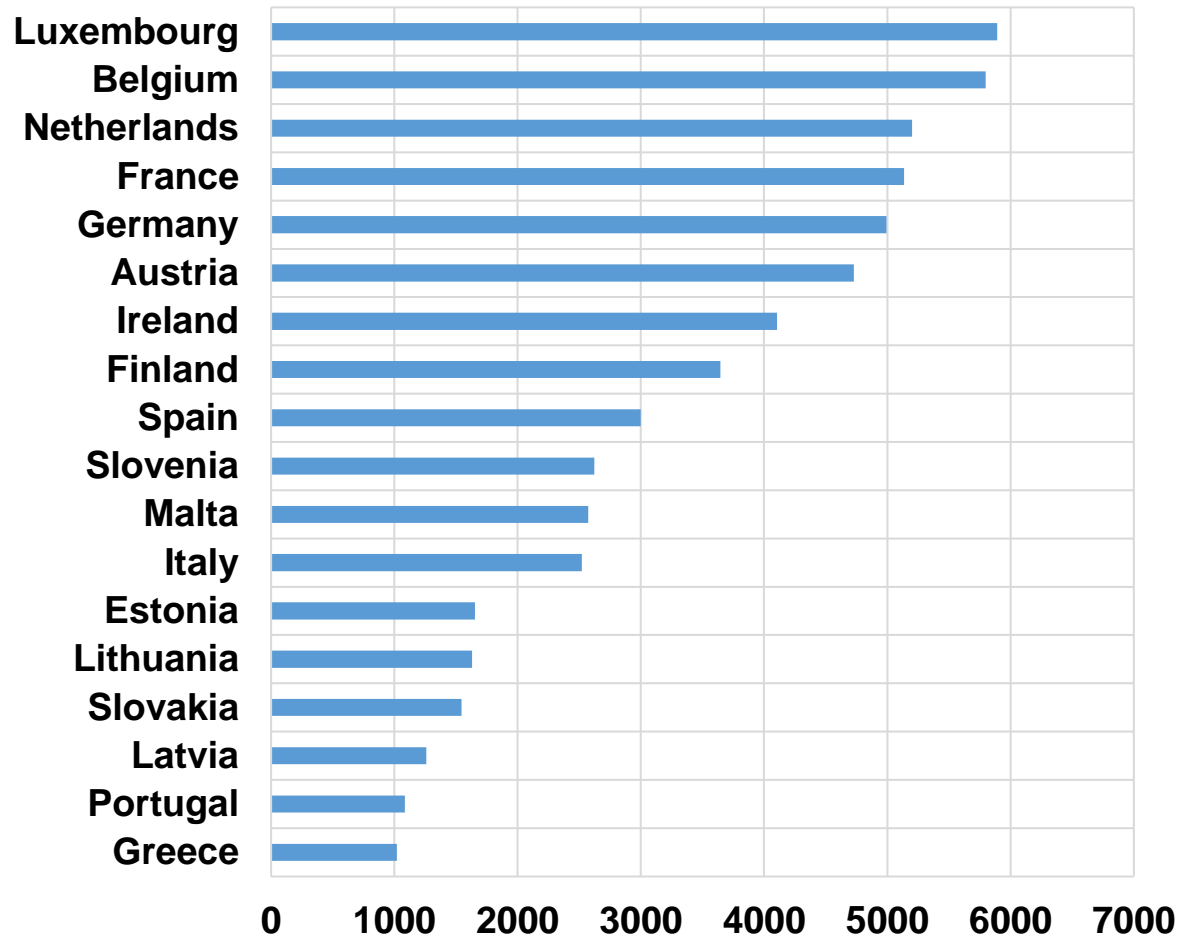
Eurostat, EDAT_LFSE_03, 2022-09-03



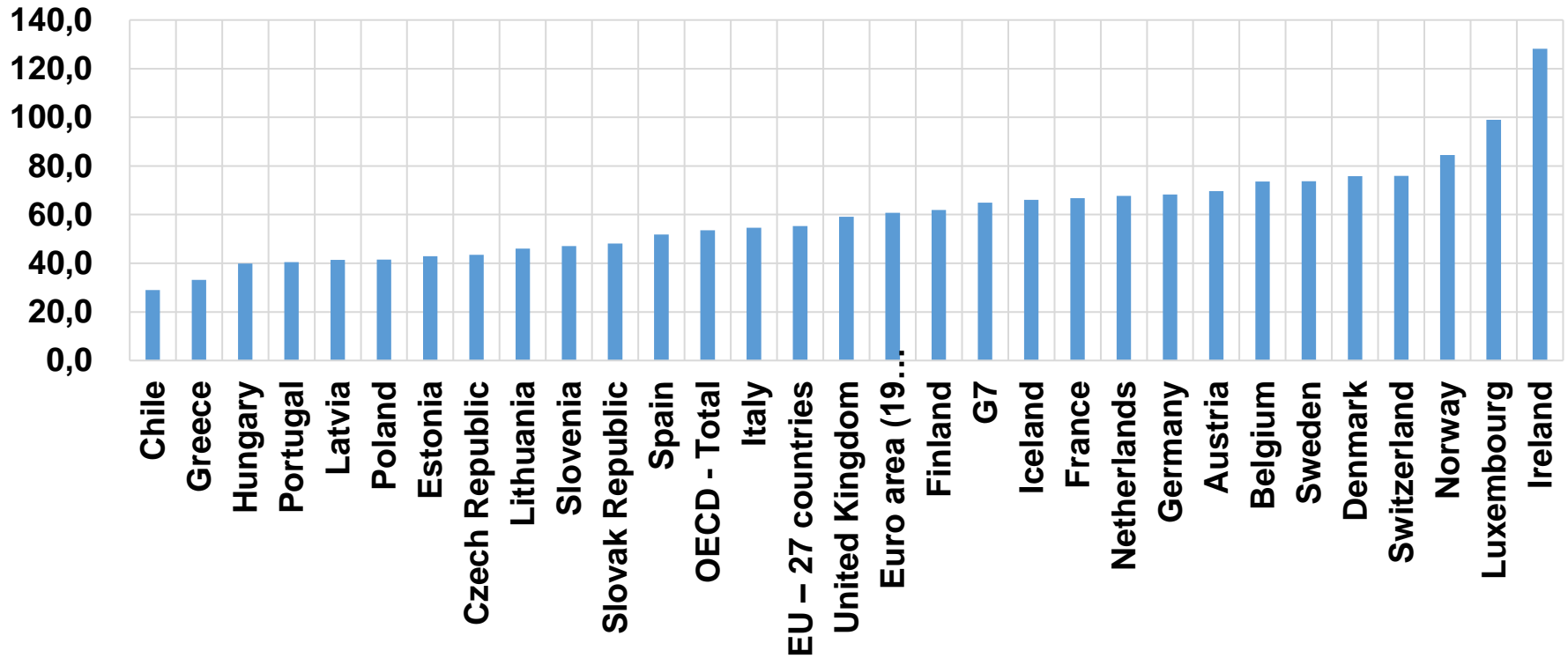
Productivity ILO, PPP



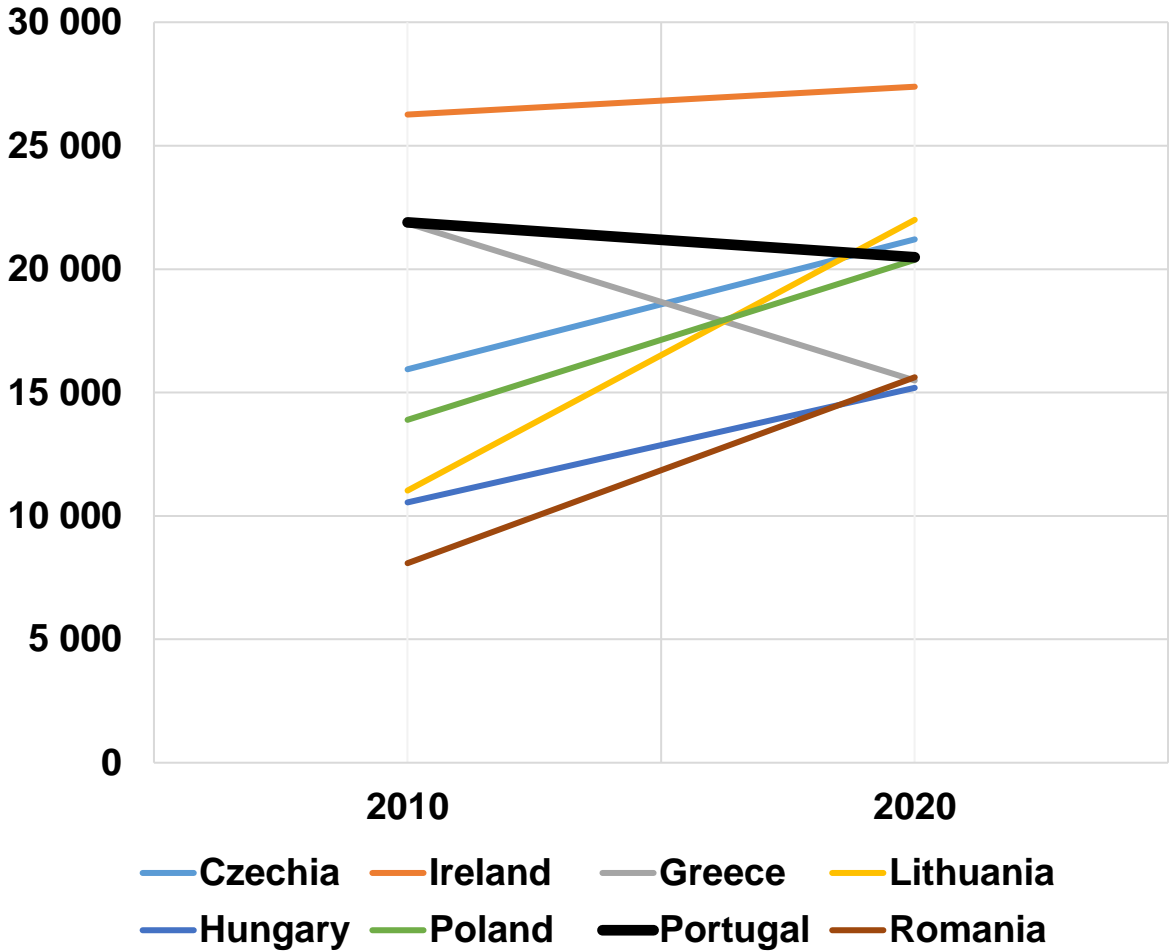
**Average monthly earnings of employees.
2020
US dollars. ILO
Eurogroup countries**



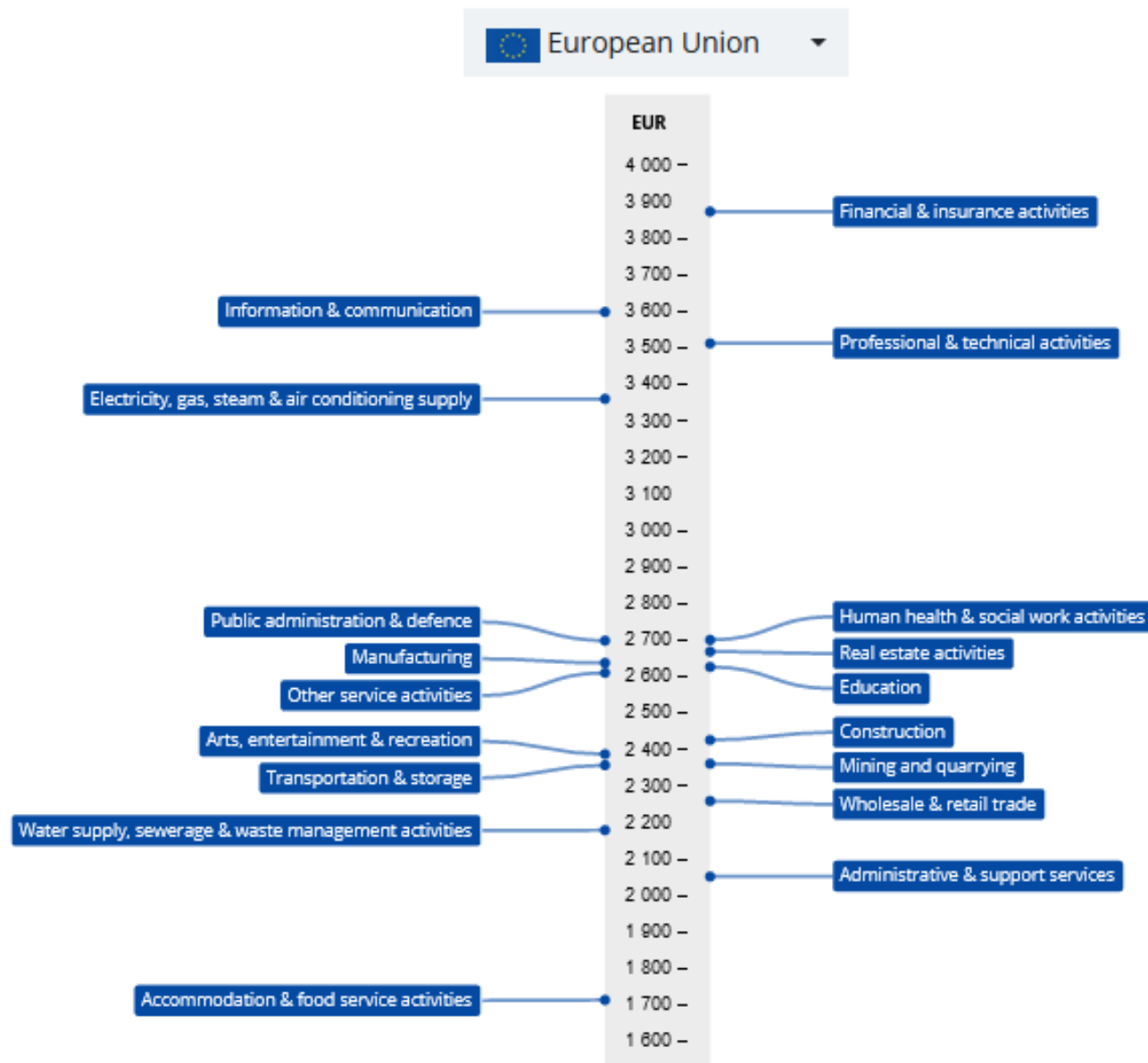
**GDP per hour worked. OECD.
USD constant prices, 2015, PPP.**



Income by educational attainment level Tertiary education, Purchasing power standard EUROSTAT (EU-SILC survey)

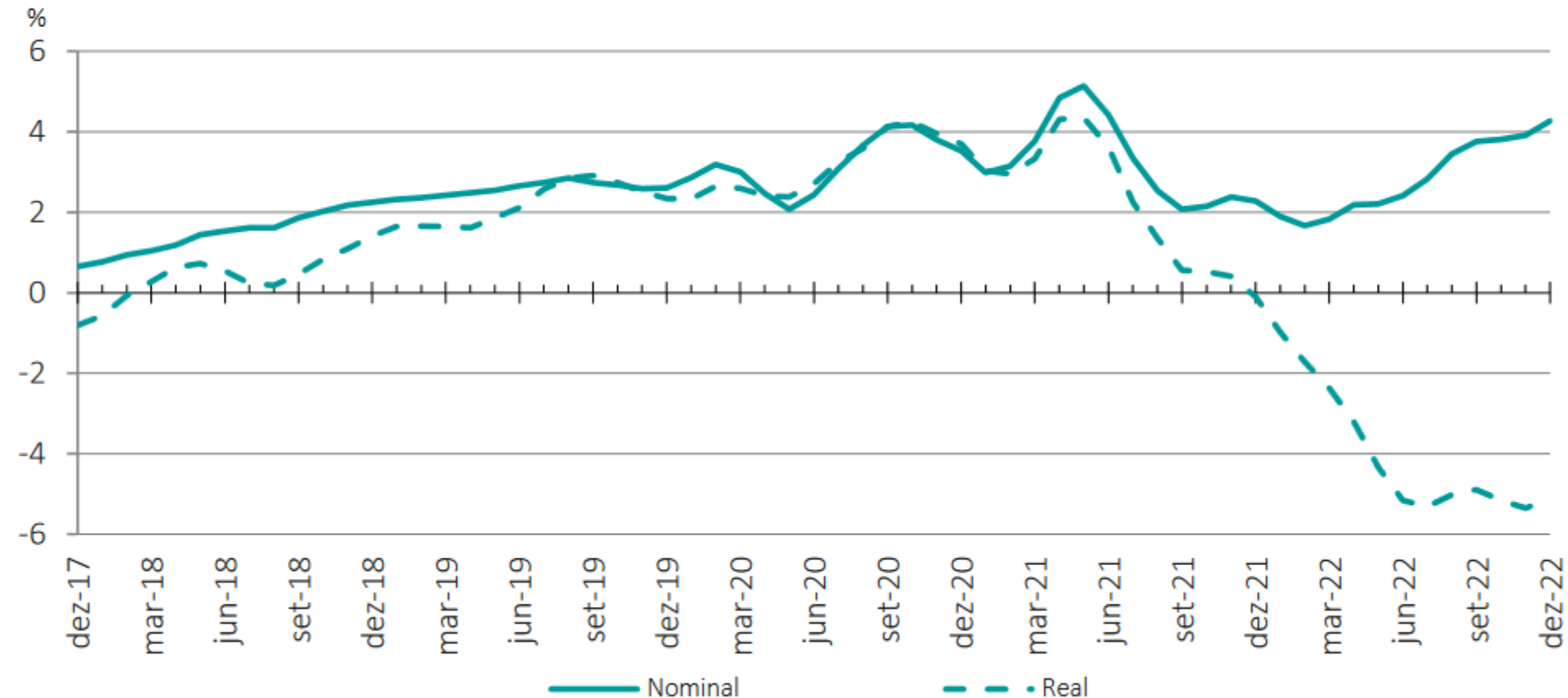


Mean monthly earnings by activity, 2018



Source: Eurostat - [access to dataset](#)

Figura 3. Variação homóloga da remuneração bruta regular mensal média por trabalhador (nominal e real)



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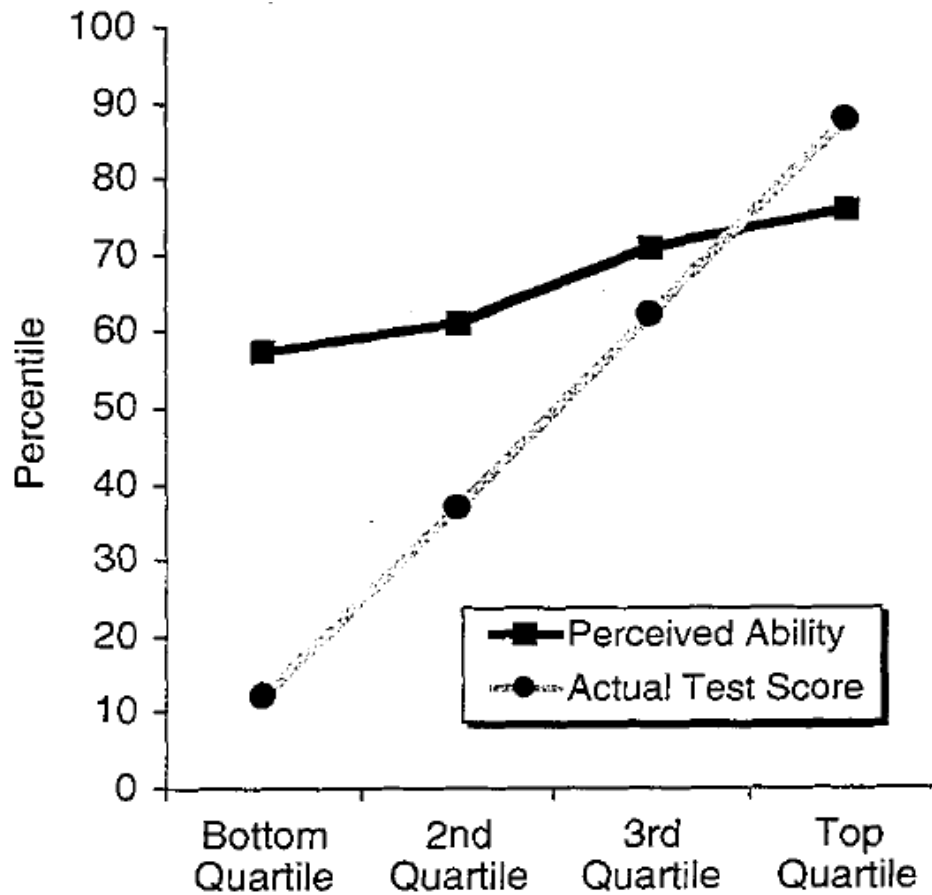
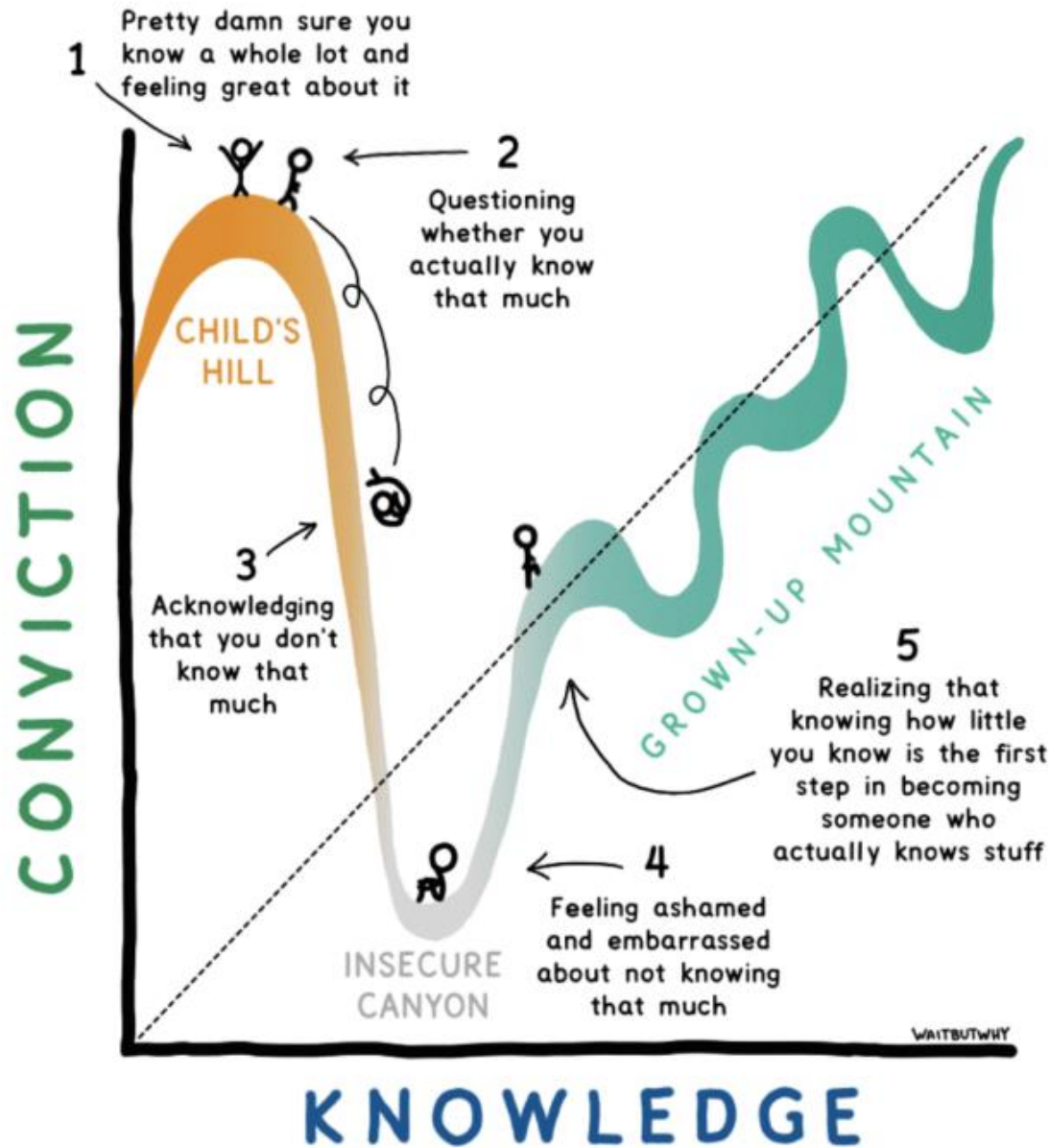


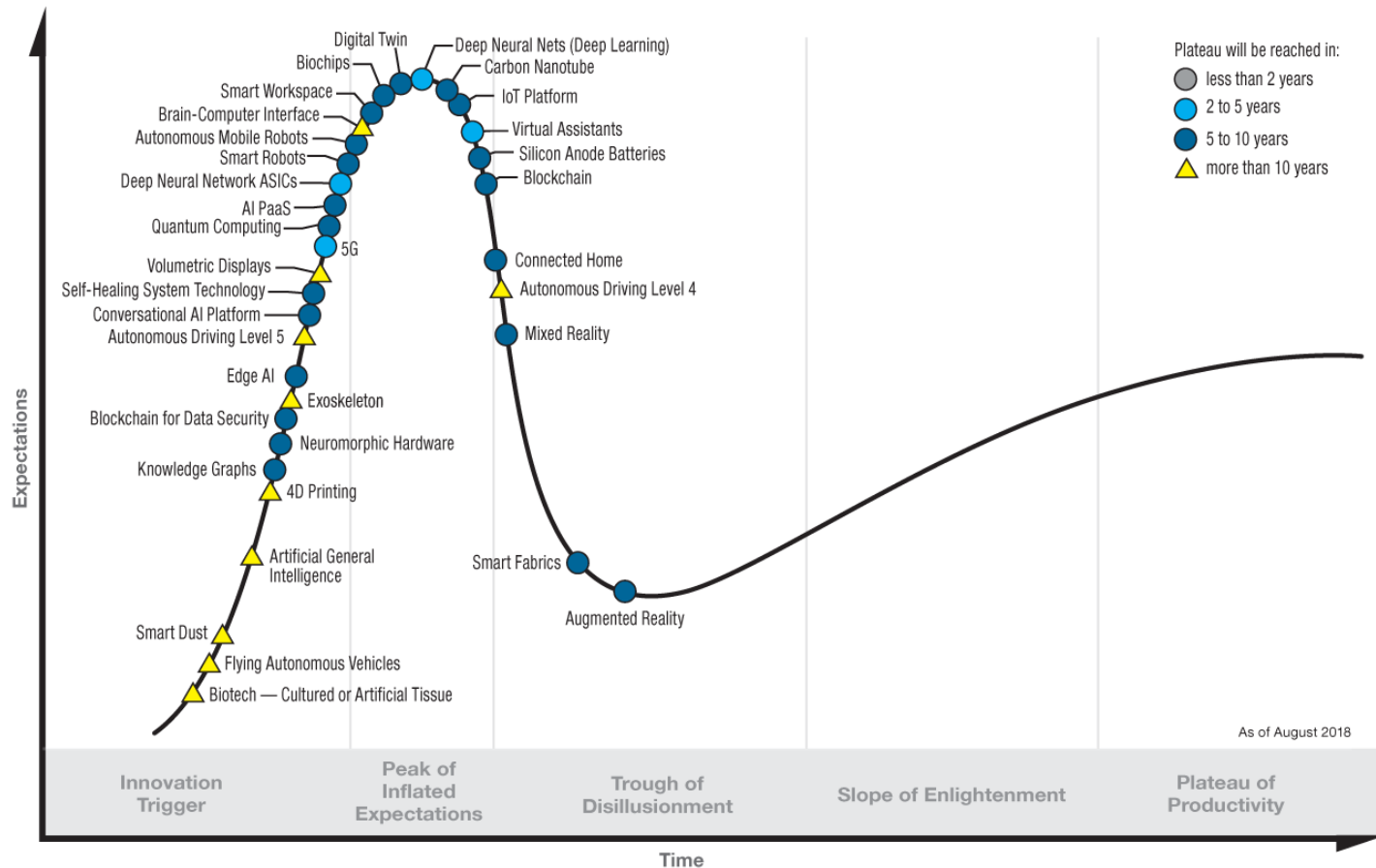
Figure 1. Perceived ability to recognize humor as a function of actual test performance (Study 1).

<https://doi.org/10.1037/0022-3514.77.6.1121>

Kruger, Dunning, 'Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments', Journal of Personality and Social Psychology, 1999, vol.77, 6, pp.1121-1134



Hype Cycle for Emerging Technologies, 2018



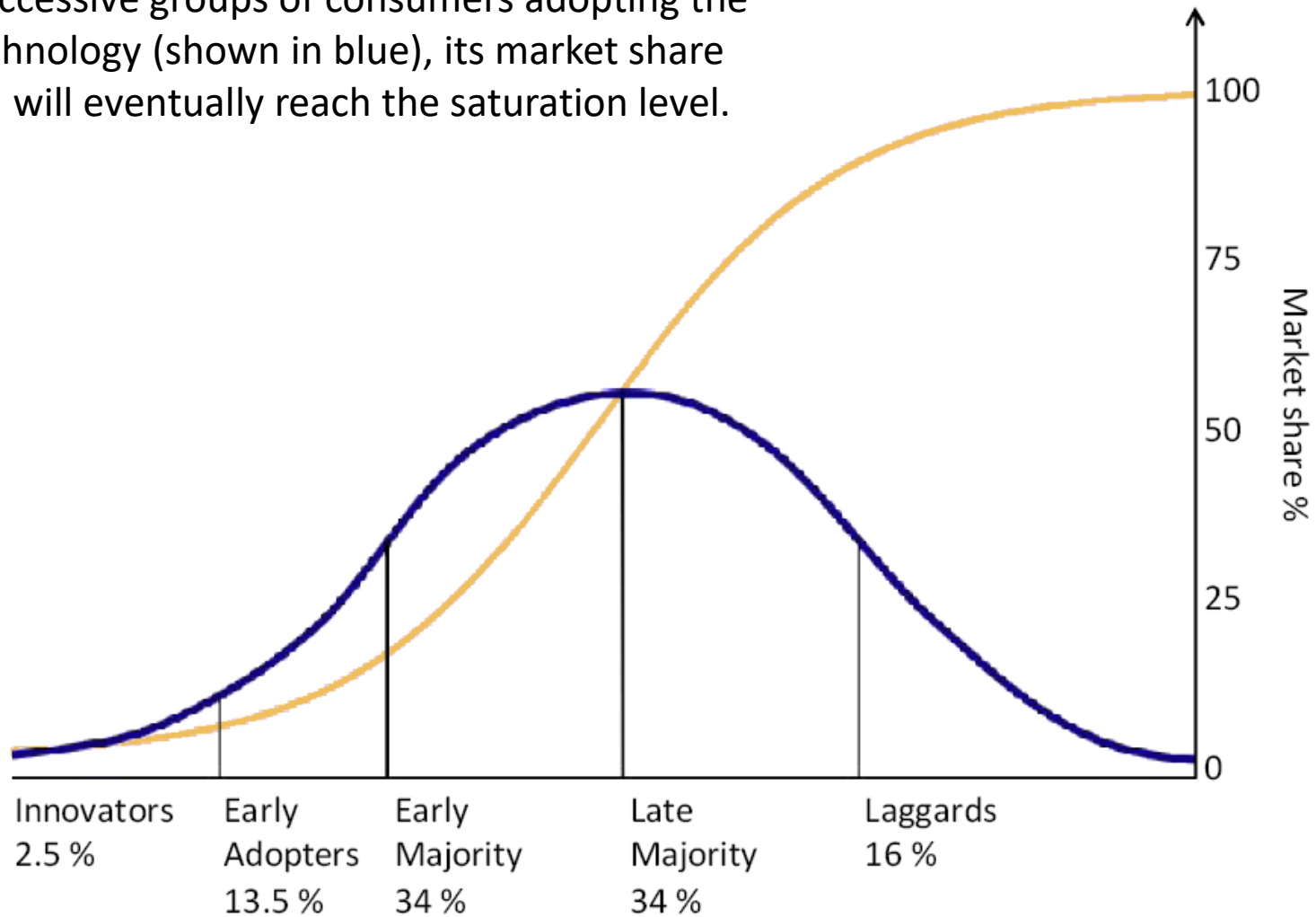
[gartner.com/SmarterWithGartner](https://www.gartner.com/SmarterWithGartner)

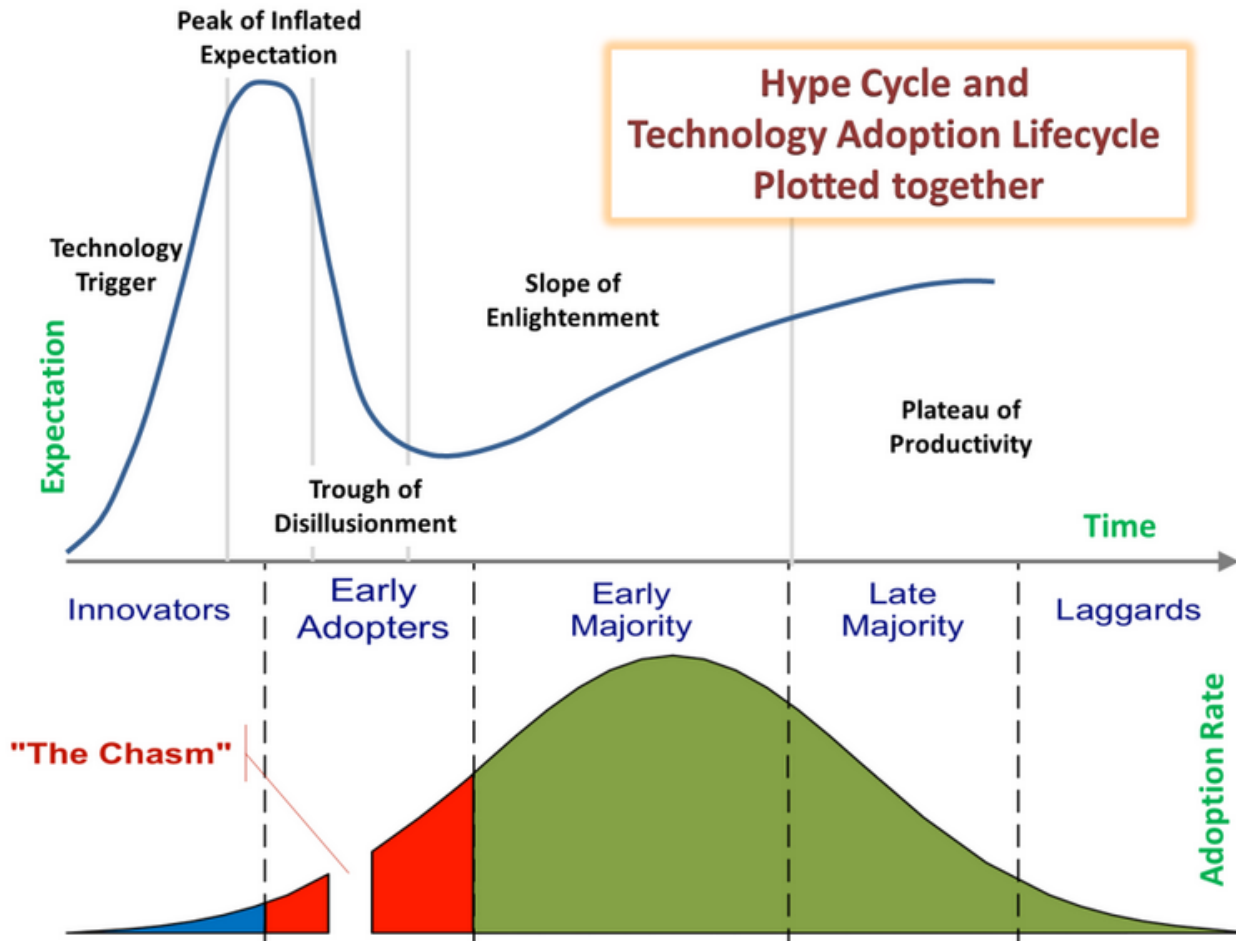
Source: Gartner (August 2018)
© 2018 Gartner, Inc. and/or its affiliates. All rights reserved.



<https://www.gartner.com/smarterwithgartner/5-trends-emerge-in-gartner-hype-cycle-for-emerging-technologies-2018>

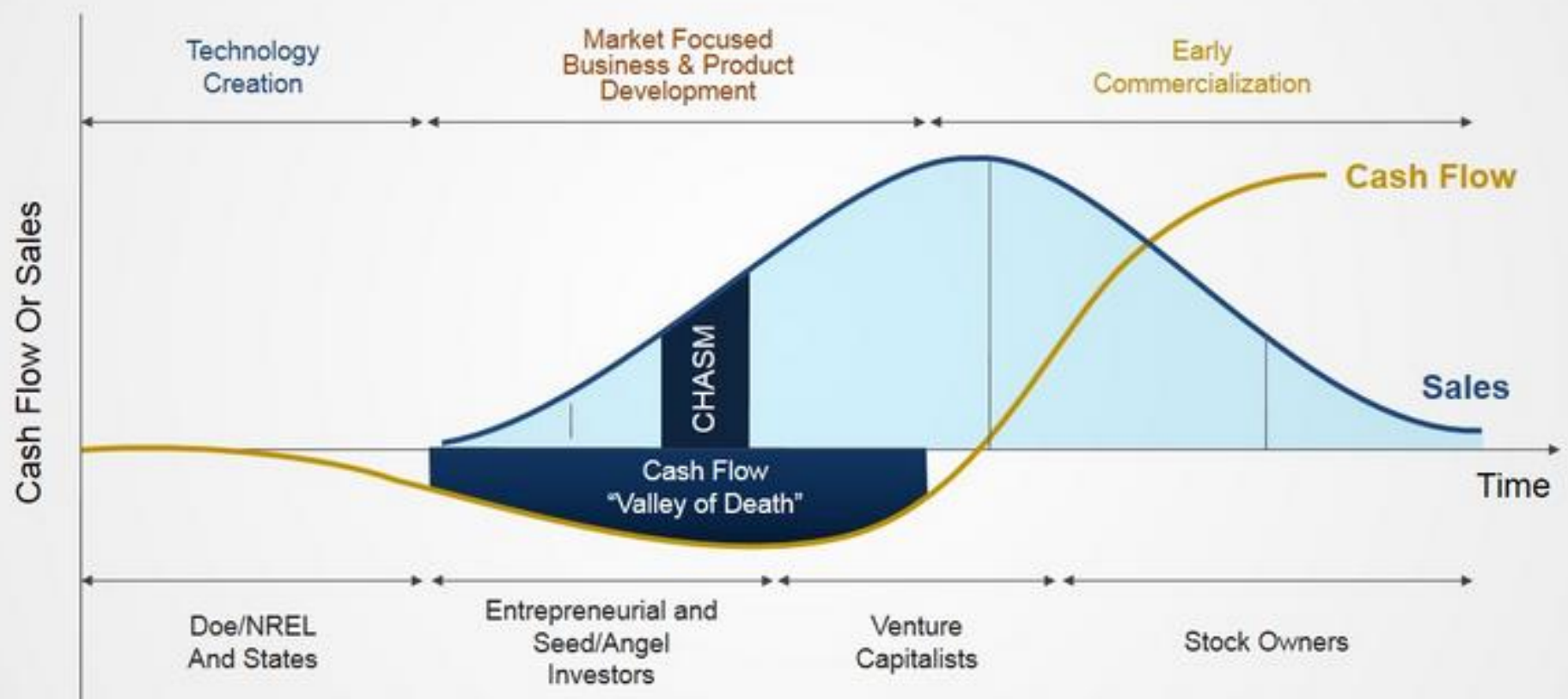
The diffusion of innovations according to Rogers. With successive groups of consumers adopting the new technology (shown in blue), its market share (yellow) will eventually reach the saturation level.

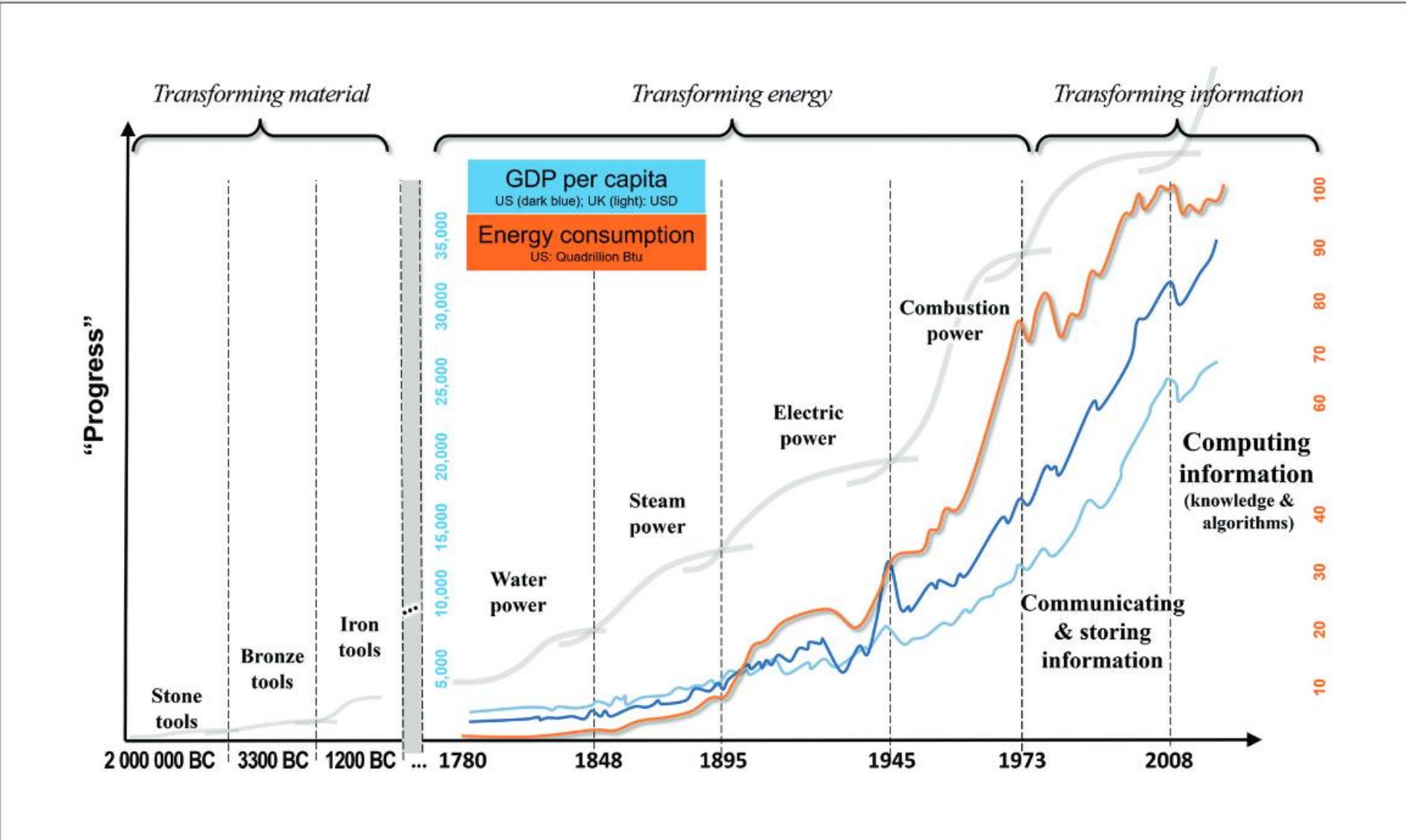


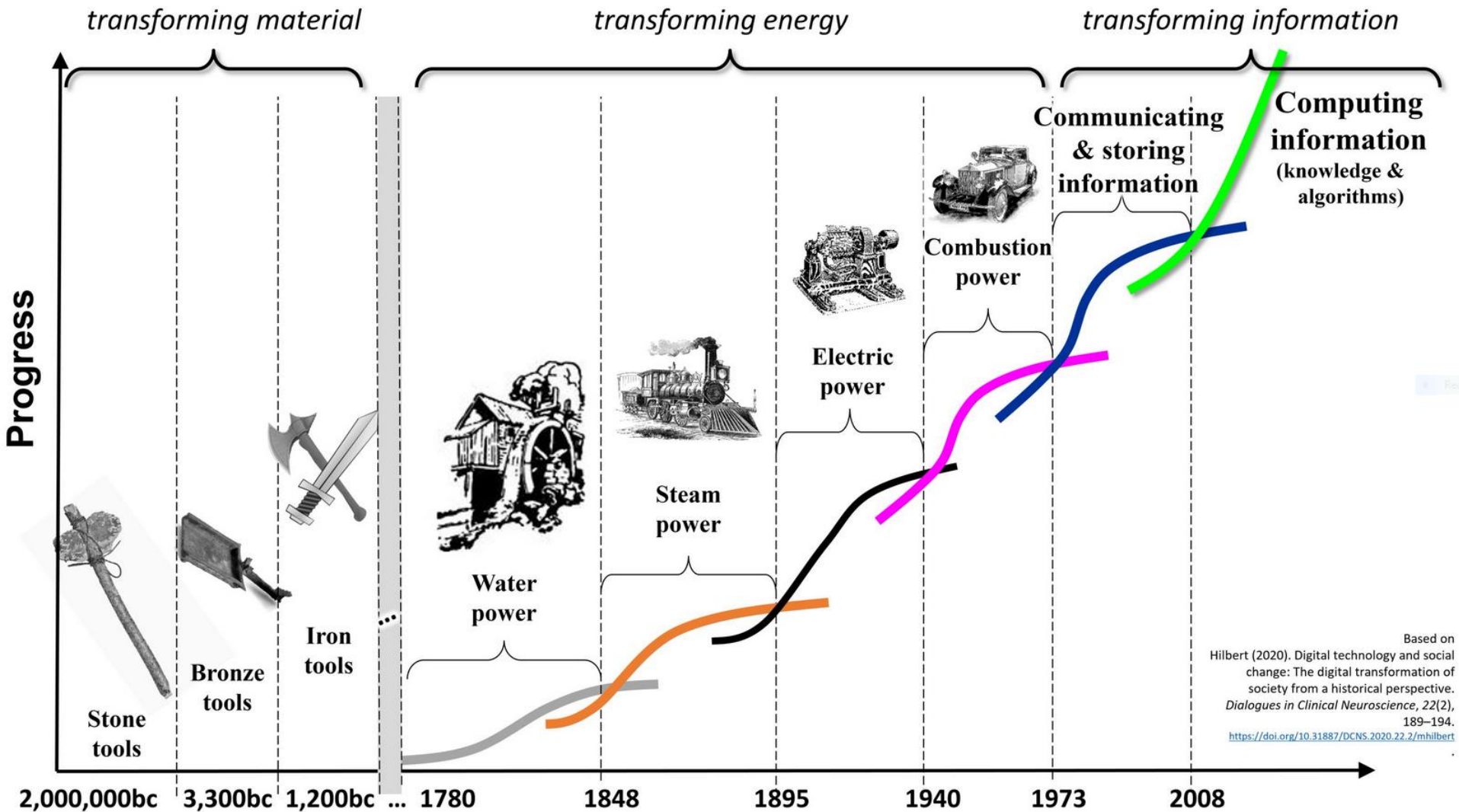


Though the curve looks different and one is plotting “Expectation” and the other is plotting “Adoption Rate”

A. Vallecillo, ‘On the industrial adoption of model driven engineering. Is your company ready for MDE?’, International Journal of Information Systems and Software Engineering for Big Companies, vol. 1, 1, pp.52-68, 2014
<https://setandbma.wordpress.com/2012/05/28/technology-adoption-shift/>





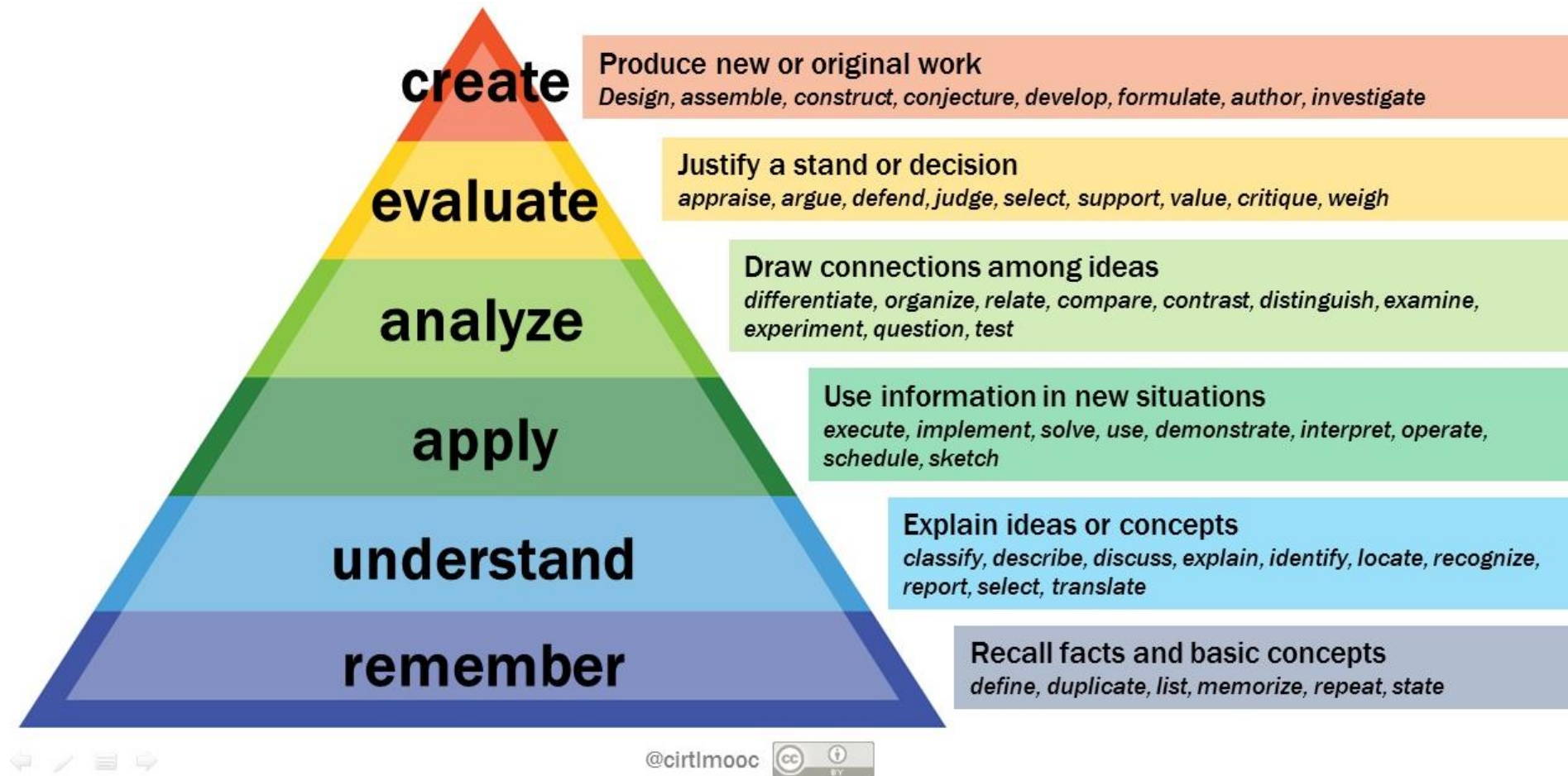


Based on Hilbert (2020). Digital technology and social change: The digital transformation of society from a historical perspective. *Dialogues in Clinical Neuroscience*, 22(2), 189–194. <https://doi.org/10.31887/DCNS.2020.22.2/mhilbert>

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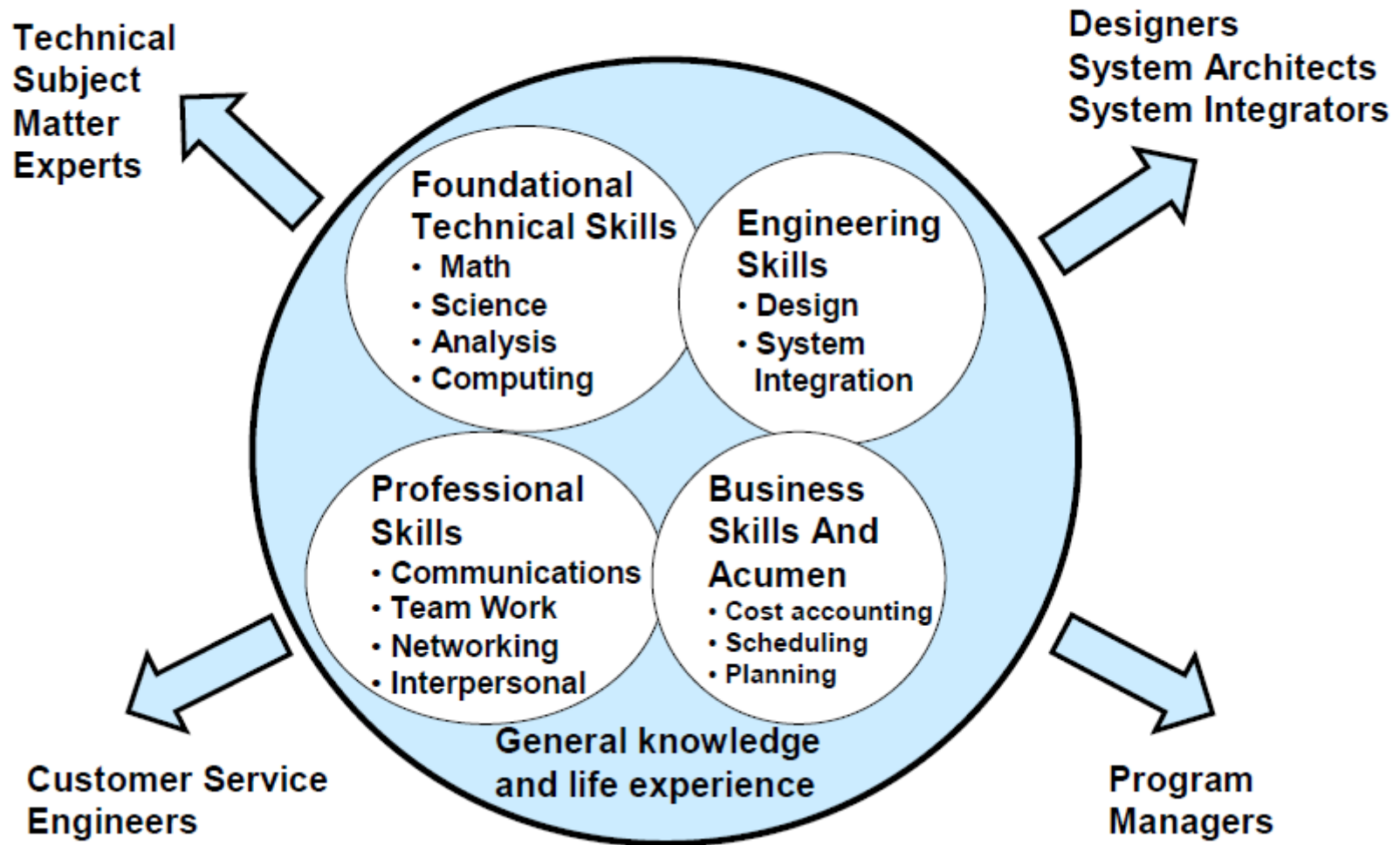
Bloom's taxonomy



Boeing List of “Desired Attributes of an Engineer”

- **A good understanding of engineering science fundamentals**
 - Mathematics (including statistics)
 - Physical and life sciences
 - Information technology (far more than “computer literacy”)
 - **A good understanding of design and manufacturing processes** (i.e. understands engineering)
 - **A multi-disciplinary, systems perspective**
 - **A basic understanding of the context** in which engineering is practiced
 - Economics (including business practice)
 - History
 - The environment
 - Customer and societal needs
 - **Good communication skills**
 - Written
 - Oral
 - Graphic
 - Listening
 - **High ethical standards**
 - **An ability to think both critically and creatively - independently and cooperatively**
 - **Flexibility. The ability and self-confidence to adapt to rapid or major change**
 - **Curiosity and a desire to learn for life**
 - **A profound understanding of the importance of teamwork.**
- Diversity – wanted and needed !**

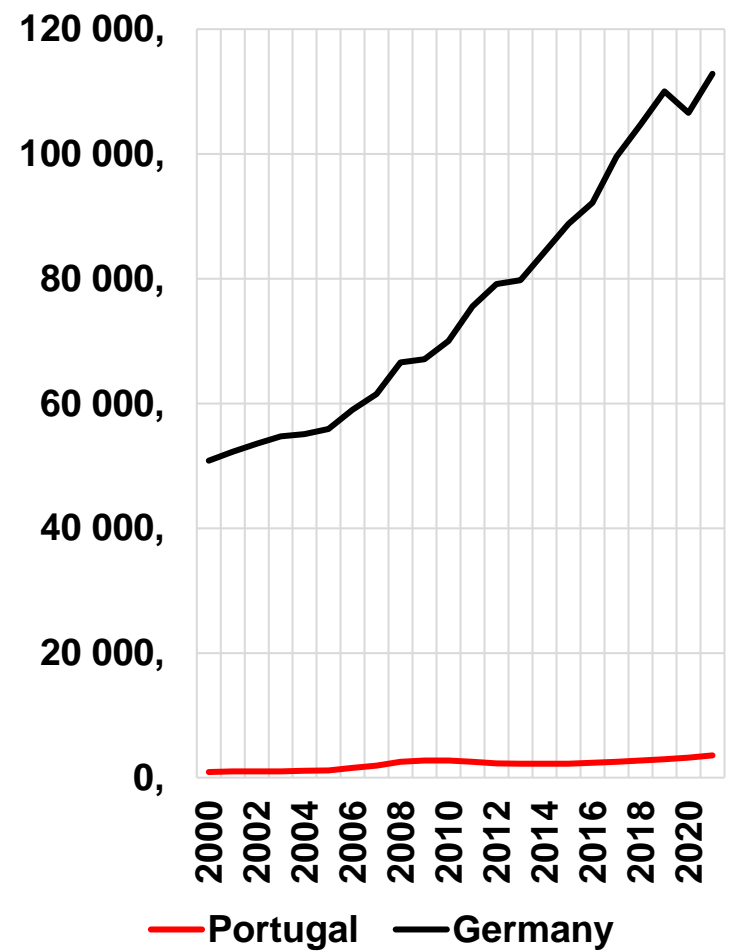
Knowledge of Many Skills with Career Choices Based on Talent and Ability



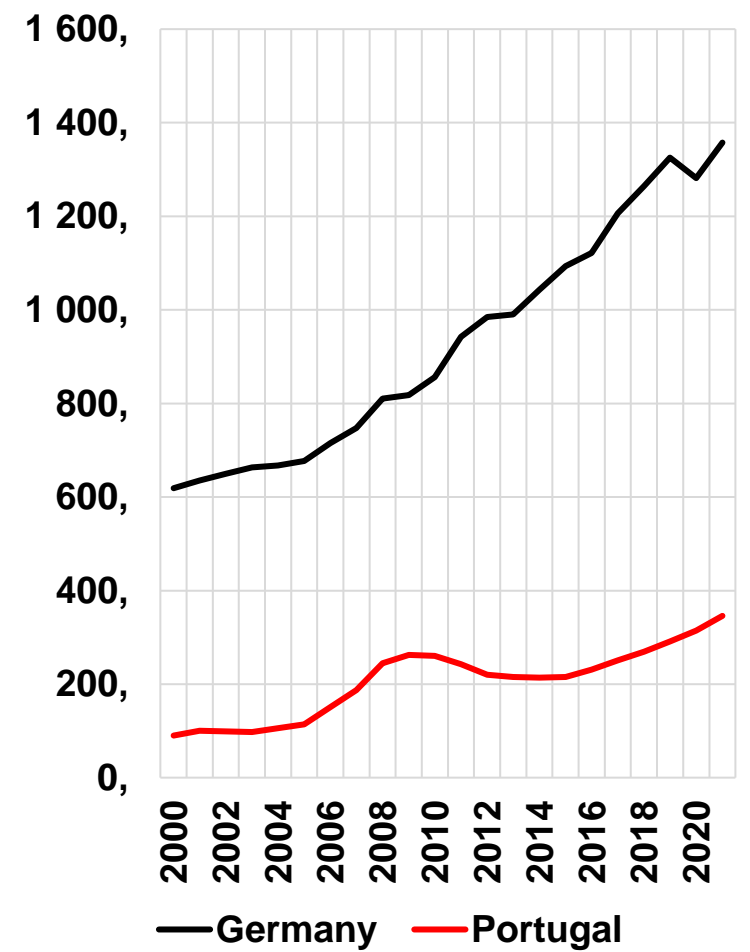
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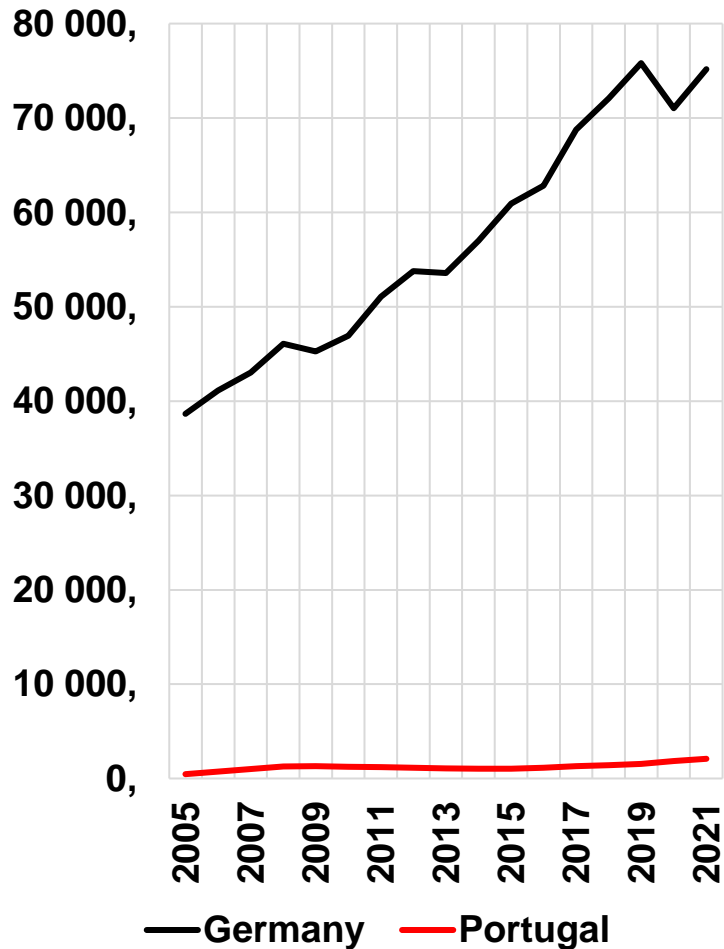
Gross domestic expenditure on R&D (GERD) Million euro



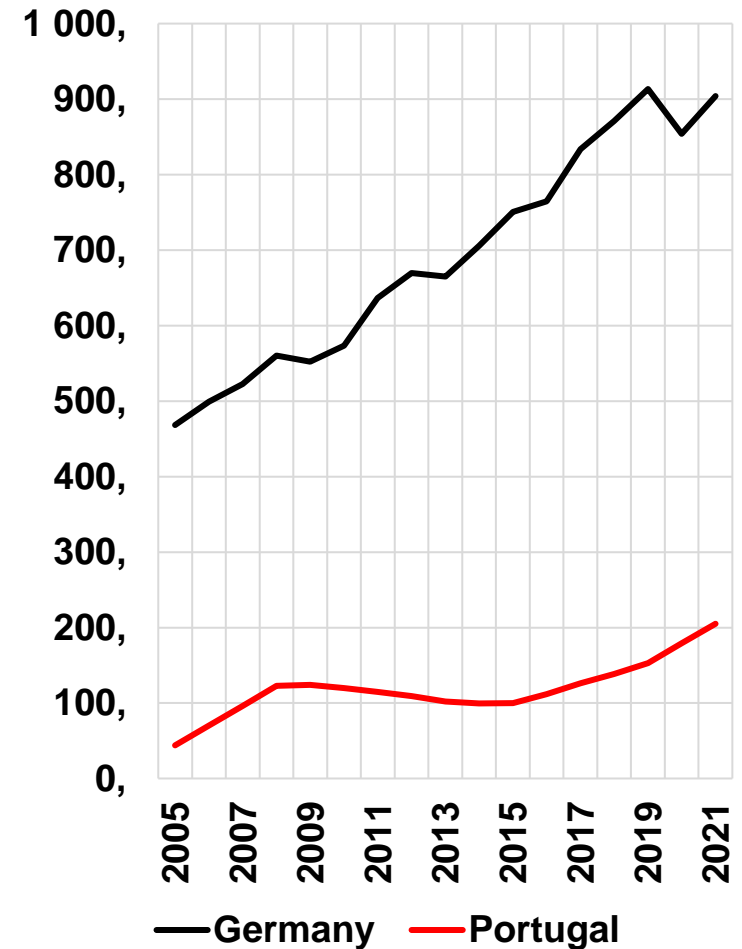
Gross domestic expenditure on R&D (GERD) Euro per inhabitant



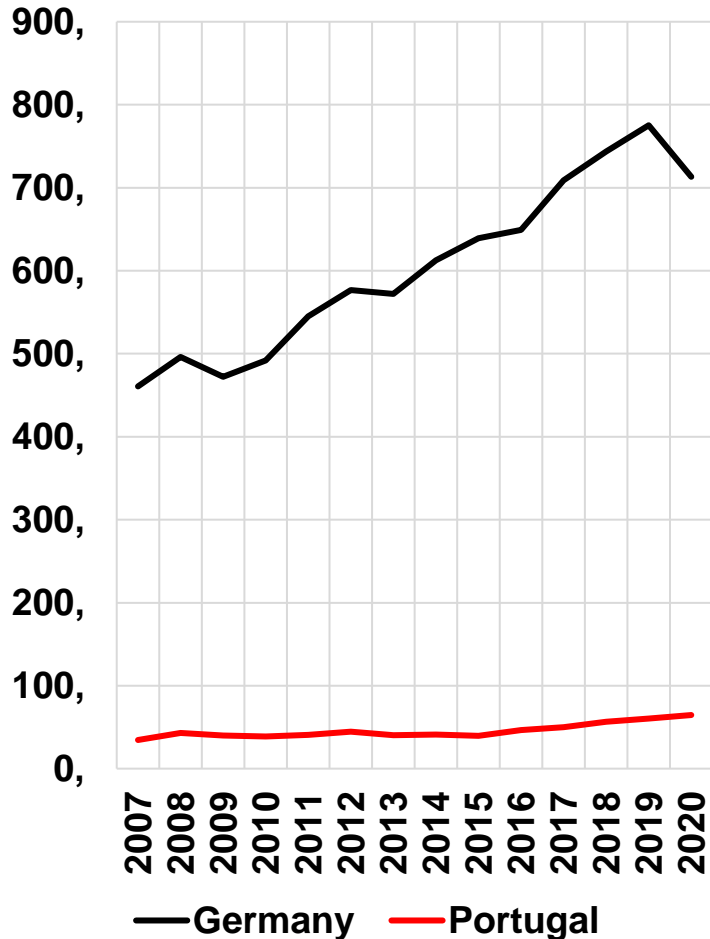
**Business enterprise
expenditure on R&D
(BERD)
Million euro**



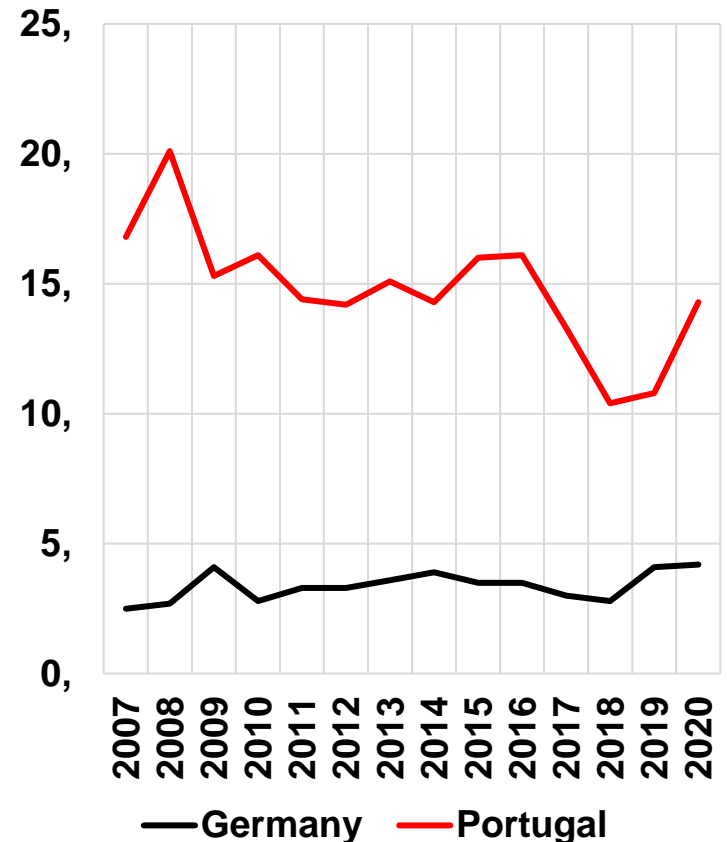
**Business enterprise
expenditure on R&D
(BERD)
Euro per inhabitant**



**Business enterprise
expenditure on R&D
(BERD). Manufacturing.
Euro per inhabitant**



**Business enterprise
expenditure on R&D
(BERD)
Financial and insurance
activities.
Euro per inhabitant**



	GDP 2021 The World Bank current USD	Population 2021 The World Bank	GDP per capita 2021 The World Bank current USD
Germany	4,26 x 10¹²	83,196 x 10⁶	51,2 x 10³
Portugal	253,7 x 10⁹	10,325 x 10⁶	24,6 x 10³

ratio	GDP	population	GDP per capita
Germany/Portugal	16,8 x	8,1 x	2,1 x

Ratios (2020)	Germany	Portugal
Manufacturing/BERD	59314/71032 83,5%	666,2/1843,6 36,1%
Financial/BERD	352/71032 0,5%	147,7/1843,6 9,0%

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Reforma da Justiça

Grupo de Trabalho Justiça _ 1/10/2021

Coordenador: Jorge Blek

Relator: Henrique Candeias, Luís Barreto Xavier

INTRODUÇÃO

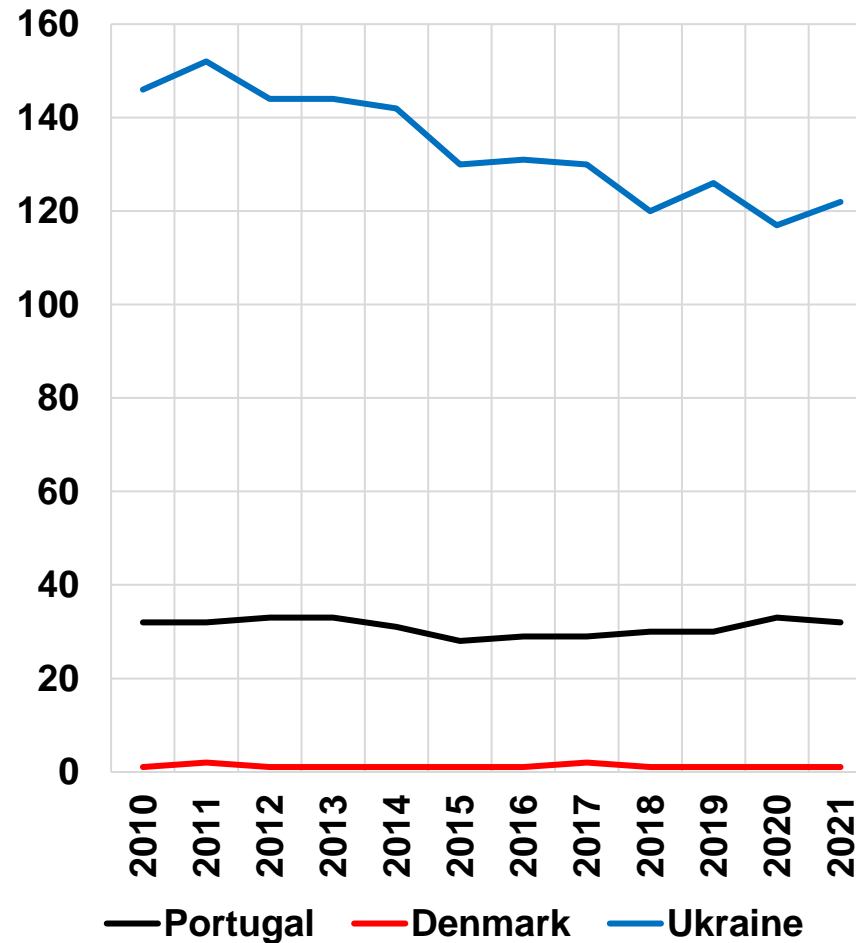
Neste documento propõe-se uma verdadeira mudança de paradigma da Justiça, uma revolução, que deverá conduzir a uma reforma participada do sistema judicial e do sistema judiciário.

Para o efeito, sob direção e enquadramento das “Linhas de Ação” (capítulo I) - eficiência / eficácia, qualidade e transparência -, e após identificação dos “Bloqueios à reforma da Justiça” (capítulo II), i.e. os fatores que impediram que as diversas reformas na justiça que desde há muito são propostas não tivessem ido além do papel, sugerem-se medidas concretas para uma “Nova Política de Justiça” (capítulo III). As medidas são apresentadas no quadro de uma abordagem tópica, mas sistemática, e compreendem desde a “Arquitetura/Estrutura e Direção do Sistema Judiciário”, o “Reforço da Independência” e “Alterações à lei processual”, não omitindo a formação, seleção e carreira dos agentes da justiça, bem como a “Gestão e distribuição dos tribunais” e propostas para a necessária “Digitalização” dos sistemas.

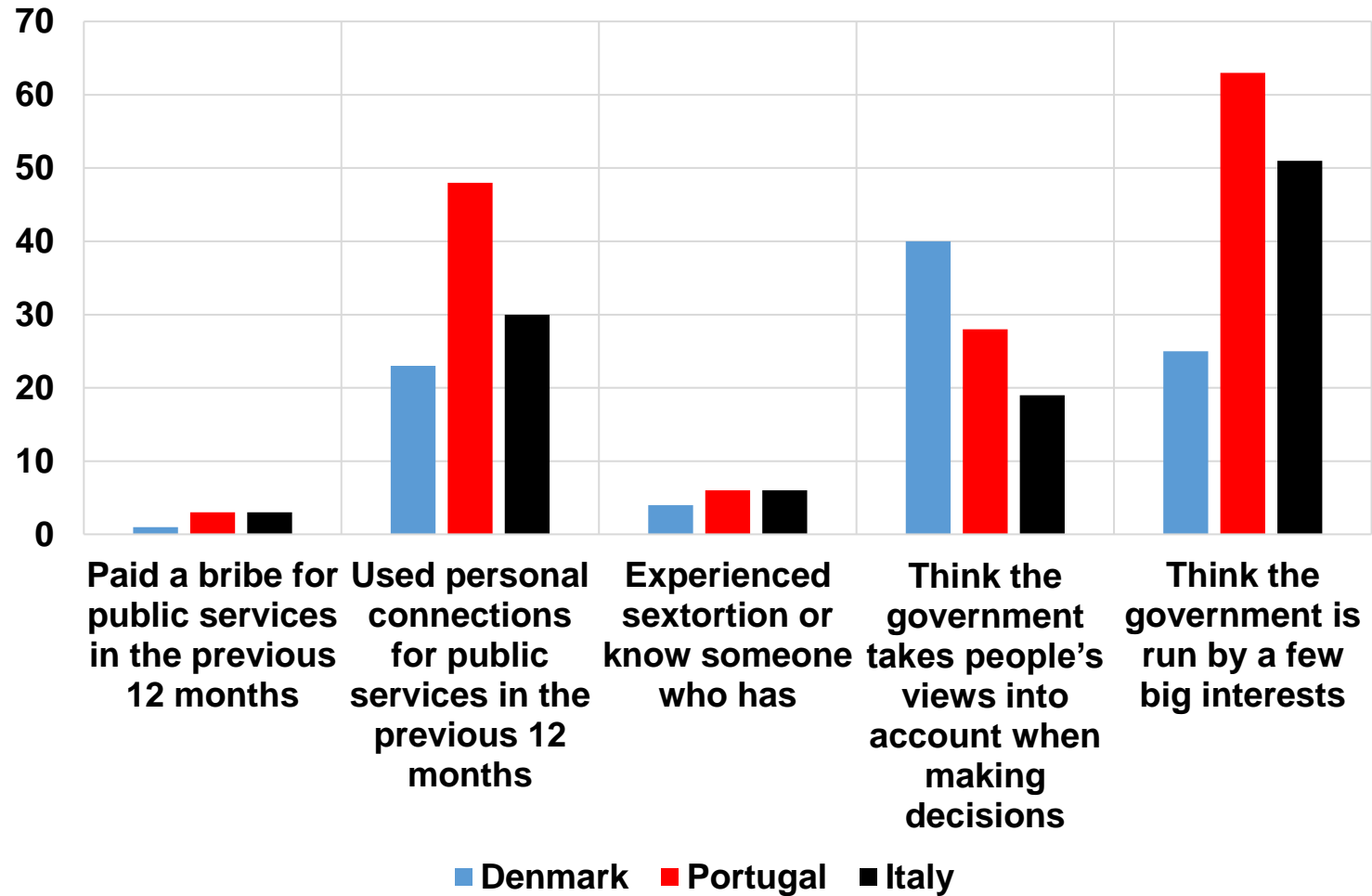
1/33

- **eficiência e eficácia**
- **qualidade**
- **transparência – previsibilidade, acessibilidade, transparência**

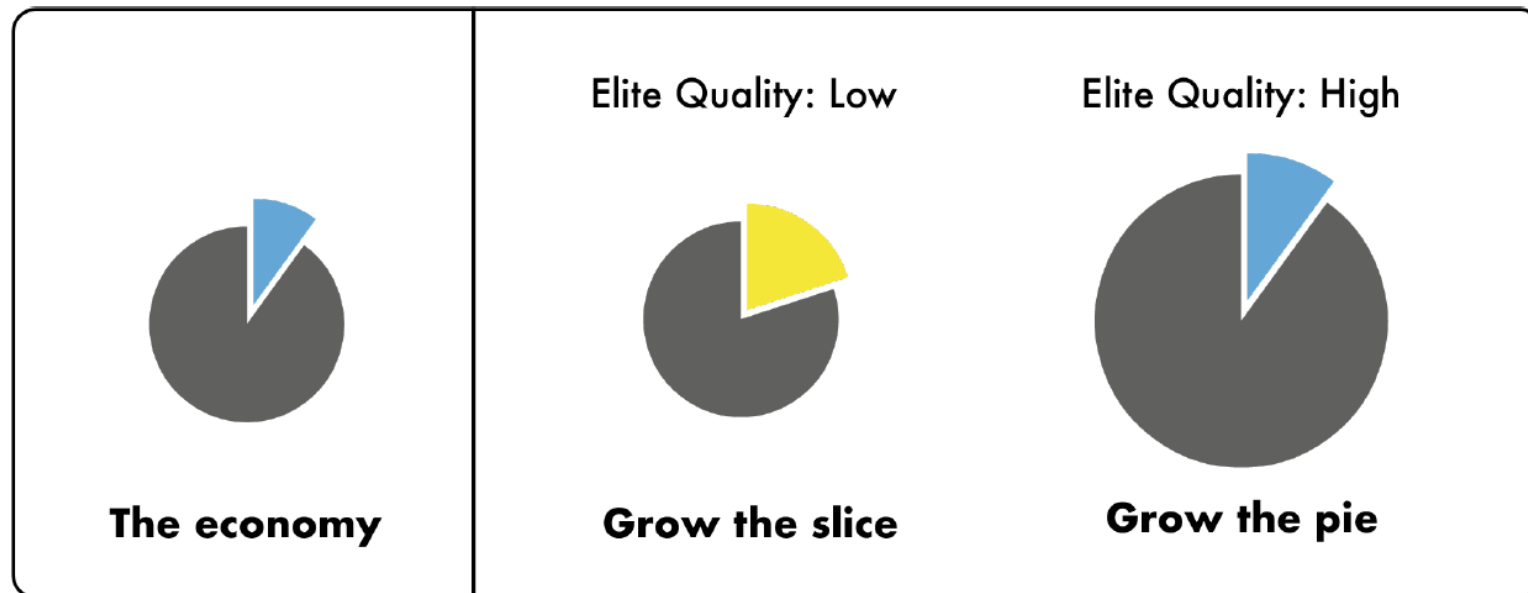
Ranking of corruption perception index CPI, Transparency International, 2010-2021



Sample of data from 'Citizens' Views and Experiences of Corruption', Transparency International, 2021, %



High quality elites enlarge “the pie”



production
 specialization
 exchange
 productivity enhancements
 incremental innovation
 radical innovation human
 capital development
 value co-creation



exchange restrictions
 regulations, licensing
 discrimination
 corruption
 taxes and subsidies
 monopolies and cartels
 litigation
 environmental destruction
 criminal activity



Óscar Afonso, Expresso, 2021-05-19:

*.... No desenvolvimento das suas atividades as elites exploram modelos de negócio para a acumulação de riqueza. Assim, **elites de elevada qualidade seguem modelos Criadores de Valor que dão à sociedade mais do que dela retiram (desenvolvem atividades produtivas potenciadoras de riqueza). Nesse processo, aumentam também a sua riqueza individual. É um win-win game em que todos ganham.***

*Pelo contrário e no outro extremo, **elites de baixa qualidade, desenvolvem modelos de extração de valor baseados na transferência de valor de um subconjunto da sociedade para outro (o que na terminologia anglo-saxónica se designa por rent-seeking).** Estão comprometidas em fazer aumentar a sua riqueza individual à custa de valor criado por outros, apropriando-se de mais valor do que aquele que criam para a sociedade. Isto acontece em modelos de negócio baseados em monopólios, em tarifas aduaneiras protecionistas ou em modelos subsídio-dependentes. Estas situações representam verdadeiros entraves ao progresso das sociedades. ...*