



**MINISTRY OF HIGHER EDUCATION,
SCIENCE, AND TECHNOLOGY**

FUTURE SKILLS FOR ACCELERATING STRONG AND SUSTAINABLE GROWTH

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Economic Growth Depends on Science and Technology

Indonesia's Capital

- Rich natural resources
- Large Population

Growth

- Food security
- Energy security
- Downstreaming



Indonesia's Downstreaming Strategic Priorities



Source: The Ministry of Investment and Downstream Industry

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**HUMANS do research,
producing Scientific and Technological
outputs**

Indonesia's Underdeveloped Human Capital: HCI

Indonesia's Human Capital Index HCI: rank **#96** out of 175 countries



- With optimum health, a child born in Indonesia is predicted to achieve only 54% of their potential productivity
- Indonesia's HCI is below the average of East Asia and Pacific (0.59) and Upper-middle Income Countries (0.56)
- Well below the HCI of neighboring countries: Vietnam (**0.69**), Malaysia (**0.61**), and Thailand (**0.61**)
- Expected Years of Schooling is **12.4 years** with Learning-Adjusted Years of Schooling of only **7,8 years**

Indicator	Indonesia	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	North America	South Asia	Sub-Saharan Africa
	Male + Female	Male + Female	Male + Female	Male + Female	Male + Female	Male + Female	Male + Female	Male + Female
HCI Component 1: Survival								
Probability of Survival to Age 5	0.975	0.978	0.993	0.982	0.984	0.994	0.962	0.934
HCI Component 2: School								
Expected Years of School	12.4	11.9	13.1	12.1	11.6	13.3	10.8	8.3
Harmonized Test Scores	395	432	479	405	407	523	374	374
HCI Component 3: Health								
Survival Rate from Age 15 to 60	0.850	0.864	0.904	0.862	0.912	0.915	0.841	0.735
Fraction of Children Under 5 Not Stunted	0.723	0.750	0.903	0.852	0.823		0.602	0.688
Human Capital Index (HCI) 2020	0.54	0.59	0.69	0.56	0.57	0.75	0.48	0.40

Source: World Bank

Indonesia's Underdeveloped Human Capital: Global Innovation Index



	Overall GII	Institutions	Human capital and research	Infrastructure	Market sophistication	Business sophistication	Knowledge and technology outputs	Creative outputs
Malaysia	33	27	38	52	18	36	35	49
Thailand	41	74	71	50	25	41	39	38
Vietnam	44	58	73	56	43	46	44	34
Indonesia	54	40	90	67	35	78	73	65

Strengths



Market sophistication



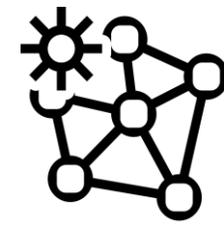
Institution



Human capital and research



Business sophistication



Knowledge and technology outputs

Weaknesses

Source: World Intellectual Property Organization, 2024



Dissecting Indonesia's Global Innovation Index



Rank	Code	Indicator name
126	6.1.4	Scientific and technical articles/bn PPP\$ GDP
121	5.2.1	Public Research-Industry co-publications, %
115	2.1.1	Expenditure on education, % GDP
83	5.1.3	GERD performed by business, % GDP

Human capital and research: expenditure on education, school life expectancy, graduates in science and engineering, gross expenditure on R&D

Business sophistication: knowledge workers, innovation linkages, knowledge absorption

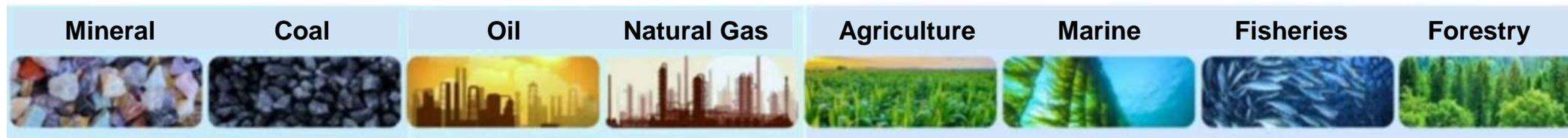
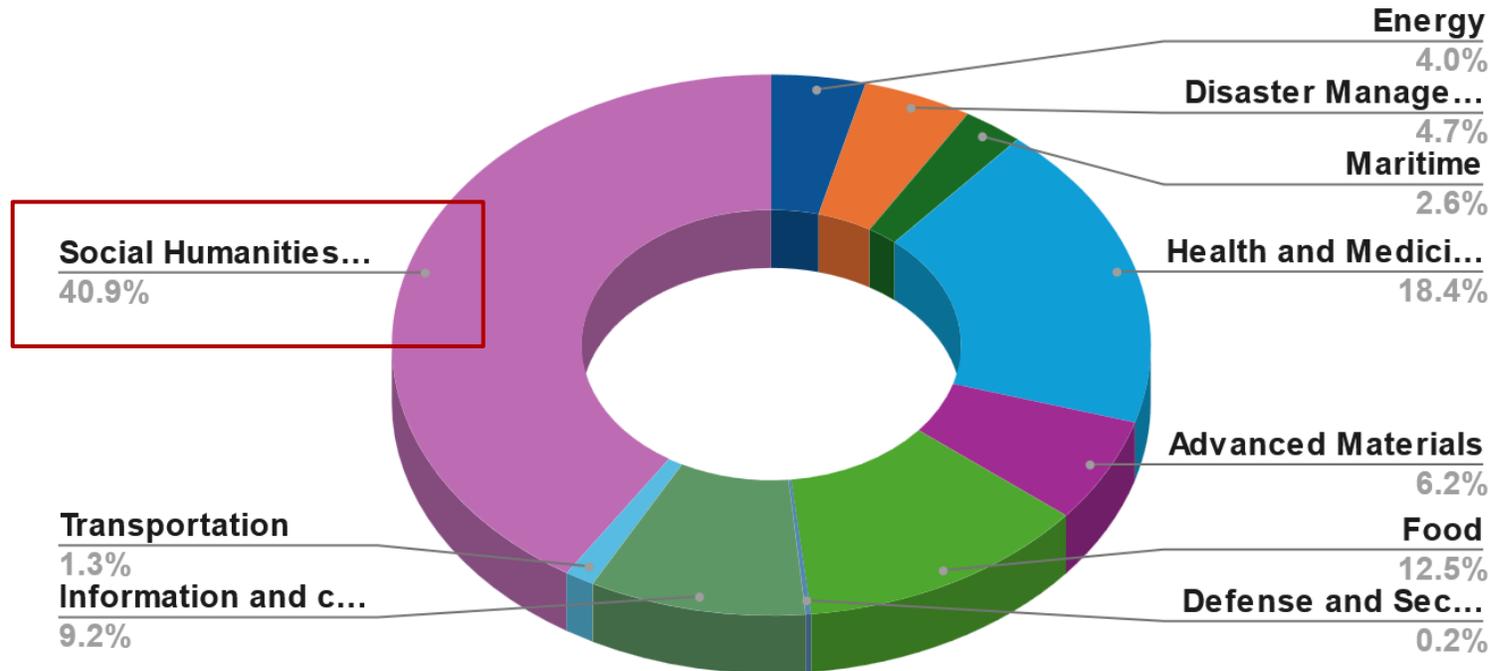
Knowledge and technology outputs: knowledge creation, knowledge impact, knowledge diffusion

Source: World Intellectual Property Organization, 2024



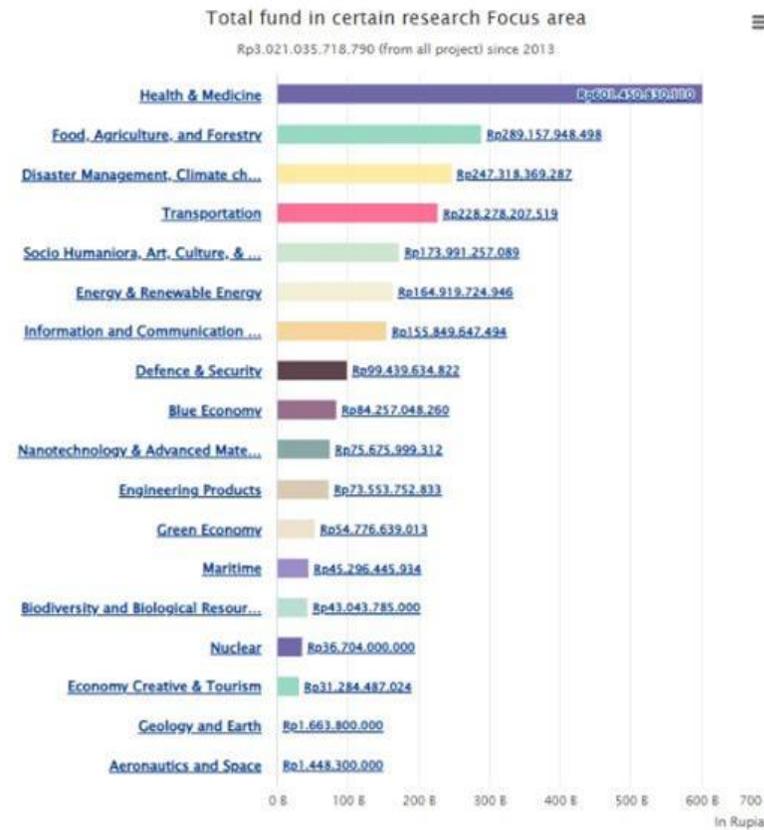
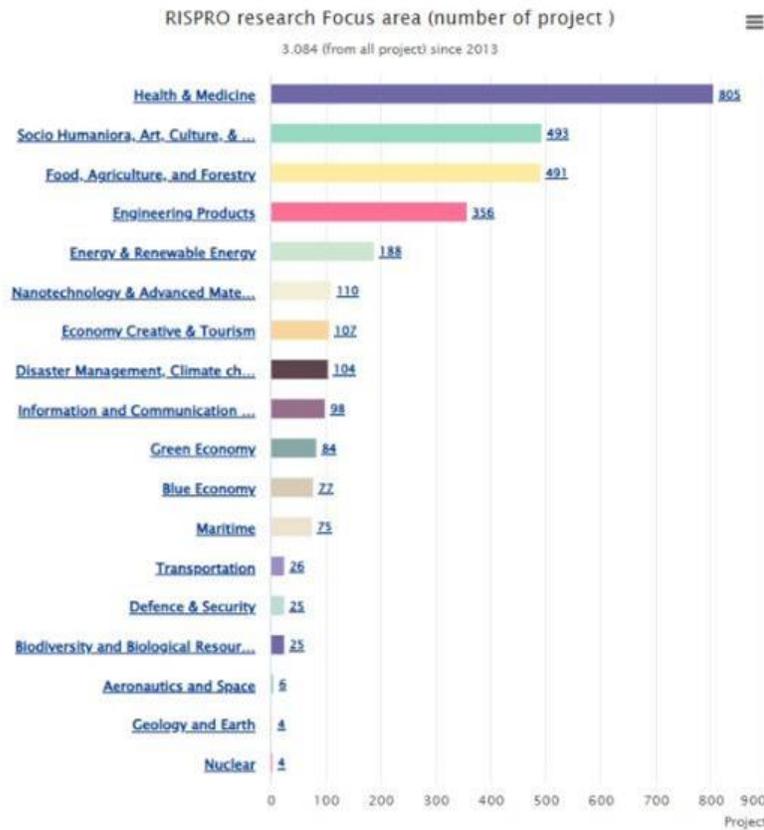
Suboptimal Research Distribution by Focus Field

Number of Research by Field

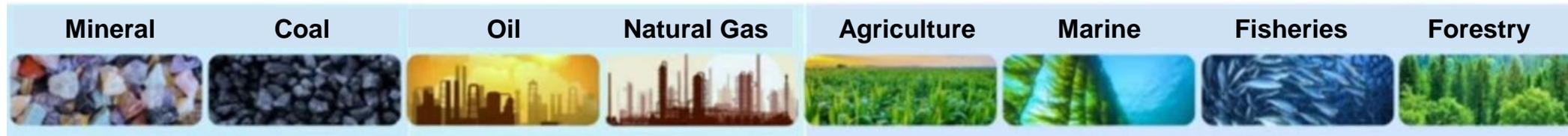


Source: Ministry of Education, Culture, Research, and Technology (2023)

Suboptimal Research Distribution by Focus Field: LPDP

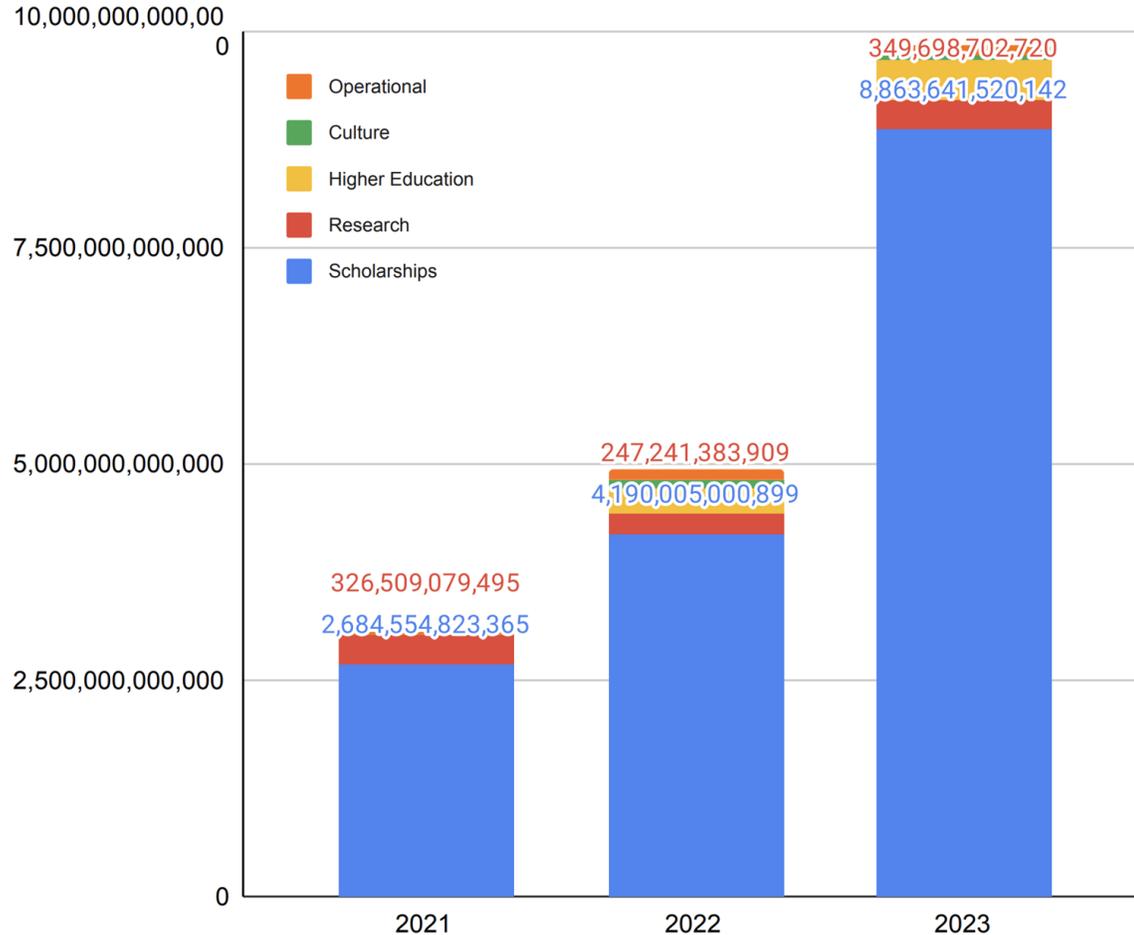


Aligning research activities with national strategic priorities is crucial to drive meaningful innovation and support sustainable growth



Source: Indonesia Endowment Fund for Education Agency, 2024

Need Greater Investment in Research: Funding allocation by LPDP



Funding scholarships **create** better human capital in terms of knowledge and skills.

But funding research is necessary to effectively **absorb** this high-skilled workforce

Source: Indonesia Endowment Fund for Education Agency



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Humans do research within an ECOSYSTEM

Ecosystem of research must be ROOTED in UNIVERSITIES



BEST PRACTICE

- All the most successful countries do it this way
- Clusters of innovation always start with universities: Eg., Stanford-Silicon Valley, Tsinghua-Zhongguancun (Silicon Valley of China), Tel Aviv University/Weizmann Institute-Israel innovation cluster

WHY?

- Constant inflow of young people into research.
- Research in universities directly trains new generations of researchers and innovators (efficiency - same input has research and educational outcome)
- Space for bottom-up research initiatives from professors and young people.
- Competition begets quality. When research is done at many universities instead of one centralized institution, you naturally get competition that begets quality.



Universities are not incentivized to do research



KPI-PTN is a new performance measurement tool for Higher Education Institutions which is assessed based on 8 Performance Indicators. Several IKU-PTN are considered less supportive of the research ecosystem in Indonesia.

KPI 1 **Graduates get decent jobs**

KPI 2 **Students get experience off-campus**

KPI 3 **Lecturers do activities off-campus**

KPI 4 **Practitioners teaching on-campus**

KPI 5 **Lecturers work results are used by the community or receive international recognition**

KPI 6 **Study programs collaborate with world-class partners**

KPI 7 **Collaborative and participatory classes**

KPI 8 **International standard study programs**



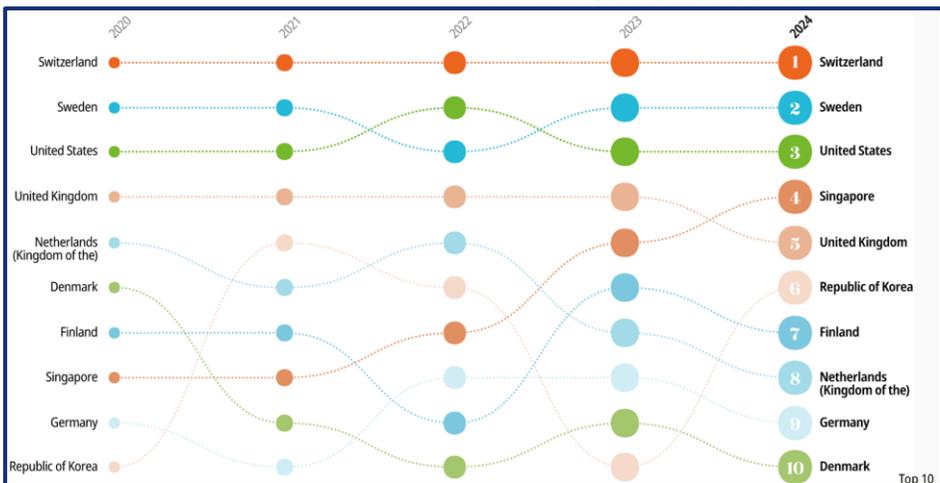
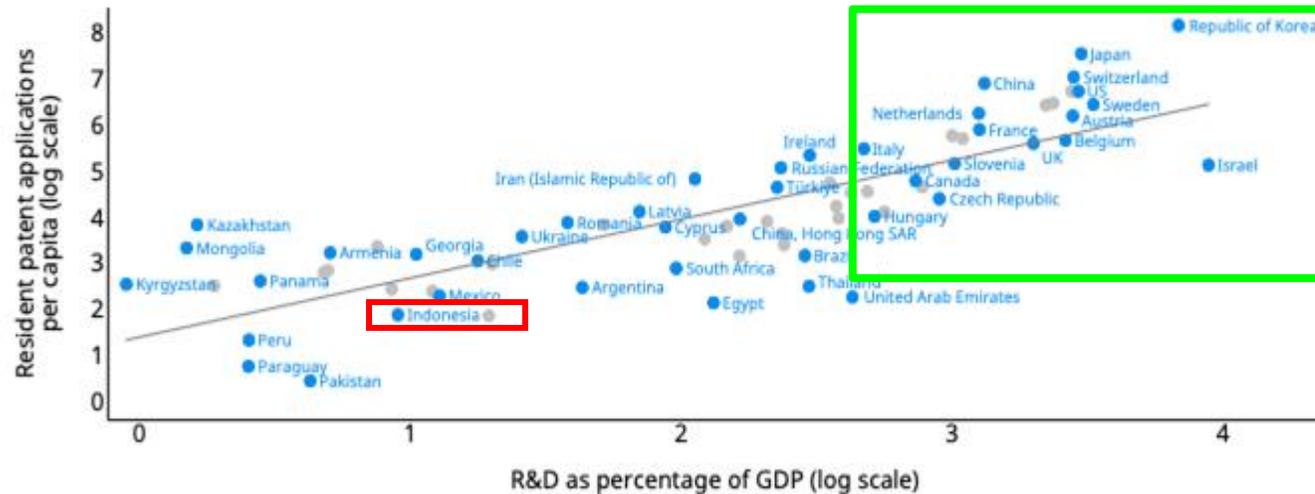
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How to create ecosystems that support human producing science & technology?

Reframing our mindset: Innovation-led vs Investment-led



A40. Resident patent applications per capita and R&D expenditure per capita, 2018–2022



Countries with higher spending R&D as percentage of GDP tend to dominate the Global Innovation Index and have higher resident patents per capita

Spending on research and development IS a form of investment

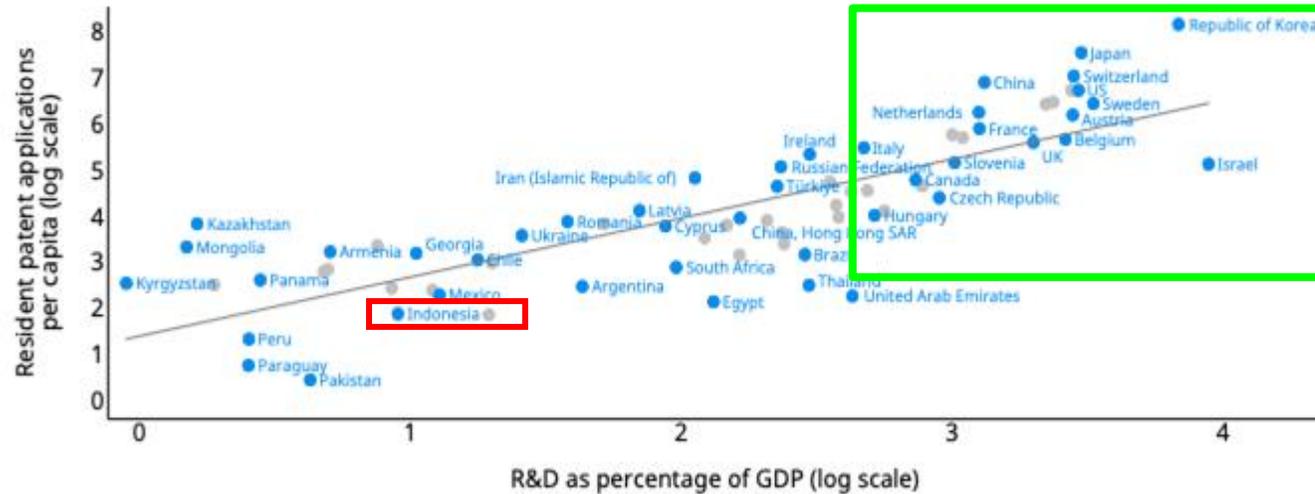
Source: World Intellectual Property Organization, 2023



Reframing our mindset: Innovation-led *and* Investment-led

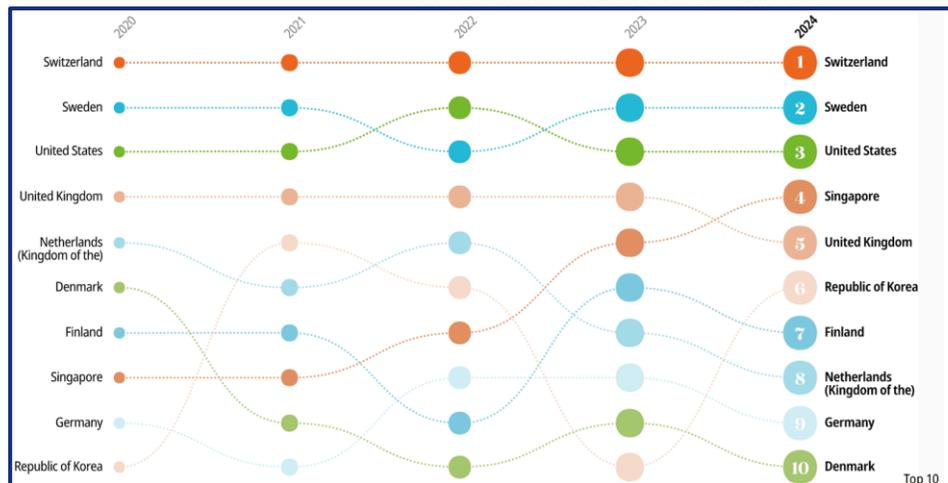


A40. Resident patent applications per capita and R&D expenditure per capita, 2018–2022



A paradigm for growth that includes homegrown innovations:

- Technology and know-how from external partners is necessary.
- But we must start to innovate our way into HOME-GROWN technologies and know-how.
- Plain imitation and import of technology is not a long term solution because:
 - it is not efficient
 - you always get obsolete and/or less productive technologies
 - it creates a dependence



Source: World Intellectual Property Organization, 2023





RESEARCH IS INVESTMENT

RESEARCH IS NOT SUNK COST





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SUGGESTIONS

- When evaluating research expenditures, ministries should always include a column for the growth and benefits generated by the research**
- Universities should do impact studies on the research they do to supply the relevant growth data**

Incentives to Drive Industry Investment in Research



Give incentives to the **INDIVIDUALS** doing research, i.e. university faculty (dosen peneliti)

- Financial incentives: a proportion of research grant given directly to the individual researcher
- Non-financial incentives: reduce bureaucracy

Give incentives to the **ECOSYSTEM** that supports these individuals to do research:

- Universities: When a faculty gets a grant, a proportion of it is given to the university as “overhead”
- Industry and outside donors: Tax incentives for R&D investment and donations.



Fiscal Incentives to Drive Industry Investment in Research



 Insentif fiskal lebih kompetitif & transparan, diajukan melalui sistem OSS*

Tax Holiday (PP 12 /2020, PMK 130/PMK.010/2020, PerBKPM 7/2020)	Tax Allowance (PP 78/2019, PMK 96/PMK.010/2020, PerMenperin 47/2019)
<p>100% Pengurangan PPh Badan 100% dengan nilai investasi \geq Rp 500 miliar selama 5-20 tahun. 50% tambahan pengurangan PPh Badan untuk 2 tahun. Diberikan kepada bidang usaha yang masuk ke dalam 18 kelompok industri pionir dengan 185 cakupan produk.</p>	<p>30% Pengurangan penghasilan neto objek pajak sebesar 30% dari jumlah nilai penanaman modal aset tetap selama 6 tahun (5% per tahun) untuk investasi di 166 bidang usaha dan 17 bidang usaha di daerah tertentu.</p> <p>Penyusutan yang dipercepat atas aktiva tetap berwujud dan</p>
<p>50%</p>	<p>dak lebih</p>
<p>Overly complex <u>bureaucracy</u> prevents industries from investing</p>	
Pembebasan	
<p> Pembebasan bea masuk untuk mesin/peralatan dan barang dan bahan (barang modal).</p> <ul style="list-style-type: none"> • 2 tahun pembebasan bea masuk atas impor mesin atau mesin impor yang dibeli di DN; • 2 (+1) tahun pembebasan bea masuk atas impor barang dan bahan sesuai kapasitas terpasang, atau melakukan penambahan kapasitas min. 30%; atau • 4 (+1) tahun pembebasan bea masuk atas impor barang dan bahan sesuai kapasitas terpasang, apabila menggunakan min 30% mesin produksi DN. 	<p>300% Pengurangan penghasilan bruto paling tinggi 300% dari jumlah biaya yang dikeluarkan untuk kegiatan Litbang.</p> <p>200% Pengurangan penghasilan bruto paling tinggi 200% dari jumlah biaya yang dikeluarkan untuk kegiatan Diklat.</p> <p>60% Pengurangan Penghasilan neto sebesar 60 persen dari total nilai investasi selama 6 tahun, yang dibebankan 10 persen per tahun, untuk 45 industri padat karya yang menyerap min. 300 TKI.</p>

*) OSS: Online Single Submission.



Summary



ECONOMIC POLICY CREATES THE CONDITIONS FOR SCIENCE AND TECHNOLOGY DEVELOPMENT

BY INCENTIVIZING INDIVIDUALS and ECOSYSTEM of UNIVERSITIES AND INDUSTRY PARTNERS

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- Large Population

Science and Technology

Growth

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