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Who is Going to Win the AI Race.....Safely? A Composite Index Measuring National Strategies to AI Innovation and Regulation

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Introduction:

Artificial Intelligence (AI) has become ubiquitous with everyday life. Whether it is used in school, work, or as a search engine to answer a simple question, Chatbots and other AI products have become commonplace. The resources and capital expended to develop these cutting-edge technologies exceed billions of euros and trace back to Alan Turing and the Turing Test of the 1950s. The AI landscape was redefined by the release of Open AI's chat bot, "Chat-GPT 3.5". Since the it's release in November of 2022, immense amount of resources and capital have been put towards the development of AI as access to the hyper-capable technology becomes near-universal.

The risks and adverse effects of the widespread adoption include energy concerns, psychological concerns, and general misuse for nefarious activities. Countries are attempting to mitigate these adverse effects through legislation, guidelines, and controlled sandboxes. Other countries however are prioritizing the economic gains of leading in development and adoption, placing little to no guardrails on the emerging technology, and putting immense amounts of capital in private and public initiatives. This research project aims to explore whether pursuing innovation to reap the economic benefits as well as mitigation of the adverse effects through regulations and other means is possible? In essence, striking a balance between regulation and innovative development of AI.

Methodology:

To compare over 50 countries' AI innovation and regulation a composite index was adopted. A composite index is a statistical tool that summarizes many metrics into a singular number to easily assess a complex phenomenon. To discern what metrics to measure sources such as the OECD's A.I. Policy Observatory, the World Bank, the European Commission, as well as private firm's advice on national strategies were surveyed.

Each category of the innovation index was weighted proportionally to the contribution it made to development. The regulation categories were weighed evenly. Each economic figure was adjusted proportionally to the respective countries' economy size. The most challenging part of the project was compiling and assessing a countries regulations and innovation efforts into a singular index. The benefit and also downside of a composite index is that it takes complex phenomenon's and presents it in a singular statistic.

Measuring Innovation:

Many different factors can be measured and contribute to a country's rate of innovation or technological output. This study focused on a few key areas relating to investment (public and private), national infrastructure, and human capital in each country. These measurable categories included;

- **% of country with digital access**
- **% of population with college degrees**
- **national AI adoption strategies**
- **amount invested in data centers**
- **public, private, or public private partnerships investing in AI**
- **Venture Capital Funding for Technology Startups**

These metrics were identified in research and advice from the OECD, technology companies, and policy think tanks providing empirical data to quantify the level of innovation within a country.

The data analyzed for the innovation index was mostly quantitative including investment amounts, economic data points, and civil figures like educational attainment and infrastructure.

Measuring Regulation:

Attempting to regulate any new technology can be challenging and force regulators to make decisions based on imperfect information or without knowing the full impact of new technology. AI is no different, with many approaches being adopted. An array of research has produced many ways in which AI can be regulated. Current AI regulations comprise of 4 categories;

- **Banned use cases:** the application of AI for uses that carry to much risk.
- **Risk Based Approaches:** Categorizing and applying appropriate regulations.
- **Human Oversight:** Requirements on AI produced content and functions.
- **Transparency:** Reporting what data a model is trained on

Policy thinktanks, like the OECD AI Principles and Policy Observatory, produce information on best practices to protect human rights and democracy.

The data analyzed under the regulatory portion of the index was more qualitative as the study looked at countries' legislation and guidelines.

Results:

European Countries, while heavily critiqued for their overbearing regulations, has made a strong turnaround through the EU's guidelines, action plan, and investments while also engaging more with the private sector which has moved them forward. The **USA** remains a clear front runner when it comes to innovation due to being host to many top companies and AI labs as well as the largest AI investment. , however, lacks in regulation and safety. **Japan** and other **Asian countries** are strong contenders due to their manufacturing capabilities, leading technology firms and research labs, high levels of social cohesion, and prioritization of education.

Leaderboard:

Countries:	Innovation:	Regulation:	Total:
1. France	38/50	43/50	81/100
2. Ireland	33/50	43/50	76/100
3. South Korea	37/50	38/50	75/100
4. United States of America	45/50	28/50	73/100
5. Japan	32/50	37/50	69/100

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Literature cited:

CEPR, the Center for Data Innovation, Google, the European Commission, various National AI Development Plans, the OECD AI Principles, the OECD.AI Policy Observatory, Open AI, the United Nations Human Development Index, and the Wilson Center