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GLOBAL PATTERNS IN INNOVATION AND THEIR IMPLICATIONS FOR DEVELOPING ECONOMIES: A CASE FOR SRI LANKA

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ABSTRACT

This study examines Sri Lanka's performance in the Global Innovation Index (GII), focusing on identifying crucial factors of innovation outcomes and the impact of data integrity on its rankings. Despite fluctuating between 98th and 101st positions from 2013 to 2022, and ranking 89th in 2024, Sri Lanka's innovation ecosystem faces challenges due to economic crises and limited fiscal resources, emphasizing the need for private sector-led growth. The paper carries out a fixed effects panel regression to test the effects of sub-pillars and indicators of knowledge and technology outputs and creative outputs pillars that mostly affect the GII rankings. Results highlight that knowledge impact and intangible assets as the important sub pillars as well as labor productivity, high-tech manufacturing and trademark registrations as indicators. In addition, the study indicates that missing information and outdated data have a strong influence in GII ranking. The paper has recommended policy suggestions involving increasing the labor efficiency with industrial training, stimulating high technology industries through foreign investment and rectifying intellectual property mechanisms to augment innovative products. It is also important to increase data integrity and coordination between agencies at the national level so that they capture the real innovation capacity of Sri Lanka. The study's novelty lies in its strong emphasis on data integrity and cross-country benchmarking among developing economies. Policy implications extend beyond Sri Lanka, offering a framework that other lower-middle-income nations can adapt to strengthen innovation ecosystems and improve global competitiveness.

Keywords: Data Integrity, Global Innovation Index, Innovation Policy, Knowledge Economy

1. Introduction

An innovation is a process of bringing new ideas or existing concepts into life by improving them and commercializing them for business success (Mohr, 2006). To determine and boost this kind of innovation, particularly in developing economies such as Sri Lanka, measurement instruments should be powerful to determine the existing strengths, gaps, and policy priorities (Dutta et al., 2020). The innovative performance and the innovative competitiveness of the economies have been captured by many indices that have been used. They are the Global Competitiveness Index (GCI) that puts more emphasis on the competitiveness of a national economy in promoting a long term economic growth (Schwab, 2019), the Knowledge Economy Index (KEI) which is an indicator that measures how developed a country is in terms of the advancement to a knowledge-based economy (Chen & Dahlman, 2006) , the European Innovation Scoreboard (EIS) that is an index that gives a comparison analysis of research and innovation in performance of the EU Member States (Reid & Markianidou, 2024) and the OECD STI Scoreboard which measures science and technology performance focusing on areas such as R&D and patent data (OECD, 2013). Among all such innovation indexes, the Global Innovation Index (GII) is commonly seen to be an overall measure of the innovation potential in nations since the index quantifies a significant number of factors beyond the established measures and is commonly acknowledged to serve as a benchmarking instrument to governments, stakeholders, and businesses (Pennings, 2018).

Introduced in 2007, the Global Innovation Index (GII) is a tool used for measuring the innovation capacity of the countries on a global scale and is used as a benchmark for the policy creation, critical investment decisions by governments, investors and researchers (WIPO, 2020). The Global Innovation Index covers over 142 countries from all income categories and combines quantitative data such as gross expenditure on R&D and qualitative information like regulatory quality. The consistent publication of the index starting from 2011 covering all economies helps identify the gaps and trends in innovation performance in different economies. The alignment with broader development goals such as education, ICT access and knowledge absorption makes this a useful tool for data driven policy formulation and evaluation (WIPO, 2017).

Sri Lanka's performance has been subpar; Sri Lanka's global innovation index ranking has fluctuated throughout the years 2013 - 2022 between 98th and 101st position. The latest ranking for the year 2024 is 89th out of 142 countries. One major factor for the fluctuation of the ranking is the numerous economic crises faced over the past decades which resulted in high inflation, currency depreciation, foreign exchange shortages, and

rising debt levels, the latest being the crisis triggered by the pandemic and government instability. Among the other reasons, these crises have contributed to the depletion of funds reserved for R&D, education, and infrastructure factors that are crucial for economic growth (Aturupane, 2019). However, in the current context of limited fiscal space, the country can no longer reply on state led growth, bringing the importance of innovation and private sector led growth to the forefront. While the improvement of the innovative climate is crucial for simulating sustainable economic growth, the improvement in GII rankings alone provides a strong positive signal to investors (Che Hassan et al., 2023).

As such, this study focuses on how Sri Lanka can strengthen its position in the global knowledge economy by improving its GII rankings. Specifically, this study aims to utilize the detailed panel dataset of the GII to identify the pillars, sub-pillars and indicators that contribute most to improvements in GII rankings. As a secondary objective, the paper also studies the impact of data integrity and reporting lapses on innovation rankings. The findings indicate that the most influential sub-pillars that promote GII rankings are knowledge impact and intangible assets pillar, and the lack of missing data and outdated data considerably misrepresents the innovation performance of Sri Lanka. These results are used to develop evidence-based policy recommendations that Sri Lanka can adopt to improve the current rankings.

The rest of the paper is structured as follows: the next section provides an overview of the literature, and the following section presents the methodology including some methodological details of the GII. This is followed by the results and discussion. The final section concludes.

2. Literature Review

Innovation is a primary driver of economic growth and societal advancement, shaping economies and societies across diverse global contexts. Economic growth is primarily fueled by innovation, and its contribution to the economy is emphasized in literature. For instance, it has been suggested that innovation fueled the GDP growth of the BRICS nations (WIPO, 2024) and that innovation plays a significant role in maintaining economic stability during global economic disruptions (Vasin & Timokhina, 2024). As stated in the studies above, innovation has powered the gross domestic products of the countries while contributing positively to economic stability and growth. In developing countries, innovation is a primary factor of economic growth as it enhances productivity and creates job opportunities through emerging industries and services (Rajput et al., 2021). Innovation behaves as a

catalyst for sustainable use of resources and enhances the resilience against economic shocks which is crucial for the developing economies (UNCTAD, 2018). Developing countries can address long term structural economic obstacles through digital transformation in education & health sectors, reducing brain drain and updating ICT infrastructure (World Bank, 2021). Furthermore, innovation transcends various technological advancements, influencing governance through data-driven policies and fueling entrepreneurship via startup ecosystems and business model innovation (Nave et al., 2024). While innovation has been historically linked to developed economies such as the United States of America and Europe, which have been identified as the top performing regions in innovation performance, it has fueled the rapid growth of many developing countries as well (Vukoszavlyev, 2019; WIPO, 2024). These contributions underscore innovation's role as a cornerstone of economic stability and societal advancement, fostering sustainable development and resilience across both developed and developing economies.

Several factors shape a country's innovation capacity beyond specific frameworks like the GII. Human capital as one of the key factors which influence the innovation of a country is backed by components like individualism, indulgence and flexible work culture. Alas et al. (2012) in the journal 'Organizational Studies' have stated that collaborative culture and employee engagement are pivotal for the innovation climate to be established within the organization. Human capital, encompassing education, skills development, and workforce engagement, is a primary determinant, as it enables the creation and adoption of new ideas (Alas et al., 2012). As a result of the rising demand of the consumers, competition in the market has increased and innovation has emerged as the key element in stabilising the dynamic nature of the marketplace through developing unique services and products and commanding the market share that leads to attaining sustainable growth. Innovation is promoted by the competitiveness of the market and the consumer demand as businesses are stimulated to produce their products and services to distinguish themselves (Agazu & Kero, 2024). Government policies should be flexible and consistent to stimulate innovation because providing conditions of investment and partnership makes the environment innovation-friendly (Hashim Osman et al., 2011). Investment into research and development (R&D) also serves as a critical factor, as it allows technological improvements and discovering new knowledge (Savrul & Incekara, 2015). These aspects, encompassing human capital, organization culture and the dynamics of the market, are all drivers of innovation, and their effect differs depending on precise economic and cultural settings.

The Global Innovation Index (GII) provides a comprehensive framework to assess innovation performance globally and has been the focus of numerous studies attempting to comprehend the key drivers of innovation using GII data. Human capital and business sophistication emerged as key drivers of innovation in several studies, while infrastructure and institutions showed limited impact using multivariate analysis, comparative analysis and fixed effect regression (Luiz, 2023; Nasir & Zhang, 2024). Even though pillars such as human capital and business sophistication are essential for enhancing innovation performance, there is a visible diversity of impact across different regions and economies (Crespo & Crespo, 2016). Regardless of the importance of core innovation pillars, their impact on innovation performance has fluctuated among the income groups and across different regions. Bate et al. (2023) conducted a cross-country analysis to check the income disparities and their impact on the country's innovation capacity. They suggest that when creating policies, the authorities should consider addressing specific determinants that impede innovation to reduce long term effect on the economy. Countries that are not the members of the European Union who are most commonly known as 'Western Balkan' countries have been assessed through a Multi Criteria Decision Analysis (MCDA) to analyze the GII data for the years 2019,2020 & 2021 and have obtained that Montenegro had best results in 2019 and 2020 while 2021 year innovation indicators were occupied by Serbia (Stojanović et al., 2022). Maria and Au-Yong-Oliveira (2023) found that human capital and business sophistication drive GII performance, with Portugal lagging peers like Ireland due to weaker business sophistication and environmental sustainability, suggesting tailored policies to enhance innovation. These studies highlight the critical role of human capital and business sophistication, while also revealing regional and income-based variations in pillar impacts.

While prior studies have extensively analyzed GII pillars such as human capital and business sophistication to explain innovation rankings, most focus on high-income countries, with limited attention given to benchmarking strategies for improving the GII performance of smaller developing nations such as Sri Lanka (Dutta et al., 2020). To date, no comprehensive study has attempted to analyze how countries with similar economic profiles have enhanced their innovation index rankings and how such strategies could be adapted to Sri Lanka. Additionally, this study uniquely investigates the impact of missing and outdated data on GII rankings, revealing their significant negative effect on a country's innovation assessment. By applying these findings to Sri Lanka, a developing country with fluctuating GII rankings (98th to 101st

between 2013–2022, and 89th in 2024), this research seeks to fill these gaps by analyzing successful practices from comparable countries and identifying key levers through indicator analysis within output pillars. This study focuses on benchmarking strategies and data integrity, combined with tailored, evidence-based policy recommendations, distinguishes this study from existing GII literature, offering actionable insights to enhance Sri Lanka's innovation ecosystem.

3. Methodology

3.1. Background on the GII

This Global Innovation Index is structured around seven main pillars, five of which are considered inputs into the innovation climate and two of which are considered innovation outputs. Institutions, human capital and research, infrastructure, market sophistication and business sophistication, comprise the former category, while knowledge and technology outputs and creative outputs comprise the latter (WIPO, 2022).

The computation of the Global Innovation Index (GII) aggregates scores for each of the seven main pillars, collectively built on approximately 80 underlying indicators. Each main pillar is broken down into several sub-pillars, for which scores are first computed by aggregating the performance across their respective indicators. The score for each main pillar is then calculated as the average of its sub-pillar scores. This methodology is applied consistently across all seven pillars. Once the main pillar scores are computed, they are combined to generate an overall GII score for each country, which subsequently determines its position in the global innovation ranking. The indicators included in the GII are subject to periodic revision, with the most recent adjustment taking place in 2022.[1]

Regarding data treatment, missing values are not imputed. They are marked as "n/a" and excluded from sub-pillar scores. This approach enhances transparency and avoids bias from estimation. The Global

[1] For instance, several indicators, such as ease of starting a business, ease of resolving insolvency were removed, while new indicators such as policies for doing business, entrepreneurship policies and culture and venture capital received (% of GDP) were introduced to better reflect modern innovation environments.

Innovation Index (GII) uses data from different years depending on when each indicator was last available. This means some data may be outdated, and the reference years can vary between countries and indicators. As a result, year-to-year changes in GII rankings may not always reflect actual changes in innovative performance but could be influenced by older data. This makes it important to interpret GII results carefully and consider additional country-specific analysis (WIPO, 2022).

For this research, we used secondary data on the Global Innovation Index obtained from the Mendeley Data website (Brás, 2022). This dataset spans 10 years (2013-2022) and contains observations from 133 countries. The dataset includes scores and rankings for the seven major pillars and their respective sub-pillars.

We start by aiming to identify which pillars have the most significant contribution to the overall global innovation index rankings based on an inter-temporal, cross-country comparison. In a previous paper (Wijendra et al., unpublished), we conducted a panel regression over the period of 12 years 2011- 2022 and showed that while all the seven core pillars have a significant impact on the GII rankings the “Knowledge and Technology Outputs” and “Creative Outputs” pillars consistently demonstrated the strongest influence on overall rankings. Accordingly, we begin our analysis by studying the contribution of different sub-pillars and indicators towards the rankings in these two pillars.

First, to assess which sub-pillars strongly influence each of the two main pillars we conducted panel regression analyses using fixed effects (FE) regressions for each pillar using their respective sub-pillar rankings. The fixed effects model was chosen to control for unobserved, time-invariant country-specific factors that may be correlated with the explanatory variables.

The panel regression model can be expressed as follows:

$$\Delta Y_{it} = \beta_0 + \beta_1 \Delta X_{it} + \varepsilon_{it} \quad (1)$$

where ΔY_{it} is the change in the main pillar ranking in country *i* at time *t*, ΔX_{it} is the matrix of changes in rankings for the sub-pillars belonging to the main pillar and ϵ_{it} is the error term. To investigate which indicators, influence sub-pillar rankings the most, we follow the same strategy of applying a panel regression of changes in sub-pillar rankings on corresponding indicator rankings. Finally, to assess the influence of missing data and outdated data on innovation performance, we employed the multiple linear regression model as specified in Equation 2.

$Y_i = \beta_0 + \beta_1 NumMissing_i + \beta_2 NumOutdated_i + \varepsilon_i$…….. (2)
where *Y* represents the observed GII ranking or score for country *i*, while *NumMissing* and *NumOutdated* denote the number of missing and outdated indicators, respectively. If the economy's data is older than the base year the data is considered as outdated data (WIPO, 2022). The estimation is carried out using data for the latest available year in the dataset, 2022. This approach enables the identification of systematic reductions in innovation performance, attributed to the presence of incomplete and outdated data sources.

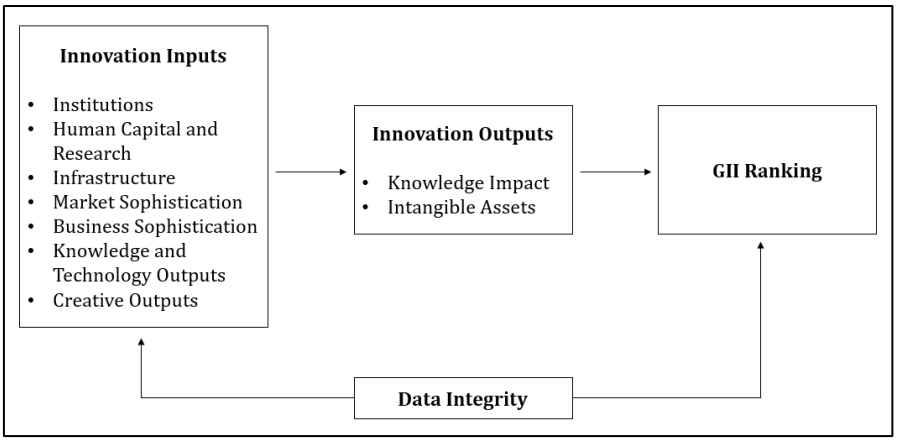

Figure 1: Conceptual Framework Showing Relationships among Innovation Inputs, Outputs, and GII Ranking

4. Results and Discussion

We begin our analysis by investigating how each sub-pillar within the knowledge and technology outputs and creative outputs pillars contributes to their overall performance. This method assists in finding which of the sub-pillars drive the innovation performance of the two pillars so that they can be prioritized when creating innovation policies. The two output pillars of the GII, knowledge and technology outputs (KTO) and creative outputs (CO) capture the measurable results of innovative activities within an economy. The KTO pillar comprises of the knowledge creation sub-pillar (which includes indicators such as patents, scientific publications, and utility models that reflect inventive output), knowledge impact (measured by productivity growth, new firm creation, and the presence of high-tech manufacturing), and knowledge diffusion (measured by high-tech export value, intellectual property receipts, and ICT service exports). The CO pillar comprises of intangible assets (which is measured by brand value, trademark filings, and industrial designs), creative goods and services (the production and

export of cultural goods, media content, and related services) and online creativity (measured by domain registrations, Wikipedia edits, and mobile app development) sub-pillars.

The estimated results from comparing the contributions of sub-pillars on main pillar rankings are presented in Table 1.

Table 1: Estimated Effects of Sub-Pillar Rankings on Main Pillar Performance (2013–2022)

Main Pillar	Sub pillars	Coefficient	Standard error	N	R square
Knowledge and technology outputs	Knowledge creation	0.271***	0.031	1033	0.699
	Knowledge impact	0.413 ***	0.013		
	Knowledge diffusion	0.318 ***	0.011		
Creative outputs	Intangible assets	0.489 ***	0.010	1021	0.776
	Creative goods and services	0.282 ***	0.011		
	Online creativity	0.246 ***	0.018		

Note: The asterisk in this table shows the significant sub-pillars.

Although all sub-pillars were found to have a statistically significant impact on the rankings obtained in the main pillar, this significance alone did not allow for clear identification of which sub-pillar contributed most strongly to the main pillar ranking.[2] As such, a linear hypothesis test (Wald test) was employed to compare the coefficients of each pair of sub pillars. The results are summarized in Table 2.

Table 2: Wald Test Results for Sub-Pillars

Comparison	Chi-squared	P-value
Knowledge creation vs Knowledge Impact	17.050	0.000***
Knowledge creation vs Knowledge diffusion	1.974	0.160
Knowledge impact vs Knowledge diffusion	33.387	0.000***

[2] Note that since all data is on rankings rather than differing measures, we can make statistical comparisons between coefficients estimated for different sub-pillars.

Intangible assets vs Creative goods and services	175.480	0.000***
Creative goods and services vs Online creativity	2.951	0.858.
Online creativity vs Intangible assets	142.980	0.000***

We see that, in the knowledge and technology outputs pillar, knowledge impact shows statistically significant differences from both knowledge creation ($\chi^2 = 17.05$, $p < 0.001$) and knowledge diffusion ($\chi^2 = 33.39$, $p < 0.001$), indicating it is the main driver of performance in this pillar. However, knowledge creation and diffusion do not differ significantly ($\chi^2 = 1.974$, $p = 0.16$), suggesting they contribute similarly. A similar pattern is observed in the creative output pillar. Intangible assets differ significantly from both creative goods and services ($\chi^2 = 175.48$, $p < 0.001$) and online creativity ($\chi^2 = 142.98$, $p < 0.001$), while creative goods and services and online creativity are not significantly different from each other ($\chi^2 = 2.951$, $p = 0.858$). This position is intangible assets as the most important contributor to creative performance.

Together, these results highlight knowledge impact and intangible assets as the most differentiated and potentially impactful sub-pillars within their respective output categories.

Table 3: Estimated Effects of Changes in Indicator Rankings on Sub-Pillar Ranking (2013-2022)

Sub pillar	**Indicator**	**Coefficient**	**Standard error**	**N**	**R-square**
Knowledge Impact	Labor productivity growth, %	0.276***	0.041	228	0.434
	New businesses/th pop. 15–64	0.143 *	0.061		
	Software spending, % GDP	0.197	0.188		
	ISO 9001 quality certificates/bn PPP$ GDP	0.222*	0.184		
	High-tech manufacturing, %	0.235***	0.056		
Intangible assets	Trademarks by origin/bn PPP$ GDP	0.959 ***	0.154	231	0.218

	Global brand value, top 5,000, % GDP	-0.062	0.286
	Industrial designs by origin/bn PPP$ GDP	0.219	0.185

Note: The asterisk in this table shows the significant indicators.

Table 3 includes all the indicators which are used to construct the knowledge impact and intangible assets sub-pillars. The GII dataset (Brás, 2022), spanning 2013–2022, has incomplete data for several indicators in earlier years (2013–2020), with missing values marked as "n/a" and excluded from sub-pillar scores (WIPO, 2024). Specifically, only 2021 and 2022 provide complete data for all indicators under the knowledge impact and intangible assets sub-pillars. This data completeness ensures robust panel regression results, as incomplete data in earlier years would compromise analytical reliability. The smaller sample size reflects the focus on these two years, which also benefits from improved data quality following the 2022 GII methodological revision. Table 3 highlights key indicators that improve the rankings of the selected sub-pillars. For knowledge impact, significant indicators include labor productivity growth, high-tech manufacturing, and, to a lesser extent, ISO 9001 quality certifications and entry density for new businesses. In the area of intangible assets, trademarks by origin per billion PPP$ GDP stand out as a critical indicator.

Improving data accuracy and completion from the reporting countryside may be considered a quick win, if it helps to improve GII rankings. Accordingly, to better understand the implications of data completeness and timeliness on GII rankings we investigate the statistical relationship between data integrity and a country's performance in the Global Innovation Index (GII). The results from estimating Equation (2) are presented in Table 4.

Table 4: Multiple Linear Regression Results for Missing and Outdated data – GII Rank and GII Scores

Variable	**GII Ranks**			**GII Scores**		
	Estimate	**Std error**	**P-value**	**Estimate**	**Std error**	**P-value**
Intercept	14.713	3.409	0 ***	48.626	1.459	0 ***
Missing indicators	3.388	0.302	0 ***	1.073	0.129	0 ***

Outdated indicators	1.966	0.312	0 ***	0.688	0.133	0 ***

Note: The asterisk in this table shows the significant levels.

The multiple linear regression results presented in Table 4 provide evidence of the significant impact of data integrity on a country's Global Innovation Index (GII) ranking. The analysis reveals that an increase in the number of missing or outdated indicators is associated with a significant deterioration in a country's GII score and rank, where higher ranks indicate poorer performance. Specifically, for each additional missing indicator, a country's GII rank worsens by approximately 3.39 positions, while each outdated indicator contributes to a decline of around 1.97 positions. Both variables are statistically significant at the 0.001 level, highlighting the strong influence of incomplete and outdated data on global innovation assessments. These findings underscore the importance of submitting high-quality, timely data for international indices like the GII, as data deficiencies can obscure true innovation potential in global comparisons.

To enhance Sri Lanka's Knowledge and Technology Outputs, ranked 66th in the 2022 GII, targeted policy measures should focus on key indicators such as labor productivity, patent applications, and high-tech exports. Simplifying the regulatory process and providing the necessary financial access to startups, along with promoting technology adaptation among the SMEs to improve the labor productivity, encouraging the adoption of quality management systems such as ISO 9001 into the businesses and offering financial aids for the development of high-tech industries while encouraging private public partnerships can enhance the performance in the knowledge impact sub pillar. India has focused on sector-specific training and leverage collaboration between government and certain industries to expand training and to improve labor productivity in the country, while Philippines have focused more on upskilling the workforce in the business process automation sector to fulfil the evolving tech demands (Shah, 2023). As Arora and Gambardella (2005) highlight, the software industry serves as a strategic engine for innovation, with spillover effects that enhance technological capabilities across sectors. Drawing from this, Sri Lanka could strengthen its domestic software ecosystem to catalyze broader innovation outcomes, particularly through targeted policy frameworks such as protected innovation zones. To enhance the high-tech manufacturing in the country, encouraging foreign direct investments through minimal procedures and quick approvals, establishment of high-tech industrial zones with favorable tax rates to attract investments in renewable energy, electronics and to enhance the job

creation, skill development and increased GDP contribution. To further boost high-tech manufacturing, Sri Lanka can replicate South Korea and Singapore's strategies by investing in workforce development tailored to Industry 4.0 technologies (Bondarenko et al., 2020). To address the gap in ISO 9001 certifications, public campaigns and technical support for SMEs, inspired by global best practices, can promote early transition planning and training for ISO 9001:2015 adoption, which has shown improved implementation success (Ciravegna Martins da Fonseca et al., 2019). Investing in workforce development programs such as national training programs with the focus on digital skills, automation, creating flexible labor market policies to reduce the unemployment level in the country and protect the labor rights of employees while assessing labor productivity against the industry standards. Additionally, to address missing and outdated data impacting GII rankings, Sri Lanka must prioritize completeness in the data collection systems and strengthen the systems by enhancing the coordination among the national reporting agencies to ensure a fair and accurate reflection of innovation capacity, such as reporting patent filings and ICT services exports. These measures can boost Sri Lanka's knowledge impact, creative capacity and global competitiveness.

For Creative Outputs, where Sri Lanka ranked 69th in the 2022 GII, policies should target increasing the number of trademark registrations and intangible asset intensity to strengthen the creative economy. Encouraging creative industries such as design, fashion and media by providing grants to generate intangible assets such as brands and designs can enhance the performance in the intangible assets sub pillar. Enhancing the intellectual property infrastructure such as hardware, software and network services fosters the awareness and accessibility of the modernized digital systems for SMEs and startups. Motivate the firms to create innovation, drive product designs and improve brand valuation globally. As part of these efforts, SMEs and startups can be encouraged to file trademarks by making it easier to register businesses (such as via digitalization) as well as offering tax incentives. By harmonizing with global trademark systems such as the Madrid Protocol, countries like Sri Lanka can use the same for international registration of branded achievements within their territory to gain recognition worldwide (Çela, 2015). Also, collaboration with universities and government authorities can continue to help create startups in brand and design development via entrepreneurship hubs.

5. Limitations of the study

This study is subject to certain limitations. First, the data set used covers 133 countries from 2013 to 2022, but some years contain incomplete data for specific indicators, which may influence the accuracy of panel regression estimates. Second, the Global Innovation Index itself relies on both quantitative and qualitative indicators, and potential biases may arise from data coverage differences across countries or from outdated data submissions. Hence, caution should be used in interpreting the results and future research should leverage updated data or datasets validated by country, for more accurate estimates.

6. Conclusion

The paper undertakes a comprehensive analysis of key factors affecting Global Innovation Index (GII) with in-depth study of the sub-pillars and indicators of the pillars of knowledge and technology outputs and creative outputs. The results underscore the significance of sub-pillars knowledge impact and intangible assets, together with particular indicators including labour productivity, ISO 9001 certifications, and trademark registrations. Moreover, this paper demonstrates that data integrity has a substantial role in shaping the innovation capacity of a country and that lack of information or outdated statistics can skew this global ranking. In the case of developing countries like Sri Lanka, increasing the innovation ecosystem and enhancing the innovation ranking means paying strategic attention to such areas of high impact, and also making sure the completeness and timeliness of the data submissions. These insights are useful guidance for policymakers on how to prioritize resources, make specific reforms and help place the country more favourably in the global knowledge economy.

This research uniquely combines data integrity with cross-country innovation benchmarking, providing a holistic perspective on how data completeness and quality influence global innovation assessments. Drawing lessons from peers such as India, the Philippines, and South Korea, the study outlines actionable strategies such as improving data coordination, promoting high-tech manufacturing, and fostering intangible asset creation that Sri Lanka and other developing nations can adopt to strengthen innovation ecosystems and enhance their Global Innovation Index (GII) performance.

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