

# HOW FRONTIER READINESS EXPLAINS CREATIVE SERVICES EXPORTS: AN EMPIRICAL STUDY OF 44 COUNTRIES

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## Abstract

The current study explores the factors that influences the creative service export of 44 countries over the period 2008 to 2021 taking the components of the Frontier Readiness Index namely, ICT index, Skills Index, Research & Development Index, Industry Activity index, and Access to Finance Index as explanatory variables. The study uses the panel data econometric model, Panel Corrected Standard Errors – truncated, to tackle the issues related to heteroscedasticity and serial correlation inherent in panels. Outcomes show a clear divide between nations with a highly developed creative services exports market, such as the USA, China, and several European countries, and those countries that export even less creative services. As per the results of the model, a few components such as technological advancement, investment in R&D, and industrial productive activeness in a country play significant role in the boosting Creative Services exports. On the other hand, the Skills Index and Access to Finance Index did not depict an influence thus pointing to possible areas where policy development may be required. The analysis also reveals the fact the European country trading partners have distinct pattern of exports as represented by the substantial Europe dummy variable coefficient. These conclusions might be of great concern for the policymakers of those countries trying to improve their Creative Industry sector's competitiveness. Lastly, the paper presents the limitations of the study and research directions that may be undertaken in due course for deepening the analysis of creative services exports.

**Keywords:** Creative Services Exports, Frontier Readiness Index, Panel Data Econometrics, ICT Index, Research & Development, Industry Activity Index, Policy Intervention.

## INTRODUCTION

Creative services form a big segment of the new economy, comprising many branches like advertising/communication, architecture, arts/culture, design, film/movie/media, music, publishing, software, and video games. These industries are defined by the focus on individual entrepreneurship based on creativity, skill, and talent as the primary driving force behind economic progress and development. Global market trends for the last few years have now illustrated higher growth in the creative services industry and some of the countries which are emerging as major exporters. Having an appreciation of the exports of creative services is important for those countries' leaders who are interested in boosting the competitiveness of their economies. While some countries – the lead players of this sphere all over the world are the USA and China, there are many others that aspire to develop and bolster their creative industries (Bodén, 2021; Keane, 2013; Vasylytsiv et al., 2021). The goal of this study is to determine which factors impacts creative services exports and analyze the differences in this respect among different economies.

The Frontier Readiness Index which includes the ICT Index, Skills Index, the Research & Development Index, the Industry Activity Index, and the Access to Finance Index which form an important framework for understanding the determinants of Creative Services exports (Ceko & Mulita, 2023; Frontier Technologies Readiness Index, 2023; Statistical Appendix Readiness for Frontier Technologies Index, 2021). Establishing this framework, the study seeks to investigate the correlation of the outlined indices for the period 2008–2021 with creative services exports in 44 nations. This research uses the Panel Corrected Standard Errors (PCSE) model to tackle typical problems like heteroscedasticity and serial correlation in panel data. The contribution of this study is expected to be of value toward understanding and shaping the future directions of creative industries policies aimed at boosting the sector. By examining the macro and micro characteristics of the economy where different creative services operate by determining the relative advantages of economies in using ICT facilities and development, availability and skills, investment in R&D, industrial activity, and access to finance, this research can contribute to the development of the set of factors that influence exports of creative services.

To sum up, the proposed research seeks to further enlighten the vital factors that have influenced worldwide creative services exports, and more especially an analytical discussion of such trends and patterns. The findings from the research will be useful to various stakeholders such as policy makers to arrive at better policies as well as strategies for the improvement of competitiveness of creative industries across the globe.

## LITERATURE REVIEW

The creative services industry plays a crucial role in driving economic growth and innovation globally. Various studies have explored the determinants of creative services exports, emphasizing the importance of factors such as technological infrastructure, skilled labor, research, and development (R&D), industrial activity, and access to finance. Theoretical frameworks highlight that the development of information and communication technology (ICT) infrastructure is vital for the growth of creative industries (Kler, 2016; Kler et al., 2023; Mansi Batra, n.d.). ICT facilitates the production, distribution, and consumption of creative products, thereby enhancing export potential. Empirical studies corroborate this, showing a positive correlation between ICT development and creative services exports (Alibekova et al., 2020; Skare et al., 2023).

The availability of skilled labor is another critical factor influencing creative services exports. Skilled professionals in fields such as design, media, and software development drive innovation and quality of creative outputs. Research indicates that countries with higher education levels and better training facilities for creative professionals tend to have higher exports in the creative sector (Salma & Refi Rifaldi Windya Giri, 2023). Investment in R&D is essential for fostering innovation and competitiveness in creative industries. Countries that allocate substantial resources to R&D activities often see enhanced creativity and technological advancements, which, in turn, boost their creative services exports. Studies have consistently shown a strong positive relationship between R&D expenditure and export performance in creative services (Huerta et al., 2022).

Industrial activity and the level of manufacturing sophistication also play a significant role in determining creative services exports. Economies with robust industrial sectors can better support the production and commercialization of creative goods and services. Empirical evidence suggests that countries with higher levels of industrial activity tend to have more substantial creative services exports. Similarly, access to finance is crucial for the growth and sustainability of creative industries (Gvetadze, 2018; Iqbal & Masood, 2022). Financial resources enable firms to invest in new projects, technologies, and market expansion. Studies indicate that better access to finance is associated with higher export levels in the creative sector, as it supports the growth and internationalization of creative enterprises.

### Conceptual Framework

The conceptual framework for this study is built around the Frontier Readiness Index, which is composed of several key indices including: ICT Index, Skills Index, Research & Development Index, Industry Activity Index, and Access to Finance Index. This framework has laid out a Model in which multiple elements that are responsible for creative services exports in different countries can be identified systematically. These indices are regarded to affect the export performance of creative services in the following manner.

**ICT Index:** The ICT Index represents the respective ICT's degree for each economy. This implies that given that developed ICT enhances the generation, distribution and consumption of creative services, export record shall be enhanced. A closer look at economies advanced in ICT is expected to record stronger connectivity, digital tools, and platforms for CI.

**Skills Index:** The Skills Index captures the skill level and density of human capital needs in each country's economy. It is grounded on the assumption that a skilled and literate human capital is the primary requisite for progressive growth of the creative economy. The availability of higher skills is evidenced by higher 'index' score, which suggests more professionals in creative industry specialized areas such as design, media, and technology relevant to delivering value-added creative service.

**Research & Development (R&D) Index:** The R&D index is used with an aim of capturing both the investment and the emphasis on research and development in an economy. The premise used here is that increasing investments in research and development generate better innovations and more advancements in technology, which in turn boosts the ability of creative services exports to compete. Economies that invest more in R&D are capable of undertaking innovation that leads to other products and services that can conquer international markets.

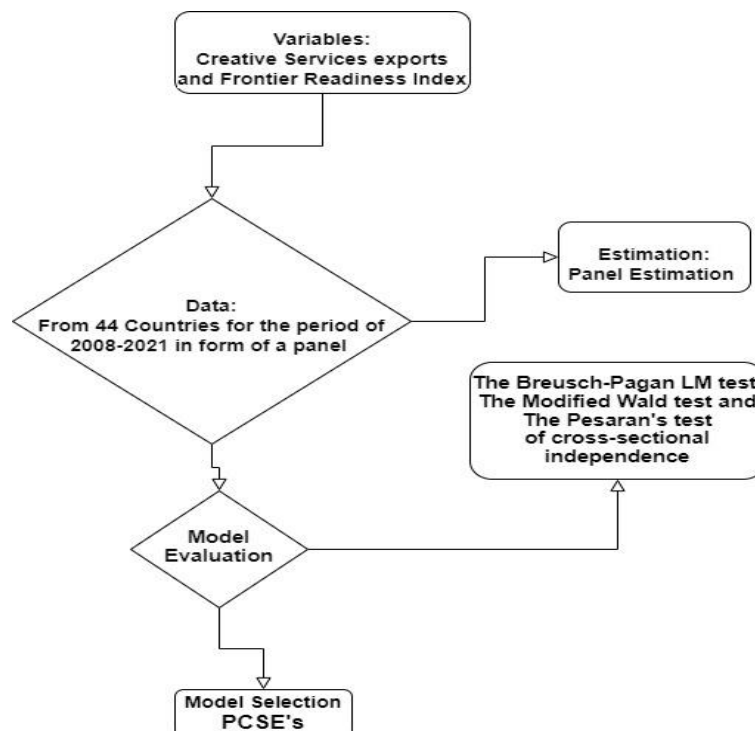
**Industry Activity Index:** The Industry Activity Index totals the amount of Industrialization and Manufacturing activity in an economy. The industrial sector is regarded as beneficial for the creative industries as it offers certain infrastructures, resources, buildings, and logistic networks. Industry development postulated as an index of export capacity to countries shall predict high capabilities for developing and exporting creative goods and services.

**Access to Finance Index:** The index focuses on the ability of a specific economy to obtain financial services. Fresh capital is thus important for the continuous growth of creative venture thus they seek funding. Businesses in developing countries need to

access early financing systems so that creativity can fund new ventures, technologies, and markets, creating export capacity.

## METHODOLOGY

For the purpose, the study uses a panel dataset obtained from 44 countries in which data are collected over the period of 2008-2021. The variables are the volume of international trade in creative services expressed in US dollars for each year and selected indexes from the Frontier Readiness Index, including the ICT Index, the Skills Index, the (R&D) Index, the Industry Activity Index, and the Access to Finance Index. Figure 2 describes the detail of the methodology that is followed for the current study. Figure 1 below shows the flow of methodology.



**Figure 1: Flow of Methodology**

In this framework, the exports of creative services are taken as dependent variable, accounting for the annual value of exports in US dollars for each country. These are several indices, which depict different aspects of development and capability of a country and they are considered as independent variables. The ICT index refers to the overall ICT index that indicates the state of development of the technology in terms of information communication technology and Internet connectivity. The Skills Index measures the provider's characteristics and quantity of high skill for new and innovative industries. R&D Index is a measure of the index of research and development that focuses on the volume of investment in research and development as an indicator of the innovation capability of a country. The Industry Activity Index reveals the general level of industrialization and manufacturing activity in industry and the production sector. The Access to Finance Index presents the elements of financial services that are crucial for supporting business development and innovation. However, to include Europe among the innovative states, a control Dummy Variable is included as an independent variable with its value equal to one for European countries and zero for other countries.

## Econometric Model

For assessing effects of the different indices on creative services exports the study uses the Panel Corrected Standard Errors (PCSE) model, suitable for use when the data set has issues such as heteroscedasticity and serial correlation, which are common problems with panel data. The econometric model is specified as follows:

$$\begin{aligned} \text{exports\_creative}_{it} &= \beta_0 + \beta_1 \text{ict\_index}_{it} + \beta_2 \text{skills\_index}_{it} + \beta_3 \text{research\_develop\_index}_{it} \\ &+ \beta_4 \text{industry\_activity\_index}_{it} + \beta_5 \text{access\_to\_finance\_index}_{it} \\ &+ \beta_6 \text{dummy\_europe}_{it} + \mu_{it} \end{aligned}$$

Where:

$\text{exports\_creative}_{it}$  is the creative services exports in US dollars for country  $i$  in time period  $t$ .

$\text{ict\_index}_{it}$  is the ICT Index value for country  $i$  in time period  $t$ .

$\text{skills\_index}_{it}$  is the Skills Index value for country  $i$  in time period  $t$ .

$\text{research\_develop\_index}_{it}$  is the R&D Index value for country  $i$  in time period  $t$ .

$\text{industry\_activity\_index}_{it}$  is the Industry Activity Index value for country  $i$  in time period  $t$ .

$\text{access\_to\_finance\_index}_{it}$  is the Access to Finance Index value for country  $i$  in time period  $t$ .

$\text{dummy\_europe}_{it}$  is a dummy variable for European countries, equal to 1 if the country is in Europe and 0 otherwise.

$\mu_{it}$  represents the error term.

Based on the indices described, the following hypotheses are proposed.

- H1:** A higher degree of ICT development has a positive effect on the creative services export.
- H2:** A greater abundance of knowledgeable workers has a positive impact on exportation of creative services.
- H3:** Increased investment in research and development directly has a positive impact on creative services export.
- H4:** Same with strong industrial activity in the nation that also depicts positive impact on creative services exports; and
- H5:** Better access to finance also shows positive impact on the creative service exports.

Before model estimation, several key tests are performed to confirm the appropriateness of the use of panel data technique. The Breusch-Pagan LM is the test for heteroscedasticity is considered to examine the dispersion of residuals with a low and significant p-value suggesting that the variance of residuals is not constant. The test that is used frequently for determining groupwise heteroscedasticity is the Modified Wald Test for Groupwise Heteroskedasticity which tests the hypothesis that error indicates that if the calculated p-value is less than the significance level, then there is significant groupwise heteroscedasticity is adopted. Pesaran cross-sectional

‘augmented’ Wilks’ Lambda test is conducted to check null hypothesis of cross-sectional independence of observations in the panel data set and if observed test statistic is significant, then it can be inferred that observations are cross-sectionally dependent.

### Estimation Method

Based on the results of the pre-estimation tests which suggest heteroscedasticity and possible cross-sectional dependence, the use of PCSE estimation is recommended. An importance of the PCSE is that the standard errors are efficient for panel data with heteroscedasticity and serial correlation of any form while the coefficient estimate was found to be highly accurate.

### Model Estimation and Interpretation

The model is estimated via Prais –Winsten regression technique, which has the attributes of both fixed and random effect techniques with correlated panels and the standard errors are corrected. The t-statistic coefficients that correspond to the independent variables are used to measure the effect of creative services exports. The utility of each coefficient is then established by examining the p-values, while the overall fitness of the model is analyzed by the R-squared as well as the Chi-square-test value.

## RESULTS AND DISCUSSION

### Variable Characteristics

It can be revealed that there are large fluctuations in the extent and volatility of creative services exports across various economies. For example, having very few exports as compared to other countries, Afghanistan exported products worth \$86 million while USA exported products worth \$205,922 million. It also relates to the productivity levels and the kind of economies of the two areas involved in trade. This can be visualized in figure 2. Such sources of time discrepancies may involve a shift in the pace of business operations or changes in productivity, production flow, or other organizational structures.

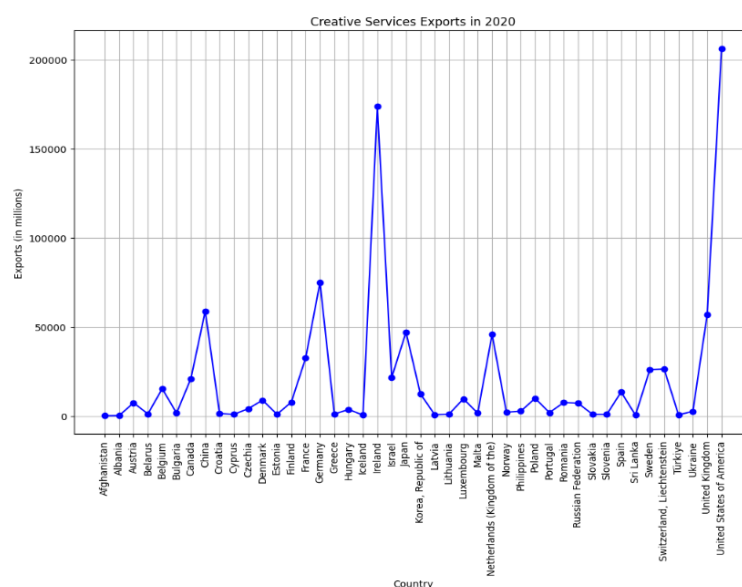
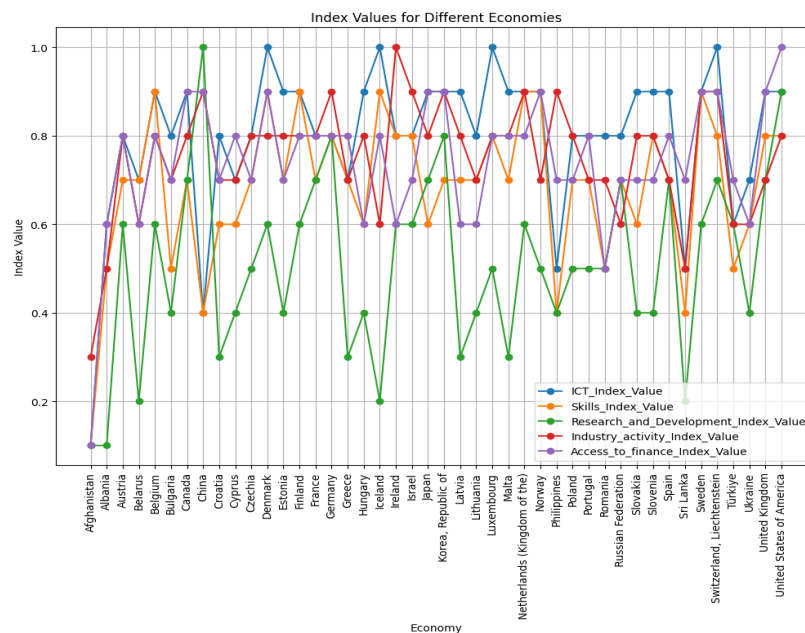


Figure 2: Variation in Services Exports



As observed from the above the export tendency shows that the countries like of United States, China and few European countries like Germany, United Kingdom and France have relatively higher export and thus it can be concluded that the creativity services industries in these countries are highly developed. There were certain patterns, which could be peculiar to the regions. From the data, it can be observed that the major exporting countries such as Germany, France and the Netherlands are part of Europe, which indicates the robust international market of creative industries here. Asian economies such as China and Japan have signification export in the creative services in the same way. As a result, the findings can aid policymakers and shed light on the competitiveness of creative industries and assist in creating policies and promoting creative services exports appropriately.

The Frontier Readiness Index with ICT Index, Research & Development index, Industry activity index, and access to finance index to explore and analyze all the 44 frontier economies for the year 2008-2021. The graph below in figure 3 presents the detail index values for the selected economies for the indicator year 2021.



**Figure 3: Components of Readiness Index**

The ICT index indicates the relative advancement of information and communication technology in an economy. The listed countries including Denmark, Netherlands, and Sweden have near unity ICT index, therefore signify high ICT development. There are some countries that have low values of ICT index which includes Afghanistan, Canada and Korea, Republic of. The skill index values represent the status and access to skilled human capital in economies in question. Economies ranked high in skills index include Finland 0.9, Ireland 0.9 and Sweden 0.9, this show that those economies have well educated skilled workers. On the other hand, countries such as Albania, Belarus and Philippines have relatively low skill interest scores.

The R & D index indicates the provision and attention provided for research and development activities. This is especially the case in developed economies such as Asia, Europe, and the Middle East, with Israel, Japan, and Switzerland, Liechtenstein having a relatively high research and development index of 1.0 showing a high level of investment in technology and innovation.

At the same time, some countries, such as Afghanistan, Belarus, Sri Lanka, occupy low rates of the research and development index. The value of the index that expresses the level of industrial activity signifies the level of activity within the manufacturing industry of the economy. Germany, Korea, and Russian Federation values of the Industry Activity Index equal 1.0 suggesting strongly industrialized nations. On the other hand, Afghanistan, Greece, and Sri Lanka are located at the bottom right side having less than 0.05 values of industry activity index.

The access to finance index is a measure of the level of access to finance in the economy and the availability of financial services. As the figure implies the access to finance, which measures the quality of financial systems ranges from 0 to 1, with economies such as Israel, Luxembourg, and Switzerland, as well as Liechtenstein scoring 1. On the other hand, there are countries such as, Afghanistan, Cyprus as well as Ukraine, which have been ranked relatively low having values of access to finance indexes.

Most of these index values help to compare the strengths and/or the levels of development of each economy in the context of ICT usage, skills supply, research and development intensity, industrial power, and access to financing. Through its use, it is possible to evaluate competitiveness, compare inter-and intra-country performances, and even analyze scopes for development.

## Econometric Model Results

### Pre-Estimation Tests

#### Breusch-Pagan LM Test for Heteroscedasticity

The Breusch-Pagan LM test is a chi-square test that tests the null hypothesis that the error terms are homoscedastic in the given regression model. The null hypothesis is of constant variance or homoscedasticity, which means that variance of the residuals is same. Thus, if a p-value is obtained that is statistically significant then it can be concluded that there exists heteroscedasticity. The test utilizes a Chi-square statistic to assess the hypotheses: The null hypothesis ( $H_0$ ) here is that the variance of the residuals does not differ across levels of a particular independent variable (homoscedasticity), while the alternative hypothesis ( $H_1$ ) is that the variance of the residuals does differ across the levels of a particular independent variable (heteroscedasticity). The results are shown in table 1.

**Table 1: LM Test Results**

Test	Chi-square Statistic	Degrees of Freedom	p-value
Breusch-Pagan LM	4074.041	946	0.0000

Since the p-value is equal to 0, we can conclude that there is heteroscedasticity in the model since the null hypothesis was rejected in favor of the above hypothesis.

#### The Modified Wald

The Modified Wald test examines the null hypothesis if the variances of the error terms are same across groups or panel and units. Hence, where there is homoscedasticity in the underlying population, while for heteroscedasticity in the underlying population of each group, the computed test statistic will sum to a significantly small p-value. The test applies a Chi-square statistic to arrive at its conclusions. The null hypothesis ( $H_0$ ) that is therefore tested is the one asserting that the error terms are homoscedastic, meaning that their variance is equal across the different groups. On the other hand,



the null hypothesis (H0) assumes that the variance of the error terms is the same across the groups, suggesting no heteroscedasticity or groupwise heteroscedasticity while the alternative hypothesis (H1) assumes that variance of the error terms differs across the groups, therefore suggesting group wise heteroscedasticity. This test is crucial for detecting heteroscedasticity within the panel data, which compromises the accuracy of the estimates ascribed by this model. Table 2 lists the results of the test.

**Table 2: Modified Wald Test results**

Test	Chi-square Statistic	Degrees of Freedom	p-value
Modified Wald	1.3e+05	44	0.0000

As mentioned, the p-value (0.000) is significantly less than alpha which means we have sufficient evidence to reject null hypothesis on grounds of groupwise heteroscedasticity.

Additionally, Pesaran (2007) presented a general test for cross-sectional independence that offered a set of unified test statistics for hypothesis testing. The test results are as follows:

**Table 3: Pesaran Rest Results**

Test	Test Statistic	p-value
Pesaran's	10.420	0.0000

Since the p-value of the test statistic is at a near zero, it leads to a rejection of the null hypothesis and hence there is cross-sectional dependence among the observation.

### Implications for Model Estimation

Due to the results of preliminary estimation tests, the suggested study uses the Panel Corrected Standard Errors (PCSE) model. This model handles heteroscedasticity and cross-sectional dependence and comes with conservative standard errors and correct coefficient estimations.

### Model Results: PCSEs

The table below presents the estimated results from the PCSE model:

**Table 4: Model Results PCSE's**

Variable	Coefficient	Standard Error	t-value	p-value	Significance
ict_index_value	5187.089	15345.211	4.03	0.004	**
skills_index_value	7502.607	7148.823	1.05	0.294	
researchanddevelop_index	39415.967	7573.64	5.20	0.000	***
industryactivity_index_value	22728.226	6599.99	3.44	0.001	***
accesstofinance_index	7114.818	7737.995	0.92	0.358	
dummysyurope	-13085.661	1986.527	-6.59	0.000	***
Constant	25287.119	7287.662	-3.47	0.001	***

**Table 5: Model Overall Fit**

Metric	Value
Mean dependent var	15691.711
SD dependent var	32493.722
R-squared	0.188
Number of obs	484
Chi-square	136.828
Prob > chi2	0.000
rho	0.823

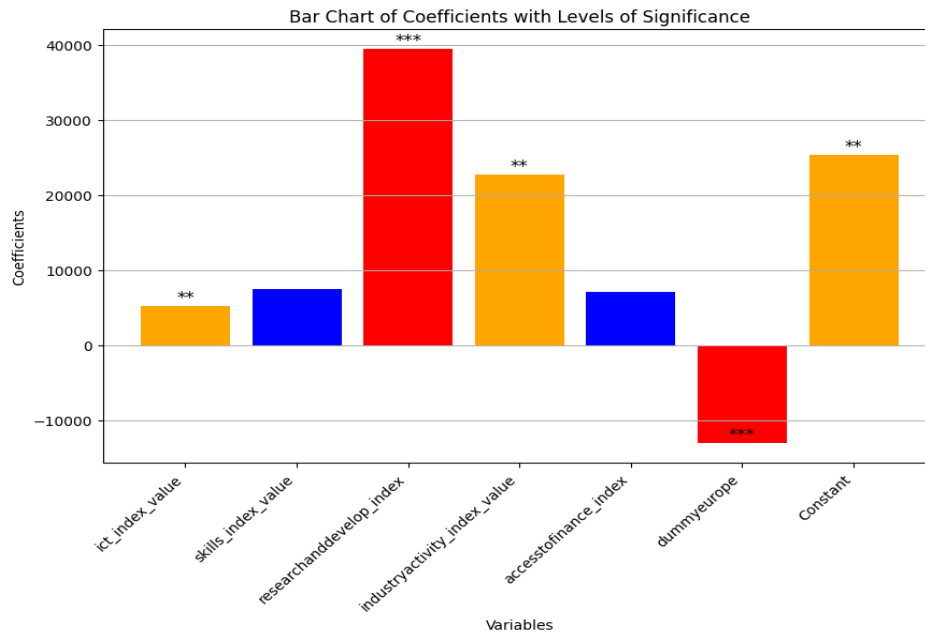
## Model Evaluation

The Wald test for panels examines the hypothesis that the variability of the residuals is the same for all groups. Using a Chi-square statistic this test yields its outcomes. The null hypotheses are based on the variance of the error terms; the null hypothesis is that the variance of the error terms is the same for all groups, and these groups are homoscedastic. On the other hand, the null hypothesis (H0) assumes that the error terms have the same variance, and therefore, the model again assumes homoscedasticity on the other hand, the alternative hypothesis (H1) expects the variance of the error term to vary with the group, hence group wise heteroscedasticity. The low p-value from the test suggests the null hypothesis of homoscedasticity in each group is rejected, thus the presence of groupwise heteroscedasticity implies that the variances of the error term are not same across the groups. This test is important in establishing the presence of heteroscedasticity, which is common in the panel data, and is likely to affect the efficiency of the following estimates.

The current and previous estimates confirm presence of heteroscedasticity as well as cross-sectional dependency; this explains use of PCSE in estimation of model results. The findings derived from the model reveal that out of the five indices, ICT Index, R&D Index, and Industry Activity Index are causing creative services exports while skill Index and access to finance index are insignificant at conventional level of significance. Significant differences can be also observed in Europe dummy variable, which distinguish between regional characteristics of export performance. This work offers the critical data for the policy makers with an intention to boost the competitiveness of the creative industries.

## Key Findings

The ICT index has a positive and significant sign in the regression equation with the coefficient value of 0.05 level, which means that as the extent of ICT advances the level of creative service export also rises. The coefficient estimate of the Skills Index is positive and for the most part insignificant thus suggesting that skilled labor did not affect the exports in the creative services sector in the samples studied. The coefficient for the R&D Index is positive and there is validity if we look at the highly significance level at 0.01 level, it means that high investment in Research & Development has the propensity of enhancing exports of creative services tremendously. This also applies to the Industry Activity Index that registers a positive and significant estimate at the 0.01 level, and this suggests that exports of creative services are heavily influenced by segments of industrial origin above a certain scale. In the case of the Access to Finance Index coefficient, although the result is positive and indicates that access to financial services affect creative services exports in the sample positively, it is statistically insignificant, and thus we cannot attribute significance to the impact of the variable. Thirdly, the negative and highly significant coefficient of Europe indicates that creative services exports are less in European countries than non-European countries, other things held constant. The coefficients are visualized in figure 4.



**Figure 4: Coefficient Values**

Furthermore, a substantial and positive coefficient for the ICT Index shows the fact that technological infrastructure has a key influence in increasing creative services exports. Countries that have enhanced ICT capacities are in a better place to develop, supply, and promote creative services across the world. Despite insignificant results with the Skill Index, the positive coefficient implies that the increased opportunity of skilled labor might be associated with exports of creative services, which needs further investigation. The higher and positive value for the R&D Index substantiates the role of innovation and technology in supporting creative services exports since increased levels of R&D generate new forms of competitive creative products. In addition, it shows that a strong Industrial Activity Index has a strongly positive correlation with the export of creative services as the industrial industry offers the appropriate environment and resources to facilitate the growth of the creative industries. On the other hand, the insignificant coefficient value for the Access to Finance Index indicates that other factors may possibly be more influencing on creative services exports in the sample. This could mean that comparability of finance accessibility is reasonably constant across countries or that financing plays an extraneous role. Lastly, the negative and significant coefficient of the Europe dummy indicates that on average the exports of creative services are relatively much lower in Europe compared to countries outside Europe. This implies that aspects like market maturity or variations in industry characteristics in Europe, for instance, might distort the export performance.

## CONCLUSION

The understanding of the fundamental drivers of creative services exports is explored in this investigation for 44 countries between 2008 and 2021 by using Frontier Readiness Index that consists of ICT Index, Skills Index, R&D Index, Industry Activity Index, and Access to Finance Index. This is achieved by applying the Panel Corrected Standard Errors (PCSE) model that eliminates the heteroscedasticity and cross-sectional dependence problem. The key findings from the analysis can be summarized as follows.

The particularly high and positive coefficient of the ICT Index also supports the conjecture that investing in the right technological foundations will lead to improved creativity in exports of services. Innovative economies with improved ICT competency are in a better place in advancing and marketing companion creative services. Something that can be inferred from the Skills Index, albeit in a relatively slight measure, is that the availability of skilled labor could be positively correlated with exports of creative services, and thus, a further investigation of the matter might be warranted. The positive relationship between the R&D Index and the CMS exports implies that the ability of the exported services to be innovative determines the advancement in technological competitiveness in delivering creative services exports as R & D promotes technological changes to create new competitive services. The strong and positive relationship with the Industry Activity Index suggests that a strong industrial sector fosters the manufacturing and exportation of creative industries by availing the necessary systems, tools and demands that creative industries require to operate effectively. On the other hand, the insignificance of the Access to Finance Index could mean that other aspects could define the export of creative services in the sample. This could suggest that finance or its absence is less of an issue that varies significantly between countries or that it has a minor impact on innovation.

### **Significant and Non-Significant Predictors**

It also determines variables with significant coefficient for creative services exports namely the ICT Index, R&D Index, industry activity index and the dummy for Europe while the skills index and access to finance index are insignificantly related to exports in addition to identifying the key precursors for creative services exports, the analysis also shows that the skills Index and the access to finance index insignificant in the exports. Some analysis was done according to the region of exportation, and the findings showed that relative to non-European countries, the creativity export was lower in European countries, perhaps because the market was already flooded or because of other factors that may exist within the industry. This disparity underlines the concern with the pursuit of region-appropriate strategies to promote the export of creative services.

The policies derived from the study have detailed the following implications that can lead to improving creative services exports. To support and promote creative services, namely because customers need them, there is need for policymakers to harness ICT structures in delivery of creative services. They should also encourage spending on research and development to spur creativity and advancement in technological innovation in the creative industry sector. Supporting industries can offer industrial facilities and requirements that may benefit creative industries. Promoting industries can enable the creative industries to get all the physical structures they need. Furthermore, they should focus on the regional characteristics of relative industries and bring forth innovations regarding regional conditions.

The recommendations include an increase in digital access by expanding access to high speed, broadband internet and online networks establish innovation centers, incubators, and accelerators to assist start-ups and SMEs particularly in the creative industries. Cultivate endowments in academic organizations for creation of more creative products and innovative services. Better access to finance, although not substantial in this study, can assist creative industries to expand their companies and move more quickly to the global market. Some of the recommendations include the

government offering regional development programs to support local initiatives with specific regional needs and tapping in this sector for creativity.

Possible approaches to develop creative services exports consist of persuading the creative businesses to adapt advanced technologies and sites for exporting their products, to develop team-up with creative professionals and industries for developing new categories of products and services, to offer development programs to sharpen the talent of the service providers, and to diversify the markets for exports to reduce reliance on conventional export markets.

These include the limitations arising from the uneven quality and availability of data on creative services exports as well as the indices employed in the analyses. The discussed PCSE model offers the solution to heteroscedasticity and cross-sectional dependence issues, however, the other possible problems like endogeneity are not directly solved. Potential improvements on and developments for the new research include employing a larger sample cross-section of data that is more contemporary, expanding the countries in the analysis, accounting for possible endogeneity with the use of instrumental variables or other, more sophisticated techniques, examining the segmentation of the analysis within the creative industries to identify the specific drivers of exports in the sub-sectors, and then assessing the effect of specific policy measures for creative services exports in order to inform the policymakers

In sum, the study proves that ICT development, R&D investment, and industrial output processes are key factors affecting the export of creative services. Together, the results provide useful recommendations for the leaders and decision makers interested in increasing the competitiveness of creative industries in the globalized world. Undoubtedly, there is scope to enhance much of the above and bring in broader factors that may affect the exports of creative services.

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