

## What factors drive creative industries in GCC countries?

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*(Received 18- 05-2025; accepted for publication 04-12-2025)*

**Abstract:** The creative economy stimulates innovation and leads to the transmittal of knowledge across all sectors of the economy, fostering comprehensive development. The creative economy is a vital segment contributing to the country's GDP. This study empirically examines the performance and the factors that drive creative industries in six GCC economies using the dataset from 2002 to 2023. We find that the United Arab Emirates is the leading contributor to exports of creative industries, followed by Saudi Arabia. This study examines the factors that drive trade in creative industries and finds that the lagged value of trade of creative industries, GDP growth, financial development index, and mobile technology are significant predictors in GCC countries.

**Keywords:** Creative industries, economic growth, trade, digitalization, interest rate, R&D expenditures

## 1. Introduction

Creative industries play a critical role in economic activities. United Nations Conference on Trade and Development (UNCTAD, 2024) defined creative industries as “creation, production, and distribution cycles that leverage creativity and intellectual capital”. UNCTAD (2008) split creative industries into broad classifications like media, arts, heritage, cultural sites, audio-visual, and creative services. However, the term “creative industries” has no precise definition. As per the classification of Martinaitytė and Kregždaitė (2015), creative industries are divided into economic, technological, social, and cultural factors. They reported that trade of creative industries contributes to the economic growth of a country (Throsby, 2010).

According to UNCTAD statistics, the trade of creative industries has shown tremendous growth over the past decade. The global trade of creative goods and services has surged from US\$ 404 billion in 2002 to US\$ 1,272 billion in 2023 (indicating a compound annual growth rate – CAGR of 5.4%). The total exports of creative industries of six GCC countries were US\$ 270 million in 2002, which had increased to US\$ 22,153 million, showing a CAGR of 22.18%. This shows a considerable increase in the exports of creative industries to GCC countries due to increased demand and available opportunities. Mumtaz and Smith (2022) argued that changes in the dynamics and patterns of creative industries, improved digitalization process, changes in lifestyles associated with creative goods and services, and trade within creative sectors create new opportunities for future growth.

Due to the diverse nature of creative industries, they spur economic development and promote cultural, political, social, and economic growth (Hui, 2007). Researchers (Mumtaz and Smith, 2022; Hui, 2007) also highlighted that creative industries explore multiple opportunities for trading and creating job opportunities. By influencing behaviour and social and institutional development, creative industries contribute to economic advancement besides economic growth and job possibilities (Potts, 2011). Thus, it is crucial to quantify the influence of creativity since it influences the development of the entire economy through various multifaceted factors, including economic, social, technological, scientific, and cultural aspects.

The literature on creative industries is limited (Tubadji, Osoba and Nijkamp, 2015; Martinaitytė and Kregždaitė, 2015; Getzner, 2002). A few studies examined the overall nomenclature by descriptive analysis. Mumtaz and Smith (2022) analyzed the

performance of exports of creative industries by considering 32 Asian countries and identified that the performance varies across countries. In addition, they examined the factors that cause trade in creative industries. However, this study finds no research analyzing the activities of creative industries in GCC countries.

This study aims to analyze the performance of the exports of creative industries in GCC countries and identify factors that drive the trade of creative industries. This study considers the sample of six GCC countries from 2002 to 2023 to test the hypotheses. This study reports that the UAE was the leading contributor to exports of creative industries, followed by Saudi Arabia. However, other countries are putting their best efforts into improving the volume of exports. Following the Markowitz model, this study employs a single-index model and identifies the sensitivity of the exports of creative industries. This study finds that the beta coefficients of all GCC countries are not significant, but the overall portfolio is statistically significant – the export performance of creative industries in GCC countries is sensitive to global trade fluctuations. In addition, Sharpe and Treynor ratios are estimated to evaluate the export performance. Regarding the Sharpe ratio, Saudi Arabia yielded the highest returns, and Qatar obtained the lowest returns, while UAE has the highest Treynor ratio and Oman has the lowest. The other objective of this study is to identify the factors that drive creative industries in GCC countries. This study uses the feasible generalized least square (FGLS) method and finds that the lagged trade of creative industries, GDP growth, and mobile banking are significant determinants. However, the country-wise analysis reports the variation in determinants across GCC countries.

## 2. A review of earlier studies

Creative industries mainly contribute to each economy, comprising heritage, arts, cultural aspects, and creative services (UNCTAD, 2024). However, owing to a surge in technological innovations, the importance of creative economies has substantially increased. According to ADB's (2024) report, technological progression is key to promoting creative goods and services across countries. They reported that digital creative industries have transformed employment opportunities over the past ten years, which also posits the demand for growth in the coming years. Their creative and inventive efforts have a good knock-on impact that affects several other areas, including technology, fashion,

and tourism. Additionally, digital creatives increase the possibility for innovation by advancing technology, which has valuable applications in various fields. Nurse (2021) highlighted that digital and creative goods replace physical goods in the books, gaming, and music sectors. One of the fastest-growing segments of global trade and a crucial aspect of competitiveness in the age of digital globalization is the digital creative economy and the trade that goes along with it (McKinsey, 2016). In one of the studies, Wunsch-Vincent (2006) argued that "the economics behind digitally-delivered content products, namely the high fixed costs of initial production but negligible marginal costs of duplicating and distributing digital copies on a global basis, make them ideal 'tradeables'".

Wang et al. (2024) examined the determinants of digital creative industries in the Yangtze River Delta (YRD) region from 2017 and 2022. They found that technological innovation, market factors, and policy support are the key elements in enhancing the activities of creative industries. Their research was based on the synergistic effects of policy and innovation environments, which also supported Hosseini et al. (2023)'s argument regarding progressing creative industries primarily driven by technological innovation and policy support (Wang, Liu and Zhao, 2023). Previous studies (Chapain and Comunian 2010; Comunian et al. 2010) also identify pertinent location elements that cause the formation of CCIs. Due to their intrinsic characteristics, CCIs typically establish their businesses in major metropolitan agglomerates, often at the expense of more rural locations where they cannot find the best conditions for expansion and startup. However, a different viewpoint suggests that outside the "creative hub" can occasionally offer additional benefits, such as reduced overhead and operating expenses, local networking, support, and creative people's social embeddedness and personal attachment.

Using the UNCTAD data, Gouvea and Vora (2016) analyzed the performance of fuel products, manufactured products, food items and agricultural products, and oral & minerals exports in 44 countries from 1988 to 2012. They used the Markowitz (1952, 1959) approach, which relied on modern portfolio theory to determine the export sensitivity of each country relative to changes in world trade. They estimated the beta coefficient and reward-to-risk ratios (Sharpe ratio – excess returns relative to variations linked with those returns and Treynor ratio – excess returns relative to the systematic risk of that return) to examine the export performance.

They reported regional disparities in the export performance of products of a diversified nature. Moreover, they identified that the beta coefficient of Kuwait is not statistically significant, while Qatar, Saudi Arabia, and UAE had the significant beta. This implies that the sensitivity of exports increases in terms of variation in global trade. As per their findings, Qatar had the highest Sharpe ratio, while Kuwait had the lowest. Alternatively, Kuwait had the highest Treynor ratio, whereas Saudi Arabia had the lowest.

In another study, Mumtaz and Smith (2022) examined the determinants of trade in creative industries by using a sample of 32 Asian countries from 2002 to 2015. Descriptively, they analyzed the exports of different categories of creative industries and found that China outperformed in the entire sample. However, the magnitude of the export of creative industries in other countries is relatively modest. The performance of creative industries was determined using the single-index model, Sharpe, and Treynor ratios. They used the proxy of global trade of creative industries as the benchmark index for estimating the beta coefficient. The results of the beta coefficient show that the sensitivity of countries' exports depends on global trade fluctuations. Moreover, they indicated that China has the highest Sharpe ratio while Brunei Darussalam has the lowest. Contrarily, the results of the Treynor ratio suggest Malaysia has the highest and Bahrain has the lowest ratios. Their results report that GDP growth, mobile banking, internet technology, and interest rates are robust predictors of creative industries in Asian economies. However, the results of region-wise analysis vary depending on the size and market dynamics. Li (2020) analyzed how digital technologies made business model innovations in the creative industries possible. After digging into the previous studies, he developed a holistic business model to explain the complex relations. Further, he identified that digitalization plays a critical role in flourishing creative industries.

Imperiale, Fasiello, and Adamo (2021) investigated the sustainability determinants of cultural and creative industries in peripheral areas, namely, Apulia (Southern Italy) and Western Greece. They used a focused group discussion in 80 Apulian and 34 Western Greek enterprises to analyze the policy framework and how it can support the survival and development of cultural and creative industries. They found that the differences in results between both territories and the policies of creative industries do not fulfill their requirements for improving their business activities. They further

identified that the support provided by creative industries is the same as that offered by other traditional businesses. However, the support is inadequate, and no incentives are available to promote and boost this sector.

According to Mikić et al. (2019), the creative industries have a two-tier effect in any country. Besides increasing exports, the creative industries directly impact GDP and job growth. Additionally, creative industries indirectly influence a nation's overall economic growth and development through spillover effects extending beyond the market mechanism (for instance, transferring knowledge, income, and employment growth in other sectors, enhancing the overall business climate, and improving the country's attractiveness). However, the creative industries provide more than just excellent economic opportunities. On the international scene, they represent the epitome of imagination, inventiveness, and originality that transcend fundamental social and cultural ideals. Newson (2025) pointed out that "the UK government identified the creative industries as one of eight "growth driving" sectors which will prioritize in its industrial strategy". Moreover, this strategy will chalk out the plan to reduce barriers, explore new skills, and overcome the problem of accessing funds.

The performance of creative industries depends on the structural landscape of a respective country, which is likely to influence the evolution of the creative industries within that country. To examine the performance of various aspects of creative industries, Martinaitytė and Kregždaitė (2015) split them into economic, technological, social, and cultural factors. This study uses this classification to examine the performance of creative industries in GCC countries. Furthermore, Kemeny, Nathan, and O'Brien (2020) analyzed the disparities between the US and the UK regarding the evolution and development of creative sectors and postulate that "industrial organizations shape creative intensity, and this is driven by national economic size, industry mix, human capital available and industry competitive positive, among other factors" (p.9). They indicate that parameters followed by one country may not be helpful for other countries owing to the dissimilarities in the nomenclature of industry size, policy regime, skills, and opportunities.

GCC countries with diverse cultures may contribute to creative industries – this sector will contribute to developing the nation's economy. Considering its importance, this study examines the factors that drive creative sectors in GCC countries.

Prominently, these factors include a proxy of financial openness, mobile banking, internet technology, GDP growth, interest rates, and inflation – to be hypothesized for analyzing their effect on the trade of creative industries.

### 3. Methodology and data

Based on contemporary portfolio theory, this research examines the nexus between the behavior towards the performance of CIs of a respective country and its performance using the capital asset pricing model [CAPM] (Markowitz 1959; Sharpe 1964; Lintner 1965). In earlier studies (Mumtaz and Yoshino, 2021; Markowitz, 1959), the pricing model has given investors a way to evaluate the trade-off between risk and return and determine whether high returns justify the riskier assets. The trade-off between risk and return of every risky asset is computed using a market index. According to Markowitz, the standard deviation gauges the entire risk. In the Sharpe-Lintner model, the beta coefficient determines the market-based risk, often known as the systematic risk. This reflects the average sensitivity of risky assets to overall market volatility. This study employs a CAPM to estimate the risk-return relationship (Gouvea and Vora, 2015), which is called the single index model (SIM) and is mathematically presented as follows:

$$R_{i,t} = \alpha_0 + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (1)$$

where  $R_{i,t}$  denotes the return of exports of creative industries in country  $i$  at time  $t$ ,  $R_{m,t}$  refers to the return of benchmark index  $m$  at time  $t$  which is a proxy of total world exports of creative industries, and  $\varepsilon_{i,t}$  is the error term.  $\beta_i$  is the slope coefficient that gauges the exports variability of creative industries. The other statistical models are not considered as the data availability provides the provision to use the Markowitz model to examine the sensitivity of creative industries in terms of global exports of creative industries.

Sharpe and Treynor ratios are also estimated to evaluate the sensitivity and exports performance of creative industries. Sharpe (1964, 1966) suggests the reward-to-variability ratio, which is determined by the additional returns and variations of returns. The Sharpe ratio is estimated as follows:

$$\text{Sharpe ratio} = \frac{(\bar{R}_i - \bar{R}_f)}{\sigma_i} \quad (2)$$

where  $\bar{R}_i$  shows the average returns for country  $i$  or portfolio,  $\bar{R}_f$  indicates the average risk-free return and  $\sigma_i$  is standard deviation. Assuming risk-free rate is zero, the Sharpe ratio can be reflected as:

$$\text{Sharpe ratio} = \frac{\bar{R}_i}{\sigma_i}$$

Another measure of the reward-to-variability ratio is Treynor ratio, which shows the mix of additional returns and the systematic risk (Treynor, 1965). The equation can be expressed as:

$$\text{Treynor ratio} = \frac{(\bar{R}_i - \bar{R}_f)}{\beta_i} \quad (3)$$

This study also investigates the factors that drive the trade of creative industries in GCC countries. Many drivers influence creative industries; however, this study suggests the following model to test hypotheses:

$$\begin{aligned} \text{Trade} - \text{Creative Industries}_{it} &= \psi_0 \\ &+ \psi_1 \text{Trade} \\ &- \text{Creative Industries}_{it-1} \\ &+ \psi_2 \text{GDP Growth}_{it} + \psi_3 \text{FDI}_{it} \\ &+ \psi_4 \text{Mobile Technology}_{it} \\ &+ \psi_5 \text{Internet Technology}_{it} \\ &+ \psi_6 \frac{\text{R\&D expenditures}_{it}}{\text{GDP}_{it}} \\ &+ \psi_7 \text{Interest}_{it} \\ &+ \psi_8 \text{Inflation}_{it} \\ &+ \varepsilon_{i,t} \end{aligned} \quad (4)$$

where  $\text{Trade} - \text{Creative Industries}_{it}$  = [exports + imports] of creative industries,  $\text{GDP Growth}_{it}$  is the growth of gross of domestic product,  $\text{FDI}_{it}$  is the financial development index. This index is a proxy of financial openness which ranges between one and zero. An index around 1 indicates a higher level of openness.  $\text{Mobile Technology}_{it}$  refers to mobile cellular subscriptions.  $\text{Internet Technology}_{it}$  is a fixed broadband subscription.  $\frac{\text{R\&D expenditures}_{it}}{\text{GDP}_{it}}$  is the proportion of R&D expenses to GDP.  $\text{Interest}_{it}$  shows the real interest rate and  $\text{Inflation}_{it}$  is the increase in price level. The data relating to trade in creative industries and FDI are gathered from the

UNCTAD and IMF websites. However, the data of the other variables are obtained from the World Development Indicators.

## 4. Results

### 4.1 Analyses of exports of creative industries

This section presents the analyses for exports of creative industries of six GCC countries (Table 1). The exports of creative industries are divided into four segments, and the results for 2002, 2006, 2010, 2014, 2018, and 2023 are reported.

Panel A shows the exports of advertising and marketing research. On average, the exports of this category of creative industries had increased from \$0.468 million in 2002 to \$172.637 million in 2023. This indicates the mean compound annual growth rate (CAGR) of 30.82% in 22 years. Saudi Arabia had the highest advertising and marketing research exports from 2002 to 2010, while the UAE had the highest from 2014 to 2023. However, Oman and Qatar had the lowest exports in this category of creative industries. A substantial surge in standard deviation over the sample period shows the considerable export variation among sample countries to estimate the variability of exports. This study employs the coefficient of variations (CV), and the results demonstrate that CV increased from 0.926 in 2002 to 2.089 in 2023 (indicating an increase of 126%).

Panel B presents the exports of the second category of creative industries, i.e., architectural, engineering, and technical services. In this classification, on average, the exports had surged from \$17.693 million in 2002 to \$87.245 million in 2023. The mean value of CAGR is 7.55% for 22 years. The results show that Saudi Arabia had the highest exports of this category of creative industries in 2002, 2006, and 2010, while in the rest of the years, the UAE had the highest exports across GCC countries. In contrast, Bahrain, Qatar, and Oman had the lowest architectural, engineering, and technical services exports in selected years. Interestingly, the variability of exports declined from 2.016 in 2002 to 1.751 in 2023.

**Table 1: Analyses of exports of creative industries using summary statistics (\$ million)**

	Year					
	2002	2006	2010	2014	2018	2023
<b>Panel A: Advertising and Market Research</b>						
Mean	0.468	0.225	1.341	121.813	134.537	172.637

Std. Dev.	0.434	0.116	2.473	287.628	319.559	360.573
CV	0.926	0.513	1.845	2.361	2.375	2.089
Median	0.274	0.216	0.361	1.145	3.012	7.202
Highest	1.009	0.368	5.756	708.724	786.749	902.653
Country	Saudi Arabia	Saudi Arabia	Saudi Arabia	UAE	UAE	UAE
Lowest	0.094	0.100	0.037	0.031	0.039	0.209
Country	Oman	Qatar	Qatar	Oman	Qatar	Qatar
Skewness	0.563	0.196	2.216	2.446	2.448	2.365
Kurtosis	-2.822	-2.302	4.931	5.985	5.994	5.647
Countries	5	5	5	6	6	6
<b>Panel B: Architectural, Engineering and Technical Services</b>						
Mean	17.693	39.271	27.446	65.872	70.105	87.245
Std. Dev.	35.666	83.955	58.889	113.541	122.397	152.762
CV	2.016	2.138	2.146	1.724	1.746	1.751
Median	0.848	0.345	0.827	3.338	2.281	3.064
Highest	81.382	189.382	132.767	281.177	303.333	379.444
Country	Saudi Arabia	Saudi Arabia	Saudi Arabia	UAE	UAE	UAE
Lowest	0.052	0.135	0.094	0.127	0.002	0.098
Country	Bahrain	Qatar	Qatar	Oman	Qatar	Qatar
Skewness	2.217	2.232	2.234	1.844	1.876	1.901
Kurtosis	4.928	4.980	4.991	3.098	3.264	3.397
Countries	5	5	5	6	6	6
<b>Panel C: Creative Research and Development</b>						
Mean	1.566	4.846	5.118	42.055	72.848	91.224
Std. Dev.	2.452	6.213	8.592	87.101	162.289	200.128
CV	1.512	1.282	1.679	2.071	2.228	2.194
Median	0.422	2.131	1.338	3.759	2.869	3.344
Highest	5.873	15.618	20.432	219.116	403.499	498.540
Country	Saudi Arabia	Saudi Arabia	Saudi Arabia	UAE	UAE	UAE
Lowest	0.00034	0.456	0.343	0.324	0.012	0.023
Country	Kuwait	Bahrain	Qatar	Qatar	Qatar	Qatar
Skewness	2.047	1.921	2.196	2.406	2.429	2.418
Kurtosis	4.257	3.770	4.855	5.823	5.920	5.874
Countries	5	5	5	6	6	6
<b>Panel D: Personal, Cultural, and Recreational Services</b>						
Mean	1.519	9.246	2.155	67.098	103.579	120.607
Std. Dev.	1.816	17.846	3.365	151.162	241.135	277.337
CV	1.195	1.930	1.562	2.253	2.328	2.300
Median	0.474	1.435	0.589	2.833	2.088	2.637
Highest	4.295	41.113	8.117	375.319	595.534	686.194
Country	Saudi Arabia	Saudi Arabia	Saudi Arabia	UAE	UAE	UAE
Lowest	0.153	0.085	0.162	0.156	0.027	0.270
Country	Qatar	Qatar	Qatar	Oman	Qatar	Qatar
Skewness	1.137	2.216	2.133	2.438	2.444	2.439
Kurtosis	-0.231	4.928	4.605	5.954	5.978	5.961
Countries	5	5	5	6	6	6
<b>Panel E: All Classifications</b>						
Mean	54.062	124.869	168.168	2761.051	2805.602	3692.102
Std. Dev.	83.080	222.338	239.782	5956.234	6138.376	7679.216
CV	1.537	1.781	1.426	2.157	2.188	2.080
Median	20.693	20.984	80.166	419.622	340.828	393.463
Highest	202.478	521.253	589.740	14905.621	15322.606	19302.476
Country	Saudi Arabia	Saudi Arabia	Saudi Arabia	UAE	UAE	UAE
Lowest	10.182	7.622	4.643	22.199	0.925	5.835

Country	Qatar	Qatar	Qatar	Oman	Qatar	Qatar
Skewness	2.221	2.199	2.049	2.437	2.438	2.406
Kurtosis	4.947	4.861	4.332	5.953	5.957	5.823
Countries	5	5	5	6	6	6

Notes: This table presents the analyses of exports of creative industries in GCC countries. CV is the coefficient of variation.

Panel C exhibits the exports of creative research and development for selected years. On average, the exports surged from \$1.566 million in 2002 to \$91.224 million in 2023, with a mean CAGR value of 20.29%. This category followed the same patterns, showing that Saudi Arabia had the highest exports in 2002, 2006, and 2010, whereas UAE had the highest in the remaining selected years. On the other hand, Kuwait, Bahrain, and Qatar had the lowest exports in selected years. The CV increased from 1.512 in 2002 to 2.194 in 2023.

Panel D reports the exports of the fourth category of creative industries, i.e., personal, cultural, and recreational services. The exports, on average, increased from \$1.519 million in 2002 to \$120.607 million in 2023 (mean CAGR is 22%). As per the findings, initially, Saudi Arabia had the highest exports while UAE had the highest in the remaining years of this kind of creative industry. However, Qatar and Oman had the lowest exports in selected years. The CV inflated from 1.195 to 2.300.

Panel E demonstrates the cumulative exports of all categories of creative industries. Over the 22 years, the mean CAGR is 21.17%, indicating a handsome increase in exports' value. The total exports of creative sectors in GCC countries were \$54.062 million in 2002, which increased to \$3,692.102 million in 2023. This study finds that Saudi Arabia had the highest exports of creative industries in 2002, 2006, and 2010, while the UAE had the highest in 2014, 2018, and 2023. In 2023, the UAE contributed 87% of exports of creative industries among GCC countries. Alternatively, Qatar and Oman had the lowest exports of creative industries in selected years. A considerable change in the standard deviation reflects the variations in the exports of creative industries in GCC countries. The CV increased from 1.537 in 2002 to 2.080 in 2023.

#### 4.2 Country-wise analysis of single-index model

This section utilizes the slope coefficient of a single index model to analyze the sensitivity of

exports of creative industries relative to the variability in world trade. The values of beta and intercept are obtained using a simple linear regression. In addition, Sharpe and Treynor ratios are also estimated to determine the performance of creative sectors. Table 2 demonstrates the results of all measures and the portfolio. The results report that the beta coefficients of four countries (Bahrain, Kuwait, Saudi Arabia, and UAE) are positive, and two (Kuwait and Oman) are negative. In the analysis, all the betas are statistically insignificant. The overall portfolio beta is positive and statistically significant at a 1% level, which endorses the sensitivity of creative industries exports among GCC countries due to the variability of global trade.

Sharpe and Treynor ratios are estimated to extend the analysis and find how creative industries behave over the sample period. The Sharpe ratio measures the volatility of risk per unit, while the Treynor ratio gauges the return by unit of risk using systematic risk. The results indicate that Saudi Arabia has the highest Sharpe ratio (0.3388), while Qatar has the lowest Sharpe ratio (-0.0151). The evidence suggests that Saudi Arabia yielded the best returns over the period under review. Oppositely, Qatar has the lowest returns. The portfolio Sharpe ratio is 0.2280, which is more than that of Kuwait, Oman, and Qatar. This evidence indicates the diversification effect, which elaborates on the rise in the sensitivity of the returns of creative industries' aggregate exports. UAE has the highest Treynor ratio (0.6438), whereas Oman has the lowest Treynor ratio (-0.0623). The formation of the Treynor ratio is based on systematic risk, which illustrates that higher risk adversely influences creative industries' exports. The portfolio Treynor ratio is 0.0467, explaining that the additional returns per unit of risk counterweigh the returns. The positive values of Sharpe and Treynor ratios show positive returns attained by sample countries relating to the exports of creative industries and vice versa.

Table 2: Country-wise analysis of single-index model

No.	Country	Intercept	Beta	Sharpe Ratio	Treynor Ratio
1	Bahrain	0.1564 (0.1329)	0.3010 (1.3010)	0.3355	0.5773
2	Kuwait	-0.0127 (0.0851)	1.0153 (0.7236)	0.1319	0.0452
3	Oman	0.1846 (0.1697)	-1.5382 (1.4439)	0.1410	-0.0623
4	Qatar	0.2591 (0.4303)	-4.9515 (3.6605)	-0.0151	0.0054
5	Saudi Arabia	0.0642 (0.0784)	0.7354 (0.6672)	0.3388	0.1450
6	UAE	0.0375 (0.0341)	0.0639 (0.2902)	0.3095	0.6438
	Portfolio	0.0501*** (0.0092)	0.9404*** (0.0754)	0.2280	0.0467

Notes: This table shows the results of the single-index model, Sharpe and Treynor ratios. Standard errors are reported in parenthesis. \*\*\* shows the statistical significance at the 1% level.

**Fig. 1:** Performance Ratios of GCC countries

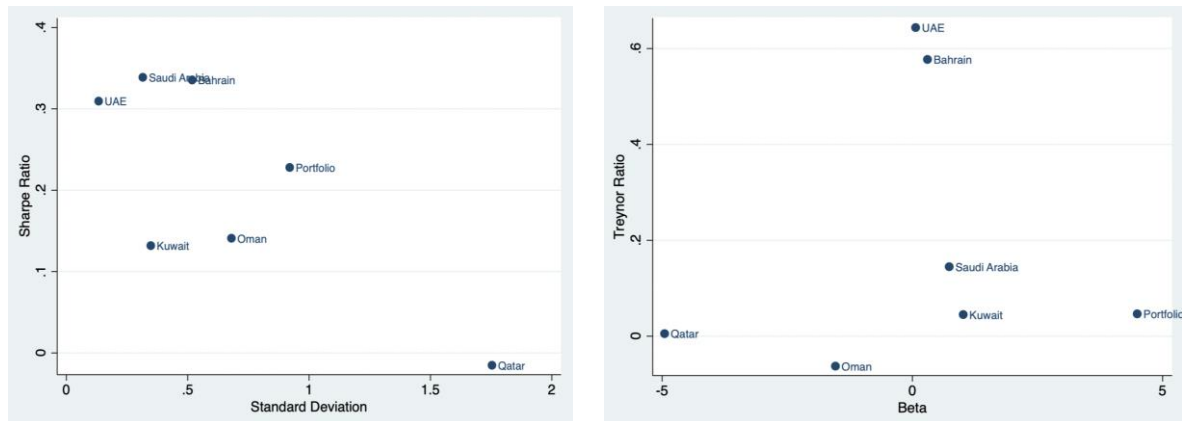


Figure 1 displays the performance of Sharpe and Treynor ratios of GCC countries and portfolios. Estimating both performance measures is different; thus, they report different results. In the Sharpe ratio, per unit risk is assessed using volatility, while unit per risk is measured by beta for the Treynor ratio. Results report that Saudi and Bahrain have the highest Sharpe ratios and Qatar has the lowest. This evidence suggests that an increase in returns of exports of creative industries enhances export sensitivity. Regarding the Treynor ratio, the UAE was the lead exporter of creative industries during the sample period, while Oman had the lowest exports. This implies that the higher magnitude of risk adversely influences creative industries' export performance.

### 4.3 Descriptive statistics

Table 2 presents the descriptive statistics of six GCC countries from 2002 to 2023. The trade of creative industries is measured in natural logarithm form, and the mean value is 7.10. The maximum and minimum values of creative industries trade are 10.81 and 2.57. A large dispersion in trade of creative industries indicates a considerable variation among sample countries. On average, the GDP growth rate is 4.25%. Maximum and minimum values of GDP growth are 26.17% and -7.08%. FDI is a measure of financial openness. The mean value of FDI is 0.441, with a standard deviation of 0.068. Mobile and internet technologies are measured in natural logarithm forms. On average, mobile subscriptions are 15.42 with a standard deviation of 1.28. The mean value of internet subscriptions is

12.08. The maximum and minimum values of internet subscriptions are 16.49 and 4.58 – a vast difference shows that internet connectivity has substantially increased over time. Results report that, on average, R&D expenditure to GDP is 0.363 times, demonstrating that a lower portion of GDP is spent on research and development activities. The mean

interest rate is 2.80%, with a standard deviation of 14.18%. Inflation is another important factor that contributes to the promotion of creative industries. The analysis shows that, on average, inflation is 2.57%, and the maximum and minimum values range between 43.18% and -4.86%.

**Table 3: Descriptive statistics**

Variable	Obs.	Mean	Median	Maximum	Minimum	Std. Dev.
Trade – Creative Industries	123	7.100	7.023	10.806	2.565	1.617
GDP growth	132	4.245	3.807	26.170	-7.076	5.115
FDI	132	0.441	0.443	0.586	0.276	0.068
Mobile technology	132	15.417	15.375	17.804	12.494	1.283
Internet technology	132	12.081	12.152	16.490	4.575	2.173
R&D expenditures/GDP	62	0.363	0.190	1.495	0.042	0.380
Interest rate (%)	75	2.796	-0.718	43.178	-19.469	14.180
Inflation (%)	126	2.568	2.250	15.050	-4.863	3.106

Notes: This table presents the results of descriptive statistics of variables.

#### 4.4 Diagnostic testing

First, the data stationarity is tested using a panel unit root test to determine the factors that drive creative industries. Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS) tests are employed to test the hypothesis (Lee, 2005). Table 4 exhibits the results of panel unit root tests. The results of the LLC test show that all the variables are significant at the level except inflation. In contrast, the IPS test indicates

that R&D expenditure to GDP is only an insignificant variable. Owing to a small sample, panel cross-section is not applicable as cross-sections are less than the time dimensions ( $N < T$ ). This study applies the feasible generalized least square (FGLS) method to estimate the hypotheses and overcome the problems of heteroskedasticity and autocorrelation (Mumtaz and Smith, 2019).

**Table 4: Panel unit root tests**

Variable	Levin-Lin-Chu (LLC) test		Im-Pesaran-Shin (IPS) test	
	Level	First difference	Level	First difference
Trade – Creative Industries	-6.646***	-4.790***	-2.951***	-6.596***
GDP growth	-3.753***	-7.967***	-3.171***	-9.194***
FDI	-1.818**	-3.261***	-3.240***	-4.714***
Mobile technology	-6.561***	-4.217***	-4.540***	-6.404***
Internet technology	-4.811***	-3.412***	-4.732***	-3.342***
R&D expenditures/GDP	-1.517*	-4.674***	-0.239	-2.376***
Interest rate (%)	-5.168***	-7.488***	-3.595***	-6.308***
Inflation (%)	-0.746	-5.406***	-2.349***	-6.283***

Notes: This table presents the results of the panel unit root. \*\*\*, \*\*, and \* show significance at 1, 5, and 10% levels respectively.

#### 4.5 Factors drive creative industries in GCC countries

Table 5 presents the results of factors of creative industries in GCC countries. In Model 1, the

effect of lagged creative industries and GDP growth are determined by the trade of creative industries. The results indicate that the coefficient of lagged creative industries is positive and statistically

significant at a 1% level, which illustrates that the exports of creative industries follow the previous year's patterns of creative industries (Mumtaz and Smith, 2022). This study finds that GDP growth does not affect creative industries in GCC countries. The probable reason for this finding is a minute contribution of creative industries to GDP, which cannot be seen from the findings. However, in the future, a surge in the activities of creative industries may contribute to GDP and influence economic activities.

To examine the impact of financial openness and digitalization, this study incorporates the financial development index and mobile & internet technologies in Model 2. The result reports that the coefficient of lagged creative industries is statistically significant; however, its coefficient has considerably decreased by including other parameters. The coefficient of financial openness is positive and significantly influences the activities of creative industries in GCC countries. This evidence implies that when countries emphasize financial openness by providing easy access to financial services, it helps promote creative industries. This study finds that mobile technology significantly influences trade in creative industries (Mumtaz and Smith, 2022). However, internet technology is an insignificant determinant in the analysis. This indicates that internet technology does not affect the promotion of trade-related activities. It can be inferred that internet technology may not influence due to the small magnitude of trade in creative industries. Over time, when creative industries flourish, we may hope that internet technology may be one of the prominent factors that can help boost economic activities.

In Model 3, R&D expenditures to GDP, interest rate, and inflation are added along with other factors in Model 2 to determine the effect of creative industries. The lagged creative industries are statistically significant, but its coefficient is more diluted than Models 1 and 2. The coefficient of GDP growth is significant, which illustrates that a 5.3% increase in creative industries trade enhances GDP growth by 1%. This interesting finding demonstrates that creative industries participate in GDP in GCC countries in the presence of all parameters. Results report that FDI positively increases the activities of creative industries. This shows that financial openness simplifies financial procedures, which will help promote creative industries in the country. The coefficient of mobile technology is positive and significantly affects creative industries. Mobile technology has created ease in connecting firms, and using mobile networks, they can find new players and complete their deals. On the other hand, internet technology does not impact creative industries in the analysis. Interest rate is an essential factor that can be utilized to enhance creative industries. As per the findings, interest rates do not cause creative industries in GCC countries. The economic activities can also be determined because of inflation in the country. However, inflation does not affect creative industries. Lastly, this study reports that R&D expenditure to GDP is an insignificant variable. Generally, higher expenditures on research and development allow firms to develop and explore avenues to bring innovation that can help diversify business activities. Governments are required to allocate research and development funds so firms can take benefits and support to flourish creative industries activities in their countries.

**Table 5: Drivers of creative industries in GCC countries**

	(1)		(2)		(3)	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
Trade – Creative Industries <sub>t-1</sub>	0.867***	0.048	0.583***	0.074	0.193**	0.088
GDP growth	0.011	0.015	0.009	0.014	0.053***	0.017
FDI			2.399**	1.179	5.053***	1.414
Mobile technology			0.330***	0.112	0.752***	0.172
Internet technology			0.065	0.067	0.018	0.096
R&D expenditures/GDP					0.434	0.541
Interest rate (%)					-0.006	0.005
Inflation (%)					0.059	0.041
Constant	0.971***	0.372	-4.027***	1.323	-8.238***	2.607
Wald chi2(8)	343.59***		443.41***		58.85***	
p-value	0.000		0.000		0.000	

Notes: This table presents the drivers of creative industries. \*\*\*, and \*\* show significance at 1, and 5% levels respectively.

#### **4.6 Country-wise analysis: Factors drive creative industries**

This study examines the country-wise analysis of the factors that drive creative industries using the ordinary least square (OLS) method to extend the analysis. In Model 1, this study estimates the factors that cause creative industries in Bahrain. However, this study reports that all variables are insignificant, given that no variable influences the creative industries in Bahrain. To promote and enhance the activities of creative industries, the government may provide some incentives for this sector so operating firms can get an enabling environment to compete and flourish. Model 2 also demonstrates that all variables regarding creative industries in Kuwait are insignificant. This sector has a lot of potential to grow; thus, the Kuwaiti government may identify the available opportunities and market them to firms so they can benefit. The concessional financing rate also helps firms start or expand their business ventures. Likewise, this study finds that all variables are statistically insignificant, which illustrates that no factor causes creative industries in Oman empirically (Model 3). It can be inferred that the size of creative industries in GCC countries is relatively small. The government of Oman may develop an exclusive fund for creative industries where all existing and prospective firms may benefit in terms of facilitation of exports, marketing, financing, and possible opportunities.

Model 4 reports that lagged creative industries, mobile & internet technologies, and inflation are the significant predictors of creative industries in Qatar. The coefficient of lagged creative industries is positive, which illustrates that the creative industries

trade follows the previous year's trend. Mobile technology is directly associated with the trade of creative industries. This implies that a 1% increase in mobile technology will lead to a 5.14% increase in creative industries. This finding indicates that growth in mobile subscriptions will help firms enhance creative industries' activities. This study also finds that internet technology positively influences creative industries, suggesting that firms use the internet to help them identify new partners contributing towards creative sectors. The coefficient of inflation is positive, highlighting that inflationary activities will boost the trade of creative industries. However, the rest of the variables are insignificant.

In Model 5, lagged creative industries and internet technology are significant drivers of creative industries in Saudi Arabia. This shows that the trade of creative industries follows the prior year's pattern. An increase in internet subscriptions contributes to creative industries. This finding illustrates that Saudi firms use internet technology, which helps to identify new avenues regarding financing, opportunities, marketing, and networking. Over the last few years, there has been a substantial increase in the trade of creative industries in the United Arab Emirates. However, this study reports that no single variable empirically impacts creative industries in the UAE. Besides, many other factors may increase the activities of creative industries. The government can play an important role in formulating a consortium of creative industry firms where they can join hands for better exploration of opportunities and joint ventures, which will eventually help to increase the trading of creative industries.

**Table 6: Country-wise analysis: Drivers of creative industries**

	(1)	(2)	(3)	(4)	(5)	(6)
	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Trade – Creative Industries <sub>t-1</sub>	0.220 (0.490)	0.124 (0.333)	0.428 (0.365)	0.597** (0.209)	0.499* (0.242)	0.111 (0.444)
GDP growth	0.080 (0.354)	0.090 (0.053)	0.017 (0.021)	0.038 (0.035)	0.029** (0.008)	0.034 (0.038)
FDI	13.611 (12.939)	1.218 (3.520)	16.709 (14.345)	1.505 (5.301)	0.995 (0.818)	1.941 (2.769)
Mobile technology	2.206 (2.504)	0.715 (0.537)	4.922 (2.410)	5.144** (1.750)	0.083 (0.145)	0.365 (1.022)
Internet technology	0.097 (1.043)	0.885 (0.943)	0.939 (0.658)	2.052* (1.084)	0.150* (0.067)	0.339 (0.227)
R&D expenditures/GDP		2.073 (2.318)	0.487 (0.283)		-0.014 (0.130)	
Interest rate (%)	-0.003 (0.057)	-0.002 (0.014)	0.015 (0.018)	0.011 (0.010)		
Inflation (%)	0.020 (0.505)	0.103 (0.076)	0.233 (0.291)	0.227*** (0.048)	-0.004 (0.021)	-0.002 (0.042)
Constant	-0.177 (0.228)	-0.140 (0.057)	-0.725 (0.384)	-0.405** (0.148)	0.812 (1.948)	-0.029 (0.132)
Adj. r-squared	0.457	0.476	0.699	0.693	0.975	0.423

Notes: This table demonstrates the country-wise analysis of factors that drive creative industries. \*\*\*, \*\*, and \* show significance at 1, 5, and 10% levels respectively.

## 5. Conclusion and policy implications

Creative industries play a crucial role and contribute toward economic development. In line with this argument, this study examines how creative industries behave and what factors drive them in GCC countries. The first objective of the study is to analyze the export performance from 2002 to 2023. This study finds that the UAE was the leading contributor to exports of creative industries, followed by Saudi Arabia. However, other countries are putting their best efforts into improving the volume of exports.

This study uses the Markowitz model and employs a single-index model to examine the performance of creative industries. Additionally, Sharpe and Treynor ratios are calculated to assess export performance. The results show that the beta coefficients of all GCC countries are not significant, but the overall portfolio is statistically significant. This indicates that the export performance of creative industries in GCC countries is sensitive to global trade fluctuations. As per the Sharpe ratio findings, Saudi Arabia yielded the highest returns, and Qatar obtained the lowest returns over the sample period. In contrast, UAE has the highest Treynor ratio, indicating that higher risk adversely influences exports of creative industries whereas Oman has the lowest Treynor ratio.

The other objective of this study is to examine the factors that cause trade of creative industries in GCC countries. After testing the stationarity of data, this study applies the FGLS technique to test the hypotheses and find that (i) the lagged trade of creative industries follows the previous year's trend, (ii) a surge in trading of creative industries positively contributes to GDP growth, and (iii) the use of mobile and internet technologies enhances the trading activities of creative industries. This study also determines the country-wise analysis of the factors that influence the trading of creative industries and finds the variation in determinants across GCC countries.

Based on the above findings, this study suggests the following implications:

- a) The trade volume of creative industries in GCC countries is currently low. The government must develop a strategic plan to boost this sector and offer incentives to increase trading activities. These measures will attract new players to enter the creative industries and capitalize on unexplored opportunities.
- b) The spending on research and development in creative industries is very low in GCC countries. The government must allocate a certain proportion of funds exclusively for utilizing creative industries. The government also devises a plan for allocating funds to firms for spending on research and development, which will help

explore new dimensions in creative industries. As a result, this sector will contribute to the country's economic growth.

- c) A consortium of creative industries in GCC countries could be established to identify opportunities and promote them to enhance trade within the region.
- d) Financing can play a vital role in supporting and promoting creative industries. The financial institutions may provide funds at a concessionary rate so that firms can get cheaper funds and expand the activities of creative industries. This incentive will also attract new firms to explore their businesses in this sector. Increased focus on financial transparency will also facilitate collaboration between buyers and sellers in the digital creative industries.
- e) The government may set up a center for "creative industries" in one of the state universities. The center will act as a hub and creative linkages between exporters and importers of creative industries. This center will also allow researchers to conduct studies on creative industries and identify the pros and cons of each category. Based on their findings, the problems can be overcome to promote creative industries in the respective country.
- f) The government must set up a vocational institute to develop and refine workers' skills in creative industries. This long-term strategy will help produce skilled workers to enhance the trading of creative industries.

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