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Creative trade's effect on a few macroeconomic factors in China

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Abstract

Creative trade has witnessed significant development in the last years of the twentieth century, occupying a large portion of the global trade balance due to the significant development in innovation and the advancement of talent and knowledge. Its share has reached 3% of global GDP, with creative sectors growing significantly in some countries. Creative trade has also achieved significant growth, leading to increased EG rates in these countries. Using ARDL model, the study attempts to examine how China's creative commerce has developed and how it affects investment and EG. This model utilizes data on creative exports and imports, GDP, and investment for the Chinese economy. Of the several findings of the study, the most significant is that China's creative trade balance has been in surplus over the analysis period. It also demonstrates the long-term equilibrium between private investment and growth, as well as between imports and innovative exports. Additionally, in the long run, exports and revenues have a positive impact on China's economy.

Keywords: Orange economy, creative trade, creative exports, creative imports, economic growth (EG), private investment, Economic growth (GE).

1. Introduction

The GE, or orange economy, has seen significant growth in recent decades, combining economics and creativity. The orange economy growth has been reflected in increased average of EG and development as a result of the growth of industry and trade in creative goods around the world, which have begun to constitute significant proportions in the global trade balance, in addition to their percentage exceeding 3% of the global GDP. Several factors have influenced creative sectors growth, namely innovation, technological development, and the development of knowledge and talent in various fields, including handicrafts, design, and music, software, and rest sciences. The development of the creative sectors has led to increased productivity and, consequently, an increase in the production of creative goods, which began to flow across borders as creative exports, which have developed significantly in most countries, including China, which has also achieved positive growth throughout the research period in creative trade. The value of creative exports reached its highest value in 2021, exceeding $58 billion, constituting 1.76% of total exports for the same year. Creative imports also reached their highest rate in 2021, exceeding $14 billion. Thus, the trade balance achieved a surplus exceeding $43 billion, despite the health quarantine measures due to the Corona outbreak. However, E-commerce contributed to clear growth.

The research aims to respond to the following queries:

1. Does China's private investment and EG depend on creative trade?
2. How much of an impact does creative commerce have on investment and EG, and does this influence last over time?

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1.1. The GE concept

GE concept is a relatively modern concept, its roots dating back to the 1980s. However, its clear understanding did not mature until 2001, when John Howkin introduced it. He defined it as an economy that relies on innovation and the promotion of marketable and sustainable products based on unlimited intellectual capital, talent, and knowledge stimulation [1]. It is also defined as an economy based on individual creativity, skill, and talent capable of creating wealth through the exploitation of creativity [2]. The GE is a major driver of global and regional EG. Despite being among the sectors hose most impacted by the COVID-19 outbreak and impacted by challenges of a rapidly evolving environment, it generates annual revenues of approximately US$2.3 trillion globally, making up almost 3.1% of the world's gross domestic product. At the core of this thriving economy are the cultural and creative sectors, which convert talented people's innovative cultural ideas into new projects or economic ventures. Since the so-called cultural and creative sectors which include a wide range of sectors like music, art-related sectors, fashion, writing, design, media, and crafts have started to produce EG at a global acceleration rate, the GE and the creative sectors are closely related [3]. Research and development, publishing, television and radio, software, design, cinema, music, gaming, advertising, architecture, arts and performance, crafts, video games, and fashion are among the more thorough divisions of the fundamental sectors of the GE.

According to this viewpoint, the availability of creative human capital that can be developed, modernized, and innovative is fundamental to the creative sectors. The growth of information and technology, which has changed how people think about value and wealth, is connected to the creative sectors. Value now comes from interactive information, connection, computation, and even creative aesthetic value rather than from the traditional manufacturing of products. This has therefore resulted in the establishment of enterprises and initiatives through social media and the internet. Here, developed economies have started to shift from the focus of the manager or organizer to that of the author, customer, or production manager, the relationship between big corporations and small and medium-sized enterprises. The orange economy is another name for the GE. This is the culmination of all the processes that turn concepts into culturally valuable products and services, the worth of which is established by intellectual property. Orange has traditionally been associated with creativity, this hue represents creativity, culture, and thought, but in Western traditions, it represents amusement. The GE and the orange economy are therefore interchangeable and complimentary (Abu Ghazi, 2021: 6). The GE has emerged as a dynamic global engine of change in the modern era, with enormous untapped growth potential. Global GE is expanding quickly, not just in terms of income generation but also in terms of creating jobs and export earnings. Furthermore, because culture-based businesses embody the creative and inventive human energy that makes up nations' wealth in the twenty-first century, most of the world's intellectual and creative resources are invested in these sectors [4].

1.2. GE elements

The creative sectors are a significant and essential component of the broader GE, as stated by Americans for the Arts. The GE's components include:

- Creative Sectors: The creative industry emerged with advent of digital technology, although some of these sectors have ancient historical roots. These sectors produce symbolic goods such as ideas, experiences, and images. They use intellectual capital as primary inputs and focus on heritage, arts, media, and functional innovations. Creative sectors represent a driver of economic knowledge and a facilitator of other sectors and services. They are linked to information technology, publishing, copyright, and the internet. These sectors are widespread in the sectors of transportation, tourism, construction, engineering, finance, and many other fields.
- Creators: The GE revolves around artists, creators, cultural workers, and distinguished creative entrepreneurs who develop and create everything new and innovative and innovate in it.
- Talent developers: Talents must be nurtured, guided, supported, and sometimes even funded. This is where organizations that promote artistic growth, education, talent development, discovery, and creative development come into play [5].

- Participants: All sectors need consumers, and the GE is no different. Participants are the beneficiaries, audience members, and community members who support creative products through their presence, consumption, encouragement, and dissemination. This may be accomplished through creative centers, which are real or ethical places that offer the assistance required for community involvement, project development, and networking in the fields of technology, culture, and the arts.
- Resource managers: Policy makers who may include government agencies, private institutions, public or private entities, investors, and corporations.

They play a prominent role in directing resources that can support creators, talent developers, and creative sectors. Through the elements of the GE, we see that the creative sectors in general are characterized by three basic features [6]:

- They encompass everyone, not just a select few artists and well-trained corporations.
- They can succeed in every area of the economy; they are not limited to just one.
- They can be found anywhere; they are not just in affluent or developed nations.

1.3. Creative commerce, its contents, and the goods traded

Creative commerce is the trade based on cultural, manufactured, and innovative goods and services that make up the GE. As small and medium-sized businesses promote their innovative and intellectual goods, this commerce has expanded dramatically. E-commerce is the main tool used by entrepreneurs for this. Businesses that have a sustainable competitive advantage will benefit in the long run in terms of both their competitive edge over other businesses and their overall performance. E-commerce is becoming a crucial and essential component of competitive advantage [7]. Countries are making more money from creative commerce (products and services), and worldwide exports of creative services outnumber exports of creative goods. The export of software and research and development services has significantly increased in recent years, which have been referred to as the dematerialization of some creative goods. This has resulted in a disparity between the growth of exports of creative goods and the growth of exports of creative services. Two elements are responsible for this: the first is the growth of statistics and statistical monitoring, which has led to the conversion of some products into creative services through digitalization. For services and everything related to them in the last few years [8].

2. A review of previous studies

The study in [9] looked at how many elements, including innovation, intellectual property rights, the establishment of new businesses, and the accessibility of facilities, affected EG in 103 Italian regions between 2001 and 2006. Value added growth and employment growth were examples of regional growth factors that were employed. According to the study, more companies in the creative sectors were shown to have a positive impact on regional job development, according to the study. Employment growth is positively impacted by legal immigration as well. Growth was not significantly impacted by the remaining factors, and value-added growth was not impacted by these variables either. Using cointegration and panel data calculated using the dynamic least squares (DOLS) technique, research [10] aims to measure the relationship between creative exports and EG over the long term in eight Arab countries between 2002 and 2011. The study discovered a long-term correlation between the two variables and a beneficial effect of exports of creative goods on EG.

By concentrating on the connections between the GE and local development on the one hand, and social and regional capital on the other, the study [3] aimed to clarify how the GE and creative sectors are seen as important forces behind local development and economic success. The study found that the performance of creative exports varies significantly among the sample nations, which will be reflected in the performance of creative exports, and that creative commodities contribute to EG. Karasova included an analysis of the growth of Ukraine's creative sectors and their future possibilities, as well as the dynamics of commodity trading in the global trade of creative products [11].

The potential of creative sectors including information technology, architecture, and handicrafts was investigated in this study. The study [12] sought to use a collection of examples to give a broad picture of economic progress in South Tangerang, Indonesia, by utilizing the inventive and creative viewpoint of business owners in the creative industry. The primary engine of commerce, innovation, and job development, the creative industry also promotes environmental sustainability and social and cultural cohesion. The study concluded that creative exports in Indonesia accounted for 6.6% of total non-oil and gas exports in 2014-2015.

Creative sectors in South Tangerang have grown in several areas, including the contribution of creative sectors in South Tangerang to economic development. Therefore, they need to attract investors, the government, and banks. A study by [13] aimed to demonstrate the impact of creative sectors on GDP in 98 developed and developing countries spanning the period 2011-2019. The study used the General Momentum Factor (GMM) method, using a set of independent variables: creative sectors, human capital, investment, government size, inflation, and trade openness. The study demonstrated a positive and significant impact of creative sectors on GDP in the countries studied. It also highlighted the need to support and pay attention to creative sectors and develop appropriate policies to achieve further EG.

Konstantakopoulou's study aimed to demonstrate the impact of creative exports on EG in 71 countries, divided into two categories: developed economies and developing economies, between 2002 and 2021. The results of the study showed that the EG of these countries was positively and statistically significantly impacted by exports of creative goods [15].

3. Methodology

The impact of creative exports and imports on investment and EG in China was measured using World Bank data and UNCTAD statistics, together with data on economic variables (creative exports, creative imports, EG, and private investment) in order to meet the study goal [14-16]. The short- and long-term effects were illustrated using the ARDL model and all of its statistical tests. The following is the typical formula for the two functions:

The first function:

$$\Delta \mathrm{GDP} = c + \lambda \mathrm{GDP}_{t-1} + \beta_1 XCR_{t-1} + \beta_2 \mathrm{ICR}_{t-1} + \sum_{i=1}^{n} a_1 \Delta \mathrm{GDP}_{t-i} + \sum_{i=0}^{m} a_2 \Delta \mathrm{XCR}_{t-i} + \sum_{i=0}^{m} a_3 \Delta \mathrm{ICR}_{t-i} + \mu_t$$

The second function:

$$\Delta \mathrm{INV} = c + \lambda \mathrm{GDP}_{t-1} + \beta_1 XCR_{t-1} + \beta_2 \mathrm{ICR}_{t-1} + \sum_{i=1}^{n} a_1 \Delta \mathrm{GDP}_{t-i} + \sum_{i=0}^{m} a_2 \Delta \mathrm{XCR}_{t-i} + \sum_{i=0}^{m} a_3 \Delta \mathrm{ICR}_{t-i} + \mu_t$$

4. Results and discussion

China's exports reached $325.6 billion in 2002, and between 2003 and 2008, they increased at different rates, according to Table 1. In 2008, exports grew at a pace of 17.23%, but in 2009, the global financial crisis (subprime mortgages) caused exports to drop and achieve negative growth of -16.01 percent. Following that, exports increased at positive rates from 2010 to 2023, except for 2014 and 2015, when they grew at negative rates of -2.94% and -7.73%, respectively. The slowdown in global economic development and the drop in oil prices on the international market were the causes of this dip. With a growth rate of 0.99%, the value of exports reached $3380.03 billion in 2023. China's creative exports, which were worth 6.12 billion dollars in 2002 and accounted for 1.88 percent of all commodity exports, grew remarkably between 2002 and 2023. It continued to grow throughout the period until the value of creative exports in 2023 reached (49.16) billion dollars, and their percentage of creative exports was (1.45%). The highest value witnessed by creative exports was in 2021, when they reached (58.44) billion dollars.

Table 1. Creative exports in China

Year	Export value: ($1 billion)	Growth rate (%)	Value of creative exports (billion dollars)	Creative exports to exports ratio (%)
	1	2	3	4
2002	325.6		6.12	1.88
2003	438.23	34.59	8.32	1.9
2004	593.33	35.39	10.73	1.81
2005	761.95	28.42	13.86	1.82
2006	968.98	27.17	14.07	1.45
2007	1220.46	25.95	18.93	1.55
2008	1430.69	17.23	22.64	1.58
2009	1201.61	-16.01	20.5	1.71
2010	1577.75	31.3	26.3	1.67
2011	1898.38	20.32	31.66	1.67
2012	2048.71	7.92	34.32	1.68
2013	2209.01	7.82	35.38	1.6
2014	2342.29	6.03	37.86	1.62
2015	2273.47	-2.94	37.56	1.65
2016	2097.63	-7.73	35.48	1.69
2017	2263.35	7.9	39.86	1.76
2018	2486.7	9.87	41.4	1.66
2019	2499.46	0.51	47.35	1.89
2020	2589.95	3.62	43.03	1.66
2021	3316.02	28.03	58.44	1.76
2022	3346.83	0.93	54.2	1.62
2023	3380.03	0.99	49.16	1.45

Table 2 shows that the value of Chinese imports in 2002 amounted to $163.48 billion, then witnessed a growth rate of 116.91% in 2003. Chinese imports continued to grow and fluctuate according to the state of global economic activity, reaching a value of $2,556.80 billion in 2023. Creative imports, on the other hand, were $0.37 billion in 2002, representing a percentage of 0.22% of imports. Creative imports continued to grow at a steady pace, reaching $13.85 billion in 2023, representing a percentage of 0.54% of imports. As for the trade balance of creative goods, we note from Table (2) that China achieved a surplus throughout the period 2002-2023. The surplus in 2002 reached $5.76 billion, and continued to achieve a surplus, reaching its highest level in 2021, when the surplus reached $43.56 billion. The surplus in 2023 was $35.31 billion. We conclude from the above that China has achieved remarkable progress in the field of trade in creative goods, and its exports have outperformed its imports of creative goods throughout the research period.

Table 2. Imports and creative imports in China

Year	Imports (billion dollars)	growth rate (%)	Value of creative imports (billion dollars)	Creative imports to imports ratio (%)	Creative goods trade balance (billion dollars)
	1	2	3	4	5
2002	163.48		0.37	0.22	5.76
2003	354.61	116.91	0.45	0.13	7.86
2004	480.72	35.56	0.47	0.1	10.26

Year	Imports	growth rate	Value of creative imports	Creative imports to imports ratio	Creative goods trade balance
	(billion dollars)	(%)	(billion dollars)	(%)	(billion dollars)
	1	2	3	4	5
2005	564.74	17.48	0.54	0.1	13.32
2006	681.97	20.76	0.66	0.1	13.4
2007	819.89	20.22	1.42	0.17	17.51
2008	990.09	20.76	1.69	0.17	20.95
2009	883.61	-10.75	1.85	0.21	18.65
2010	1239.99	40.33	2.54	0.2	23.76
2011	1579.1	27.35	3.44	0.22	28.22
2012	1661.95	5.25	3.75	0.23	30.57
2013	1789.61	7.68	4.28	0.24	31.1
2014	1808.72	1.07	4.39	0.24	33.47
2015	1566.56	-13.39	4.67	0.3	32.9
2016	1500.64	-4.21	4.35	0.29	31.13
2017	1740.27	15.97	5.34	0.31	34.52
2018	2037.37	17.07	6.56	0.32	34.84
2019	1993.65	-2.15	8.13	0.41	39.22
2020	1998.91	0.26	10.56	0.53	32.47
2021	2653.13	32.73	14.88	0.56	43.56
2022	2678.24	0.95	12.79	0.48	41.41
2023	2556.8	-4.53	13.85	0.54	35.31

Table 3 shows the development of GDP and private investment in China. We note that the GDP reached $1,470.56 billion in 2002, then grew in 2003 to reach $1,660.28 billion, with a growth rate of 12.90%. GDP continued to grow at positive but varying rates throughout the period from 2004 to 2023, even in years marked by economic or health crises, particularly in 2020, which witnessed the shutdown of the Chinese economy due to the COVID-19 outbreak. GDP achieved a growth rate of 2.86%, allowing China to maintain a positive growth rate, albeit lower than in other years. In 2023, GDP reached $18,811.64 billion, achieving a growth rate of 5.2%. As for investment in China, Table (3) shows that it reached $531.66 billion in 2002, and witnessed a growth rate of 23.73% in 2003. Investment continued to grow positively throughout 2004-2023, with the exception of 2015, which witnessed a decline in investment with a growth rate of -0.37%. This decline is due to some internal factors related to government reforms toward a shift toward reliance on technological development and the services sector, which was reflected in the slowdown in investment. External factors, however, were the result of the slowdown in the global economy and the decline in oil prices.

Table 3. Development of GDP and investment in China

Year	GDP	growth rate	Investment	growth rate
	(billion dollars)	(%)	(billion dollars)	(%)
	1	2	3	4
2002	1470.56		531.66	
2003	1660.28	12.9	657.81	23.73
2004	1955.35	17.77	818.26	24.39
2005	2285.96	16.91	922.3	12.71
2006	2752.12	20.39	1098.38	19.09

2007	3550.33	29	1437.25	30.85
2008	4594.34	29.41	1941.98	35.12
2009	5101.69	11.04	2313.94	19.15
2010	6087.19	19.32	2833.96	22.47
2011	7551.55	24.06	3523.56	24.33
2012	8532.19	12.99	3944.03	11.93
2013	9570.47	12.17	4440.6	12.59
2014	10475.62	9.46	4800.35	8.1
2015	11061.57	5.59	4782.45	-0.37
2016	11233.31	1.55	4788.92	0.14
2017	12310.49	9.59	5295.15	10.57
2018	13894.91	12.87	6085.06	14.92
2019	14279.97	2.77	6176.24	1.5
2020	14687.74	2.86	6369.59	3.13
2021	17820.46	21.33	7687.8	20.7
2022	17881.78	0.34	7715.32	0.36
2023	18811.64	5.2	7772.38	0.74

For model description and time series stationarity test, GDP= f (XCR, ICR); INV= f (XCR, ICR); Whereas, GDP = Gross Domestic Product, INV = Private Investment, XCR = Creative Exports, ICR = Creative Imports.

Time series data on economic variables in China for the period 2002-2023 were used semi-annually to test the stationarity of the time series using the ADF test and to determine their integration order. The test was conducted, and the results shown in Table 4 were obtained:

Table 4. Unit root test for research variables

	At Level	GDP	INV	XCR	ICR
Cons.	T-Statistic	-0.6909	-2.0921	-2.4925	-2.0762
	Sig.	***0.8371***	***0.2487***	***0.1256***	***0.2550***
		n0	n0	n0	n0
Cons. & Trend	T-Statistic	-2.1974	-3.2643	-2.1637	-2.9563
	Sig.	***0.4774***	***0.0863***	***0.4931***	***0.1584***
		n0	*	n0	n0
Without Cons. & Trend	T-Statistic	-0.767	-1.0707	-3.0787	-1.013
	Sig.	***0.3773***	***0.2520***	***0.0030***	***0.2735***
		n0	n0	***	n0
	At First Difference				
		d(GDP)	d(INV)	d(XCR)	d(ICR)
Cons.	T-Statistic	-6.5092	-6.5738	-5.3335	-4.1289
	Sig.	***0.0000***	***0.0000***	***0.0001***	***0.0027***
		***	***	***	***
Cons. & Trend	T-Statistic	-6.5275	-6.4802	-5.7766	-4.1451
	Sig.	***0.0000***	***0.0000***	***0.0002***	***0.0125***
		***	***	***	**
Without Cons. & Trend	T-Statistic	-6.5848	-6.5827	-2.4084	-4.201
	Sig.	***0.0000***	***0.0000***	***0.0175***	***0.0001***
		***	***	**	***

Regardless of whether there was a categorical variable, a categorical variable and a general trend, both, or neither, Table (4) demonstrates that the time series of the variables (GDP, INV, and ICR) were non-stationary at the 5% level. Regardless of whether there was a general trend, a categorical variable, or none at all, (XCR) remained Cons. at the 5% significant level. At degree (0) I, the variable would be integrated. As a result, initial differences will be used to rerun the test. Whether there was a categorical variable, a categorical variable and a general trend, both, or none, the test revealed that all variables were stable at the 5% and 1% levels, and the series would be integrated at degree I(1). To illustrate the immediate and long-term impacts of creative trade factors on macroeconomic variables, we shall employ the ARDL model. The ARDL model for the GDP function was estimated, and the results shown in Table 5 were obtained.

Table 5. Results of the ARDL model for the GDP function

Variable	Coeff.	STD.	T-Statistic	Sig.*
GDP(-1)	0.602506	0.083816	7.188416	0
XCR	0.113829	0.029615	3.843668	0.0004
ICR	0.044766	0.0182	2.459749	0.0186
C	0.254747	0.677589	0.375961	0.709
R-sq.	0.76561	Mean dependent var		6.59881
Adjusted R-sq.	0.747106	S.D. dependent var		4.3135
S.E. of regression	2.169198	AIC		4.476985
Sum squared resid	178.806	Schw.		4.642478
Log likelihood	-90.01669	HQQ		4.537645
F-statistic	41.37436	DW		2.164282
Prob (F-statistic)	0			

The GDP function estimation results are displayed in Table (5). The model's explanatory power, or R2, was 0.76, which indicates that 76% of the changes in GDP can be explained by the variables in the model, with the remaining 24% coming from other variables that were left out. The adjusted R-sq. value was 74%. Regarding the overall significance of the model, it was significant since the value of the F-statistic was 41.37, which is significant at the 5% level, and it was less than 5%. As a result, we accept the alternative hypothesis and reject the null hypothesis. The Akaike criteria indicated that the lag was (1, 0, 0) in the optimum lag test for the estimated model displayed in Figure (1).

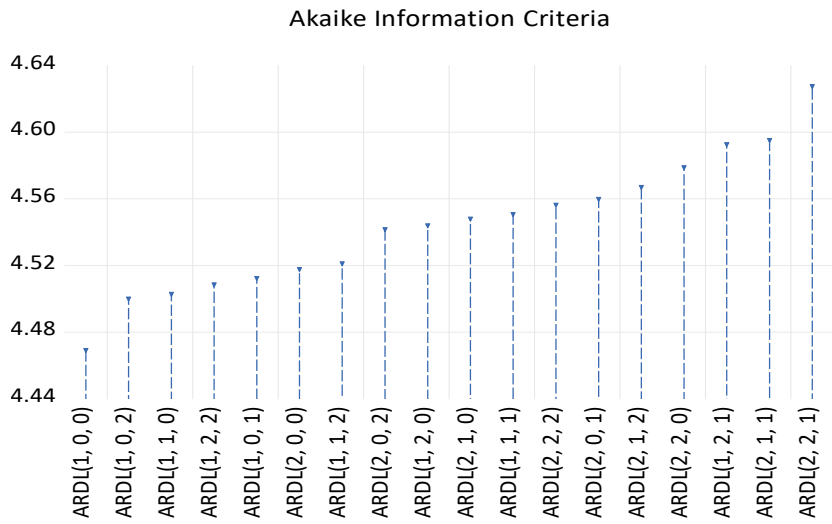

Figure 1. The GDP function's optimal lag in the estimated model

To illustrate the degree of a long-term equilibrium link between the variables of the estimated model, a limits test for the GDP function was performed. The results are displayed in Table (6).

Table 6. Bounds test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Sig.	I(0)	I(1)
F-statistic	12.69182	10%	2.63	3.35
K	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

At the 5% significance level of 3.87, the F-statistic value was 12.69, as seen in Table 5, which is higher than the top table value. This suggests that the model variables have a long-term equilibrium connection. The alternative hypothesis, which asserts the existence of a long-term equilibrium connection, is thus accepted and the null hypothesis is rejected. The estimated model is tested using the Breusch-Godfrey Autocorrelation Correlation (LM) Test in Table 7 to make sure it is not affected by Autocorrelation correlation. Based on the Prob value, which was higher than 5%, we may conclude that the F and Chi-Square values were not significant at the 5% significance threshold. At the 5% level, the F and Chi-Square values were not significant, according to the Heteroscedasticity Test, which is displayed in Table 7. Consequently, we reject the alternative hypothesis and accept the null hypothesis.

Table 6. Autocorrelation correlation test

Breusch-Godfrey Autocorrelation Correlation LM Test:			
Null hypothesis: No Autocorrelation correlation at up to 1 lag			
F-statistic	0.567976	Sig. F(1,37)	0.4558
Obs*R-sq.	0.634983	Sig. Chi-Square(1)	0.4255

Table 7. Test of heterogeneity of variance

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.4205	Sig. F(3,38)	0.2518
Obs*R-sq.	4.235131	Sig. Chi-Square(3)	0.2372
Scaled explained SS	4.239924	Sig. Chi-Square(3)	0.2367

The model's normal distribution test results are displayed in Figure 2. This indicates that the residuals will be normally distributed based on the value of (prob), which was more than 5%, and that the value of (Jarque-Bera) (1.4373), at a significance level of 5%, was not significant.

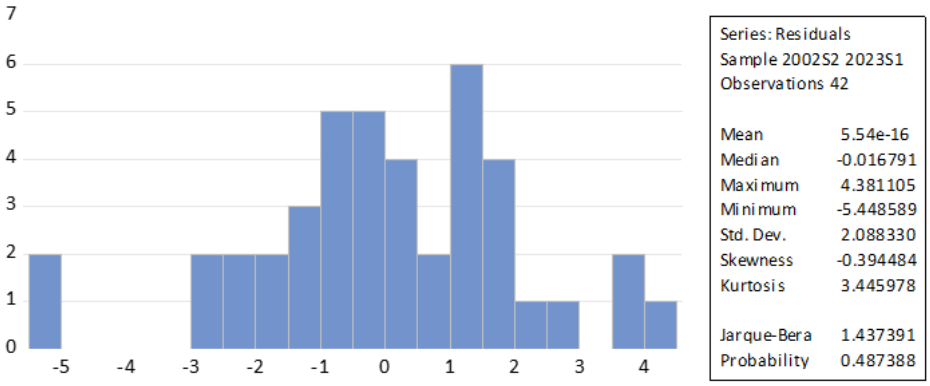

Figure 2. Test of normal distribution of residuals

The calculated model's structural test is shown in Figure 3. We see that, at a significance level of 5%, the value of the cumulative sum of residuals (CUSUM) test displayed in Part A fell inside the critical limits, indicating short-term stability of the calculated parameters. The cumulative sum of squares (CUSUM) test, as shown in

Part B, was within the critical limitations at the 5% level, with the exception of one point. Thus, the predicted model is likewise stable.

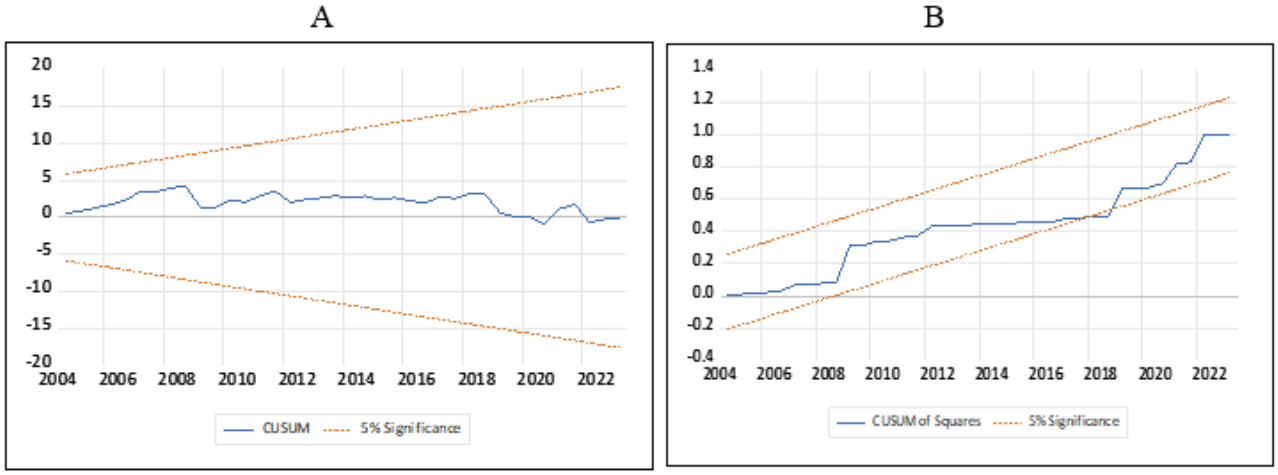

Figure 3. Structural stability test

The findings in Table 8 demonstrate that the error correction parameter was negative (-0.39) and significant at the 5% level based on the Prob value. This indicates that 39% of mistakes are adjusted toward the long-run equilibrium value in the same time, with the remaining proportion being adjusted in later periods. In other words, it takes around a year and three months to achieve long-term balance.

Table 8. Error correction model for the GDP function

ECM Regression				
Case 2: Restricted Cons. and No Trend				
Variable	Coeff.	STD.	T-Statistic	Sig.
CointEq(-1)*	-0.397494	0.053708	-7.401028	0
R-sq.	0.571266	Mean dependent var		-0.122619
Adjusted R-sq.	0.571266	S.D. dependent var		3.189373
S.E. of regression	2.08833	AIC		4.334128
Sum squared resid	178.806	Schw.		4.375501
Log likelihood	-90.01669	HQQ		4.349293
DW	2.164282			

The long-term association is demonstrated by the data in Table (9). Because (prob t) is less than 5%, we may conclude that the variable (XCR) has a direct association with GDP and is significant at the 5% level based on the t-test. This indicates that, in line with economic theory, a 1% rise in creative exports resulted in a 0.57% increase in GDP. EG is directly correlated with creative imports (ICR), which are significant at the 5% level. This means that a 1% increase in creative imports results in a 0.11% rise in growth. Economic theory does not support this. Nonetheless, innovative imports, particularly those involving technology, can boost prosperity in China. Given that the Chinese economy is capable of creating creative items that can compete with imports, these imports also help to boost local production of creative goods and investment in that production. Increased exports and resulting EG are the results of all of this. Thus, in the long run, creative commerce directly affects China's EG. The ARDL model for the INV function was estimated, and the results shown in Table (10) were obtained.

Table 9. Long-term relationship of the GDP function

Levels Equation				
Case 2: Restricted Cons. and No Trend				
Variable	Coeff.	STD.	T-Statistic	Sig.
XCR	0.286367	0.088470	3.236900	0.0025
ICR	0.112622	0.049294	2.284706	0.0280
C	0.640884	1.614025	0.397072	0.6935
EC = GDP - (0.2864*XCR + 0.1126*ICR + 0.6409)				

Table 10. ARDL model results for the INV function

Variable	Coeff.	STD.	T-Statistic	Sig.*
INV(-1)	0.988456	0.147303	6.710341	0
INV(-2)	-0.259254	0.136201	-1.903469	0.0655
XCR	0.138987	0.05691	2.442217	0.0199
ICR	0.021561	0.039439	0.546696	0.5882
ICR(-1)	0.063179	0.040988	1.541411	0.1325
C	0.366441	1.171071	0.312911	0.7563
R-sq.	0.893592	Mean dependent var		14.4825
Adjusted R-sq.	0.877944	S.D. dependent var		9.886481
S.E. of regression	3.45399	AIC		5.454418
Sum squared resid	405.6215	Schw.		5.70775
Log likelihood	-103.0884	HQQ		5.546015
F-statistic	57.10517	DW		1.929164
Prob(F-statistic)	0			

The INV function estimation findings are displayed in Table (10) with an R2 of 0.89, meaning that 89% of the changes in investment can be explained by the factors in the model, with the remaining proportion (11) coming from additional variables not in the model. The adjusted R-sq. value was 87%. Regarding the model's significance, if it was significant, the F-statistic value was 57.10, which is significant at the 5% level. If the Prob(F-statistic) value was less than 5%, the alternative hypothesis would be accepted and the null hypothesis would be rejected. Regarding the optimal lag test for the estimated model in Figure 4, it was discovered that, in accordance with Akaike's criteria, the model's optimal lag was (2, 0, 1).

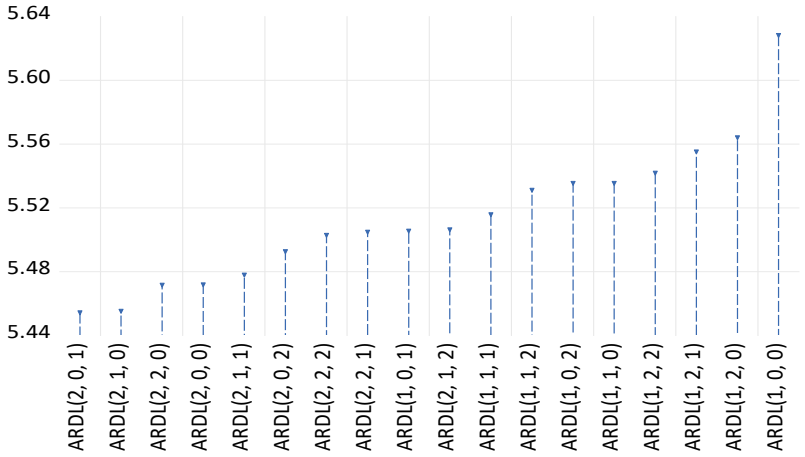

Figure 4. Optimal lag of the estimated model for the INV function

After conducting the bounds test for the INV function to determine the extent of the existence of a long-term equilibrium relationship between the variables of the estimated model, the results shown in Table (11) were obtained.

Table 11. Bounds test for the INV function

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	8.079165	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Table 11 shows that the F-statistic value was 8.079, which is greater than the upper table value at the 5% significance level of 3.87. This indicates a long-term equilibrium relationship between the variables in the estimated model. Therefore, we reject the null hypothesis and accept the alternative hypothesis, which states the existence of a long-term equilibrium relationship.

Table 12 shows the results of testing the estimated model to ensure it is free of the Autocorrelation correlation problem using the Breusch-Godfrey Autocorrelation Correlation (LM) Test. From this, we note that the F and Chi-Square values were insignificant at the 5% significance level, based on the Prob value, which was greater than 5%. Table 13 shows the Heteroscedasticity Test, from which we note that the F and Chi-Square values were insignificant at the 5% level. Therefore, we accept the null hypothesis and reject the alternative hypothesis.

Table 12. Autocorrelation correlation test

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	8.079165	10%	2.63	3.35
K	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Table 13. Test of heterogeneity of variance

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoskedasticity			
F-statistic	0.675872	Sig. F(5,34)	0.6446
Obs*R-sq.	3.616284	Sig. Chi-Square(5)	0.6059
Scaled explained SS	2.959549	Sig. Chi-Square(5)	0.7062

Figure 5 shows the results of the normal distribution test for the model. From this, we note that the value of (Jarque-Bera) (0.3242) was not significant at a significance level of 5%, and according to the value of (prob), which was greater than 5%, the residuals will be normally distributed.

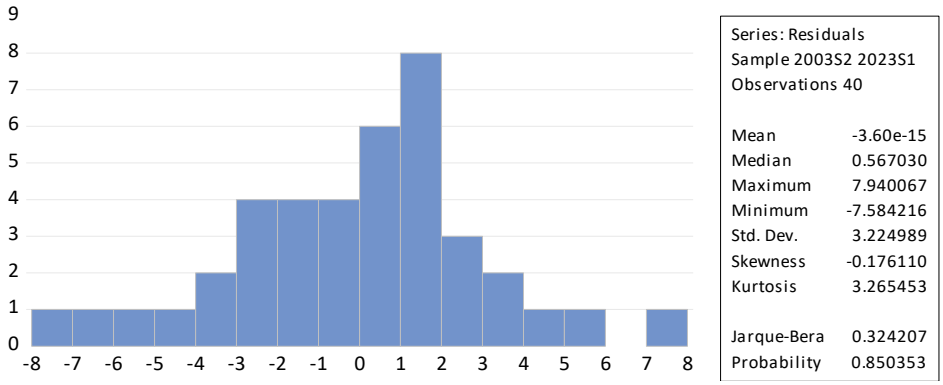

Figure 5. Normal distribution test of residuals

Figure 6 illustrates the structural test of the estimated model. We note that the value of the cumulative sum of residuals (CUSUM) test shown in Part A falls within the critical limits at a 5% significance level. This means

that the estimated parameters are stable in the short term. Part B illustrates the cumulative sum of squares (CUSUM) test. It was within the critical limits at the 5% level, except for one point that fell within the critical limits. This means that the estimated model is also stable in both the short and long term.

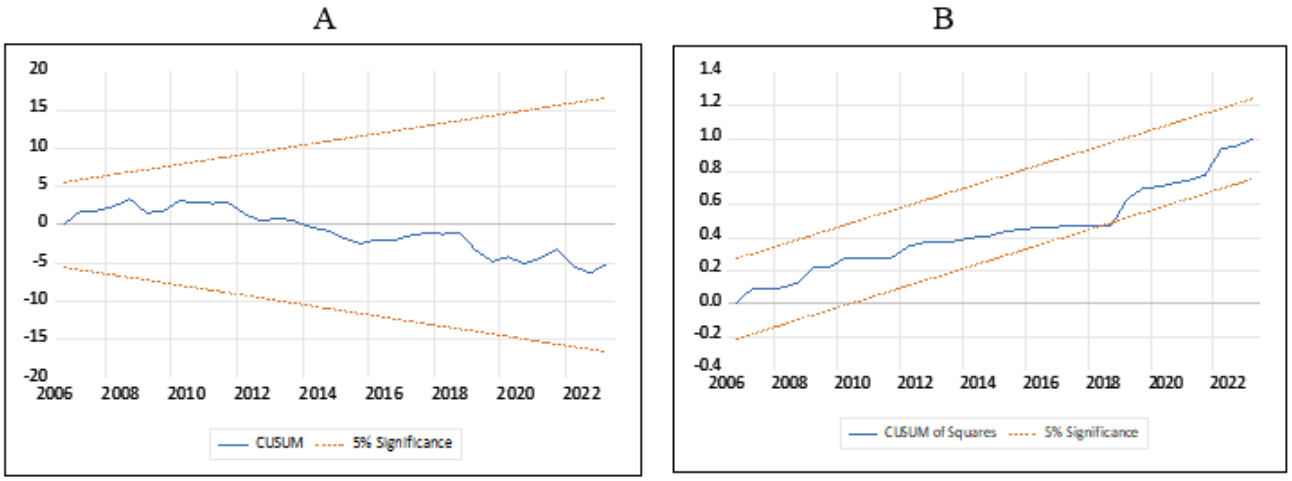

Figure 6. Structural stability test

The results of Table 14 show that investment in the previous period is directly related to investment in the current period at the 5% level. This means that a 1% increase in investment in the previous period leads to a 0.25% increase in current investment, which is consistent with economic theory. The error correction parameter was also significant at the 5% level, according to the Prob value, and negative at (-0.27). This means that 27% of errors are corrected in the same period toward the long-term equilibrium value, and the remaining percentage is corrected in subsequent periods. This means that the period required to reach long-term equilibrium is approximately less than two years.

Table 14. Error correction model for investment function

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INV(-1))	0.259254	0.118749	2.183215	0.0360
D(ICR)	0.021561	0.032975	0.653864	0.5176
CointEq(-1)*	-0.270799	0.045664	-5.930272	0.0000
R-squared	0.581663	Mean dependent var		-0.428750
Adjusted R-squared	0.559050	S.D. dependent var		4.986146
S.E. of regression	3.311004	Akaike info criterion		5.304418
Sum squared resid	405.6215	Schwarz criterion		5.431084
Log likelihood	-103.0884	Hannan-Quinn criter.		5.350217
Durbin-Watson stat	1.929164			

The results of Table 15 illustrate the long-term relationship. From this, we note that the variable "creative exports" (XCR) has a direct relationship with "investment" (INV) and is significant at the 5% level according to the t-test, as "prob t" is less than 5%. This means that a 1% increase in "creative exports" (XCR) leads to a growth in "investment" (INV) of 0.51%, which is consistent with economic theory. Creative imports (ICR) have a direct relationship with "investment" (INV) and are significant at the 5% level. This means that a 1% increase in "creative imports" leads to a 0.31% increase in investment growth. This is contrary to economic theory. However, in China, creative imports can contribute to stimulating investment, particularly in the production of creative goods, given the Chinese economy's capabilities in producing creative goods that compete with

imported goods. The Chinese economy places great emphasis on innovation and creativity, which in turn leads to investment growth. Therefore, creative trade has a direct impact on investment in China in the long term.

Table 15. The long-term relationship of the INV function

Levels Equation				
Case 2: Restricted Cons. and No Trend				
Variable	Coeff.	STD.	T-Statistic	Sig.
XCR	0.513247	0.21543	2.382431	0.0229
ICR	0.312925	0.141011	2.219151	0.0333
C	1.353187	4.116487	0.328724	0.7444
EC = INV - (0.5132*XCR + 0.3129*ICR + 1.3532)				

From the above, it is clear that creative trade has achieved continuous growth during the research period in China. This is similar to what most leading countries in the creative industry have witnessed, as it has contributed to increased job opportunities in the creative industry, as indicated by the study [12]. The findings also show a long-term correlation between private investment in China, EG, and creative exports and imports. This aligns with the study's conclusions [10]. Regarding the impact of creative exports, their effect in China was positive on both investment and EG. This is consistent with the findings of several studies, which have shown that the impact of creative exports on EG is positive [13],[15].

5. Conclusions

- GE and creative trade have established a prominent place in the global economy and have played a role in propelling EG globally and in China specifically.
- The value of creative goods exports has surpassed $50 billion in some years, demonstrating the Chinese economy's ability to produce notable surpluses in the trade balance for these commodities.
- The results of the econometric model indicate that creative exports have a direct impact on EG and private investment in the long term.
- In 2021, as the COVID-19 breakout expanded, creative trade both imports and exports saw its fastest growth rates. That year, the growing importance of e-commerce helped to achieve this notable expansion.

Declaration of competing interest

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

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Author contribution

Khudhair Abbas Hussein Al Waeli: Conceptualized the study, developed the research framework, and conducted the literature review. She was responsible for drafting the initial manuscript and coordinating revisions. Salam Kazem Shani: Contributed to methodology design and data analysis. She provided critical insights into the application of activity costing in outsourcing decisions and helped refine the manuscript. Sultan Jasem Sultan, Ali Omran Hussein: Assisted in data collection and interpretation. He contributed to the discussion on sustainable value and its implications for outsourcing decisions, as well as editing the final manuscript for clarity and coherence.

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