

Cultural Capital and China's Economic Growth

Hongxia Xing¹, Jianyu Chi^{2*}

¹*China Environmental United Certification Center, Beijing, China*

²*School of Economics and Management, Communication University of China, Beijing, China*

**corresponding author*

Keywords: cultural capital, economic growth, dominance analysis

Abstract: Cultural capital is a special capital, which may have an important impact on economic growth. We use China's provincial panel data from 2009 to 2018 to verify the impact of cultural capital on China's economic growth. And we use the method of dominance analysis to explore the relative contributions of physical capital, human capital, and cultural capital to economic growth. The main conclusions of this article are followed: cultural capital has a significant positive impact on China's economic growth, and the relative importance of cultural capital is higher than human capital.

1. Introduction

In addition to factors such as physical capital and human capital that have been confirmed by literature to have a significant impact on economic development, cultural capital as an influencing factor of economic growth cannot be ignored. With the expansion of the economics research and the development and improvement of econometric technology, cultural capital has gradually entered the economics research.

The research on the influence of cultural capital on economic growth should be carried out along the following lines: firstly, clarify what cultural capital is, secondly, clarify how cultural capital is measured, and finally discuss how cultural capital affects economic growth.

Bourdieu (1986) first proposed the theory of cultural capital. He combined the characteristics of culture and put forward the theory of cultural capital in the sociological system [1]. Cultural capital mainly gains value appreciation through educational investment. From the perspective of human development, cultural capital refers to the cultural adaptability embodied in the process of people's use of material resources, such as moral ethics, religion, etc. [2]. Throsby (1999) believed that cultural capital is different from human capital, physical capital, and natural capital [3]. It is the fourth type of capital that promotes economic growth. It has both cultural and economic value. Tangible and intangible cultural capital is distinguished from two perspectives. Tangible cultural capital is embodied in architecture, design, cultural sites, works of art, etc., while intangible cultural capital refers to the culture embodied invisibly in experience, tradition, values, beliefs, and ideas. capital. Tubadji and Nijkamp (2015) believe that cultural capital is the life attitude of most residents in a region, their propensity to risks, and their ability to accept opportunities and challenges [4].

The selection of cultural capital measurement indicators and the construction of an evaluation system are the basis and key to the empirical research on the impact of cultural capital on economic

growth. From the cultural evaluation system to the measurement indicators of cultural capital, it shows the continuous improvement of quantitative research.

The United Nations Educational, Scientific and Cultural Organization and the New Zealand government have proposed cultural evaluation indicators, but culture is different from cultural capital and cannot be used as a criterion for measuring cultural capital. At the same time, the availability of data is also insufficient.

A lot of literature has demonstrated the important role of culture in promoting economic growth. Scholars have measured cultural capital and incorporated it into empirical analysis affecting economic development. And they have achieved many results that can be used for reference. Based on the endogenous growth model, Bucci and Segre (2011) introduced cultural capital and human capital as two independent variables that affect economic growth for analysis [5]. They believe that cultural capital is of great significance to technological progress and has an impact on human capital. There are complementary effects in the process of economic growth.

Bucci, Sacco, and Segre (2014) further expanded the study of the endogenous economic growth model and believed that the positive effect of cultural capital accumulation on economic growth is not obvious when the accumulation of cultural capital is at a low level [6]. Although the discussion on the concepts of cultural capital is rich, so far, a unified definition of cultural capital has not been made. The most widely accepted definitions in research are mainly sociological and economic definitions [7]. On the whole, we believe that cultural capital is the accumulation of the cultural value of the fruits of human labor concretely expressed in the form of wealth, and is the sum of cultural resources including cultural products, cultural capabilities and cultural institutions.

Based on the above concepts, in the theoretical analysis part of this article, cultural capital is divided into three aspects for measurement. Cultural products, including cultural income per capita, the total income of institutions affiliated to the cultural and cultural relics department, cultural facilities per capita investment in fixed assets in culture and related industries, and cultural employment as the percentage of total employment in culture, education, and entertainment industries; cultural capabilities, including Cultural education means the average number of years of education per capita, cultural consumption means per capita expenditure on culture, education and entertainment consumption, cultural exchange means per capita number of art performances; cultural system, including cultural support means per capita financial appropriation support for cultural institutions, cultural relic management means cultural relics per 10,000 people The number of personnel in protection management institutions and cultural popularization are the number of employees in cultural institutions per 10,000 people.

As some measurement indicators cannot be quantified, the empirical part of this article selects “the total income of the institutions affiliated to the cultural relics” as the variable to measure cultural capital. Since education, system and other factors have a profound impact on economic activities outside the institutions of the cultural and cultural relics departments, the indicators selected in this article cannot cover the cultural capital outside the institutions of the cultural and cultural relics departments. Therefore, the empirical part of this article will underestimate culture. The effect of capital on economic growth.

Some literature has proved that in addition to factors such as physical capital and human capital, cultural capital has become an important factor affecting economic growth. This paper incorporates cultural capital into the endogenous economic growth model, and selects panel data from 2009 to 2018 in all provinces of China for empirical research.

2. The Mechanism of Cultural Capital Affecting Growth

Cultural capital plays a role in the output of both cultural and non-cultural sectors. Starting from the definition of cultural capital in this article, this section discusses in turn the mechanism of product cultural capital, physicalized cultural capital, and institutionalized cultural capital to promote economic growth.

The cultural capital of the product is first reflected in the degree of development of cultural-related industries in the region. In 2004, the National Bureau of Statistics of China first defined the cultural industry as activities that provide cultural and entertainment products and services to the public, and a collection of activities related to these activities. From the perspective of the production process of the cultural industry, cultural capital with material carriers and cultural connotations directly enters the process of cultural industry production as a means of production, and guides the adjustment and optimization of the regional economic structure through penetration, demonstration and integration effects. The flow of cultural capital directly affects the growth of the aggregate economy. The greater the added value of the cultural industry, the greater the amount of human, material and financial resources used in the cultural industry in the economy, and the greater the proportion of cultural capital in the economy. Second, the fixed asset investment of cultural institutions is used for the construction of cultural infrastructure in the region. The degree of perfection of cultural infrastructure reflects the preservation of cultural capital in the region. Cultural employment is closely related to the added value of the cultural industry. The consumption of cultural products and cultural services is included in a region through the market price of products or services. In the economic development of China, the more labor force employed in the culture, education and entertainment industries, the more developed the cultural industry in the region, the more cultural products produced or cultural-related services provided, the greater the contribution to economic development.

Physicalized cultural capital reflects the degree to which residents are subtly influenced by the cultural environment of the region. This aspect of cultural capital usually includes people's values, beliefs, views, and ways of thinking, and the accumulation of these cultural capitals will improve people's management and organization and coordination capabilities, help people use and allocate resources more rationally, and promote economic development. The way is shifted towards a more efficient direction, thereby promoting economic growth. Education enables the gradual accumulation of cultural abilities of members of society, the creation of cultural products or corporate innovation, and the accumulation of human capital to promote economic growth. From an individual point of view, the consumption of cultural products or services can be regarded as residents' investment in their own cultural capital. For example, a movie fan has a consumption when watching a movie, and the fee he pays for watching the movie can be regarded as a payment for the cultural influence he has gained through watching the movie. Therefore, residents' consumption in culture, education and entertainment can be regarded as the accumulation of the physical of cultural capital. The larger the proportion of cultural, education, and entertainment consumption expenditures in total household expenditures, the greater the role of cultural capital in promoting the economy.

Institutionalized cultural capital contributes to the rational and healthy development of cultural industries and other industries, thereby promoting economic growth. The formation and evolution of systems in various countries and regions are affected by local cultural traditions, customs, and moral concepts. Therefore, institutionalized cultural capital is reflected in all aspects of economic life. Division of labor and specialized production is one of the important reasons for promoting a country's economic growth. The government's financial allocation to cultural institutions reflects the local government's emphasis on cultural industries and cultural undertakings. Regions with sufficient financial support have more sufficient cultural industry development funds, and the

production of cultural products or the provision of labor services can be carried out more smoothly. Cultural management agencies and cultural market inspection agencies supervise the healthy development of the cultural industry, ensuring that enterprises and institutions in the economy carry out production and operation activities in an orderly manner, so that their final products are beneficial to economic growth. From the internal point of view of the enterprise, internal reward and punishment systems are often formulated to restrain and motivate employees.

In summary, product cultural capital, physicalized cultural capital, and institutionalized cultural capital all play a significant role in economic growth.

3. Model and Data

3.1 Model

According to the classical growth theory and the new growth theory, we introduce physical capital, human capital, and labor into the econometric model to examine the impact of main factors on economic development. This paper constructs the following equation:

$$rategdp_{it} = \beta_0 + \beta_1 rategk_{it} + \beta_2 ratehe_{it} + \beta_3 rategc_{it} + \beta_4 ratemncy_{it} + \beta_5 control_{it} + \varepsilon_{it} \quad (1)$$

where i represents the provinces of China, and t represents the year; the explained variable $rategdp$ is GDP growth rate, $rategk$ is the physical capital growth rate, $ratehe$ is the human capital growth rate, $rategc$ is the cultural capital growth rate, and $ratemncy$ is employment growth rate, $control$ is the control variable set, including the proportion of urban population, the growth rate of the patent applications approved, the proportion of FDI in GDP, and ε is error term.

If China's production function is constant return to scale, then we can get equation (2):

$$growth_{it} = \beta_0 + \beta_1 g_k_{it} + \beta_2 ratehe_{it} + \beta_3 rategc_{it} + \beta_4 control_{it} + \varepsilon_{it} \quad (2)$$

In equation (2), the dependent variable is the growth rate of GDP per worker ($growth$), g_k is the growth rate of physical capital per worker, $ratehe$ is the growth rate of human capital, $rategc$ is the growth rate of cultural capital per worker, and $control$ is the control variable set as in equation (1).

3.2 Data

This paper selects the panel data of 30 provinces, except Tibet from 2009 to 2018. The time span of the econometric analysis sample is 2010-2018. Unless otherwise specified, all data in this article comes from the China Statistical Yearbook and the statistical yearbooks of provinces in China. The following is the usage of the main variables.

The actual total output growth rate ($growth$). We use the GDP data of various provinces and cities published by the National Bureau of Statistics. Taking 2009 as the base year, the nominal GDP is based on the CPI and the impact of price changes is removed, and the actual GDP growth rate of China's provinces over the years is calculated based on the adjusted actual GDP.

The growth rate of cultural capital stock ($rategc$). We use the perpetual inventory method to estimate the stock of cultural capital. The cultural capital stock of each province in the base year (2009) is calculated according to the following formula:

$$gc_{i,2009} = G_{i,2009} / (g_i + \delta^c) \quad (3)$$

In the formula, $gc_{i,2009}$ represents the cultural capital stock of province i in 2009. Taking into account the availability of data, we use the total income of the cultural and cultural relics department as the approximate value of the total income of the cultural industry. The data comes from Statistical Yearbook of Chinese Culture and Cultural Relics. $G_{i,2009}$ represents the total income of the cultural and cultural relics department of the province in 2009, g_i represents the geometric average growth rate of the total income of the cultural and cultural relics department of Province i from 2009 to 2018, and δ^c is cultural capital The depreciation rate is $\delta^c=0.2$. After obtaining the cultural capital

stock of each province in 2009 according to the above formula, obtain the cultural capital stock of the remaining years according to the following formula:

$$gc_{it} = gc_{i,(t-1)} \cdot (1 - \delta^c) + G_{it} \quad (4)$$

After obtaining the cultural capital stock of each province over the years, the growth rate of the cultural capital stock of each province over the years is calculated.

The growth rate of physical capital (*rategk*). We use fixed asset investment as the basis for measuring physical capital. After the annual fixed asset investment price index has been deflated, we calculate the physical capital stock of China's provinces over the years based on 2009. We set the physical capital depreciation rate to 0.1096, use the perpetual inventory method to estimate the capital stock, and then find the growth rate.

Human capital growth rate (*ratehe*). We refer to the measurement method of Hall and Jones (1999), combines the rate of return on education with the average years of education, and obtains the human capital after considering the rate of return on education [8]. The calculation formula is shown in equation (5):

$$he(s_i) = \begin{cases} r_1 s_i, s \leq 6 \\ r_1 * 6 + r_2 (s_i - 6), 6 < s \leq 12 \\ r_1 * 6 + r_2 * 6 + r_3 (s_i - 12), s \geq 12 \end{cases} \quad (5)$$

where, s_i is the average years of education per capita in each province; r_1 , r_2 , and r_3 are the rates of return to education at the primary, secondary, and higher education stages, respectively. Their values are set to $r_1=0.18$, $r_2=0.134$, $r_3=0.151$. The average years of education per capita is the ratio of the total years of education of all employed persons to the total population. The length of primary school graduation is 6 years, the length of junior high school graduation is 9 years, the length of high school graduation is 12 years, and the college graduation is 16 years. The data comes from the website of the National Bureau of Statistics and statistical yearbooks of various provinces.

Employment growth rate (*ratenmcy*). The classical growth theory and the new growth theory have verified the influence of labor on economic growth, and the labor factor is the most basic factor of economic growth. We select the year-end employment growth rate of the major industries to reflect the employment growth rate.

The proportion of urban population (*rateczrk*). The urban-rural structure is represented by the ratio of urban population to total population. In the process of urbanization in China, various elements of the countryside have gradually realized the agglomeration of various elements in the city, and the reconfiguration of various elements in space has promoted the rapid accumulation of human capital and physical capital in urban areas, leading to large-scale urban demand, will have a significant effect on the city's future economic growth.

The growth rate of the number of approved patents (*ratezls*). The growth rate of the of patent applications accepted by each province is used to express technological innovation activities. Innovation and technological progress are one of the driving forces of long-term economic growth. In the long run, increasing the output of technological innovation and increasing the intensity of technology introduction are the main ways to promote technological progress in production.

FDI as a percentage of GDP (*ratefdi*). The foreign trade structure is expressed by the ratio of foreign direct investment to GDP. FDI, which carries the world's cutting-edge technologies and advanced management experience, plays an important role in promoting the international diffusion of advanced technologies and promoting the technological progress of the host country.

The descriptive statistics of the main variables are shown in Table 1.

Table 1: Descriptive Statistics

Variable	Mean	P50	Sta dev	Min	Max	Obs
<i>growth</i>	7.411	7.230	6.667	-13.78	55.45	270

<i>rategdp</i>	9.292	8.392	5.587	0.00500	23.92	270
<i>rategk</i>	18.16	18.02	7.312	0.386	36.39	270
<i>g_k</i>	16.31	16.31	8.354	-7.714	60.07	270
<i>ratenmcy</i>	2.040	1.354	2.550	0	19.71	270
<i>ratehe</i>	1.122	0.922	2.215	-5.224	11.48	270
<i>rategc</i>	16.77	15.67	6.160	5.965	39.47	270

4. Results and Discussion

4.1 Baseline Regressions

We first make a preliminary consideration of the relationship between cultural capital and economic growth according to formula (1). The regression results of (1) are shown in Table 2.

For the sake of comparison, column (1) shows the regression results without adding cultural capital and control variables. The dependent variable is real GDP growth rate (*rategdp*), explanatory variables including physical capital growth rate (*rategk*), human capital growth rate (*ratehe*), and labor force growth rate (*ratenmcy*). The regression results show that the two variables, the growth rate of physical capital and the growth rate of human capital, both have an impact on the GDP growth rate at a significant level of 1%. This is consistent with the research results of many scholars, indicating that China's economic growth in recent years has not only benefited from the continuous growth of physical capital, but the contribution of the growth of human capital cannot be ignored. In addition, we noticed that the employment growth rate has a positive relationship with the economic growth rate, but it is not significant. This shows that the dependence of China's economy on labor is gradually weakening, and the increase in employment is not a key factor leading to China's economic growth.

Column (2) of Table 2 shows the regression result of cultural capital growth rate (*rategc*) being added. From the regression results, it is found that the coefficient and significance of the growth rate of physical capital and human capital have not changed significantly, while the coefficient of the growth rate of the cultural capital is positive, and the p-value is less than 0.01, which fully shows the importance of cultural capital.

In the regressions in columns (3) and (4) of Table 2, we have added control variables and time trend term (trend) respectively. These control variables are *rateczrk*, *ratezls* and *ratefdi*. The results show that the coefficient of the growth rate of cultural capital is still positive but has decreased, and the level of significance has also decreased. It is only statistically significant at the 10% level; the coefficient of urban population proportion is negative; the coefficient of the growth rate of the patent applications received is positive. Column (4) adds a time trend term. From the results, the coefficient of cultural capital growth rate is positive but only significant at the level of 10%. Combining the regression results in columns (3) and (4), we make a preliminary analysis that the significant decrease in the coefficient of cultural capital growth rate may be due to the serious multicollinearity between the cultural capital growth rate and related control variables.

Table 2: regression analysis explaining GDP growth rate

	(1) <i>rategdp</i>	(2) <i>rategdp</i>	(3) <i>rategdp</i>	(4) <i>rategdp</i>
<i>rategk</i>	0.537*** (8.74)	0.413*** (4.75)	0.198 (1.53)	0.096 (0.82)
<i>ratehe</i>	0.584*** (4.69)	0.528*** (4.71)	0.463*** (4.84)	0.481*** (5.40)
<i>ratenmcy</i>	0.104	0.096	0.055	0.024

	(0.83)	(0.79)	(0.50)	(0.26)
<i>rategc</i>		0.216*** (3.12)	0.139* (1.94)	0.124* (1.97)
<i>rateczrk</i>			-0.390** (-2.69)	
<i>ratezls</i>			0.037** (2.70)	
<i>ratefdi</i>			0.174 (0.59)	
<i>trend</i>				-0.798*** (-4.70)
Constant	-1.320 (-1.29)	-2.620** (-2.54)	22.973** (2.21)	8.873*** (3.32)
Individual effects	YES	YES	YES	YES
Obs	270	270	270	270
Within R ²	0.266	0.297	0.337	0.349

Note: The explained variable is the GDP growth rate; the numbers in parentheses are t statistics of calculated according to the robust standard error; *, ** and *** represent statistical significance at the levels of 10%, 5%, and 1%, respectively.

According to the regression results in Table 2, the employment growth rate does not have a significant impact on GDP growth rate. This may be due to the current surplus of labor in China, unreasonable labor allocation, and low utilization efficiency. Therefore, we reconsider the topic of this article from the perspective of per worker, which is to regress equation (2). In the formula, each province's GDP is divided by the number of employees to get the GDP per worker, and the growth rate of GDP per worker is used as the dependent variable to examine the impact of cultural capital growth rate on the growth rate of GDP per worker. The explanatory variables include the growth rate of physical capital per worker (*g_k*), the growth rate of human capital (*ratehe*), the growth rate of cultural capital per worker (*rategc*), and a series of control variables. The regression result of equation (2) is shown in Table 3.

Table 3: regression analysis explaining GDP growth rate per worker

	(1) growth	(2) growth	(3) growth	(4) growth	(5) growth
<i>g_k</i>	0.664*** (4.66)	0.605*** (3.35)	0.600** (2.60)	0.546** (2.17)	0.577** (2.41)
<i>ratehe</i>	0.563*** (4.31)	0.505*** (4.43)	0.476*** (4.31)	0.490*** (4.56)	0.486*** (4.45)
<i>rategc</i>		0.185** (2.13)	0.159** (2.23)	0.127** (2.06)	0.143** (2.10)
<i>rateczrk</i>			0.037 (0.17)		0.477* (1.84)
<i>ratezls</i>			0.042*** (3.09)		0.041*** (3.17)
<i>ratefdi</i>			0.914 (1.53)		0.674 (1.10)
<i>trend</i>				-0.275 (-1.00)	-0.677** (-2.12)
Constant	-4.050*	-6.129***	-10.698	-2.792	-30.448*

	(-1.78)	(-2.87)	(-0.67)	(-0.53)	(-1.85)
Obs	270	270	270	270	270
Within R ²	0.360	0.380	0.404	0.387	0.416

Note: The explained variable is the GDP growth rate per worker; the numbers in parentheses are t statistics of calculated according to the robust standard error; *, ** and *** represent statistical significance at the levels of 10%, 5%, and 1%, respectively.

For the sake of comparison, column (1) of Table 3 shows the results of only adding physical capital and human capital to the regression. The coefficients of both are positive and both are significant at the 1% confidence level. This result is consistent with the result of our initial regression (column (1) of Table 2), which further verifies the conclusion that China's physical capital and human capital are important sources of China's economic growth from the per worker perspective. In the regression in column (2) of Table 3, we add the core explanatory variable cultural capital growth rate. The regression results show that the coefficient of cultural capital affecting economic growth is significantly positive, and the p value is less than 0.05. This shows that cultural capital has a significant positive impact on economic growth from the perspective of per worker, and the same conclusion as the previous regression is obtained. In column (3) of Table 3, we have added three control variables: the proportion of urban population, the growth rate of patent applications received, and FDI as a proportion of GDP. It can be found that the coefficient of cultural capital growth rate is still statistically significant at 5% level and the sign is positive. In column (4) of Table 3, we add the time trend term, and in column (5), we consider both the control variables and the trend term. In the regression results of the two columns, the size and significance of the cultural capital growth rate coefficient did not change significantly. This further validates the importance of cultural capital for economic growth.

4.2 Robustness Check

We use the following methods to conduct robustness tests. The specific regression results are shown in Table 4. In the robustness test, we follow the equation (2), that is, the explained variables of the robustness test are the same as those in Table 3. It is GDP growth rate per worker (*growth*).

Table 4: results for robustness check

	(1)Proxy variables	(2)human capital	(3) Reduced sample	(4)dynamic panel	(5)GM M
<i>g_k</i>	0.655*** (3.30)	0.599** (2.57)	0.610*** (2.80)	0.610*** (2.69)	0.599** * (8.03)
<i>ratehe</i>	0.451*** (3.97)	0.470*** (4.36)	0.445*** (4.08)	0.795*** (3.48)	0.464** * (3.20)
<i>g_perzsr</i>	0.049*** (2.96)				
<i>g_pergd</i>	-0.055*** (-4.23)				
<i>rateczrk</i>	-0.049 (-0.24)	0.031 (0.14)	0.102 (0.52)	-0.059 (-0.38)	0.107 (0.77)
<i>ratezls</i>	0.036*** (3.02)	0.041*** (2.94)	0.038*** (2.99)	0.085*** (4.32)	0.041** (2.34)

<i>ratefdi</i>	1.366* (1.92)	0.895 (1.48)	0.627** (2.21)	0.344 (0.67)	0.892** (2.00)
<i>g_hb</i>		-0.031 (-0.63)			
<i>rategc</i>		0.165** (2.29)	0.100 (1.44)	0.328*** (3.18)	0.245** * (2.71)
<i>L.growth</i>				-0.061 (-1.39)	
<i>L2.growth</i>				-0.087** (-2.17)	
Constant	-4.237 (-0.29)	-10.194 (-0.63)	-12.135 (-0.83)	-7.373 (-0.69)	
Obs	270	270	245	210	270
Within R ²	0.466	0.405	0.391		0.401

Note: The explained variable is the GDP growth rate per worker; the numbers in parentheses are t statistics of calculated according to the robust standard error; *, ** and *** represent statistical significance at the levels of 10%, 5%, and 1%, respectively.

In column (1) of Table 4, we use two variables as proxy for the growth rate of cultural capital. One is the growth rate of cultural industry income per capita (*g_perzsr*), and the other is the growth rate of per capita investment in cultural and related industries (*g_pergd*). We use CPI to adjust based on 2009. The regression results show that the coefficients of these two proxy variables are statistically significant at the 1% level. However, it should be noted that the coefficient sign of the per capita income growth rate of cultural industry (*g_perzsr*) is positive, and the sign of the coefficient of per capita cultural and related industries fixed investment growth rate (*g_pergd*) is negative. This shows that the growth of per capita cultural industry income and the growth of per capita cultural and related industry fixed asset investment have a significant impact on economic growth, but as a whole, the direction of cultural capital's impact on economic growth is complex. The positive impact of cultural industry income per capita on the economy is reflected in the gradual increase in the scale of China's cultural industry in recent years.

In column (2) of Table 4, we use more indicators to describe human capital, that is, the growth rate of beds in medical institutions per 10,000 people (*g_hb*). When measuring human capital, health human capital is added. We use beds per 10,000 medical institutions as an indicator to measure health human capital. The regression results of adding healthy human capital show that the growth rate of beds in medical institutions per 10,000 people does not have a significant impact on the economic growth rate. Considering the difference between the number of inpatients and the actual number of patients, and the phenomenon of normal office work during hospitalization. It is believed that the role of the number of beds in medical institutions per 10,000 people in promoting economic growth needs further discussion. At the same time, this shows that the method of increasing the beds in medical institutions to increase the human capital of workers needs to be considered. However, after adding healthy human capital, the coefficient of cultural capital (*rategc*) is still significantly positive, which shows that the positive influence of cultural capital on economic growth is robust.

In column (3), we reduce the sample for testing. We remove the data with negative GDP growth rate per worker, thus reducing the sample size from 270 to 245. According to the regression results,

the coefficient of cultural capital growth rate is still positive, but not significant. This result partially verifies the conclusion of Table 4.

In column (4), we use the dynamic panel model for regression. The considered economic growth in period $t-1$ may be due to inertia affecting the economic growth in period t . Therefore, we take the lag effect into account in the regression model and uses a dynamic panel model to consider the impact of cultural capital. We select the GDP growth rate per worker lagged 1 period of (*L.growth*) and that lagged 2 period (*L2.growth*) to join the regression. The regression results show that *L2.growth* has a positive impact on *.growth*. We believe that the coefficient of cultural capital growth rate is significantly positive at the level of 1%, thus verifying the conclusion that cultural capital has a positive effect on the economic growth.

In column (5), we consider that the growth rate of cultural capital may have a causal relationship with the growth rate of GDP per worker. We use 3 instrumental variables to perform GMM regression. The three instrumental variables are the growth rate of cultural industry income per capita (*g_perzsr*), the growth rate of per capita investment in cultural and related industries (*g_pergd*), and the growth rate of cultural, educational and entertainment services per capita (*g_con_cul*). The regression results also verify the previous conclusion.

4.3 The relative importance of cultural capital

The above process of empirical results explains the fact that the growth rate of physical capital, human capital and cultural capital are all important factors that contribute to economic growth. Then, among the three factors, how much does each factor contribute to the growth rate of GDP per worker?

We use the method of dominance analysis to explore the relative contribution of physical capital, human capital, and cultural capital to economic growth. This analysis method has been widely used in the fields of economics, psychology, and political science (Ye, Ng, & Lian, 2015) [9]. The principle of dominance analysis is to decompose the R^2 obtained by regression to obtain the relative contribution of each explanatory variable. Therefore, this method is also called relative importance analysis (RIA). The essence of this method is to rank the relative importance of each explanatory variable, which requires constant addition of new explanatory variables during regression, and then compare the additional contributions of each variable. This additional contribution can be represented by the increase in R^2 generated by the new regression. We list the results of the dominance analysis in Table 5.

Table 5: dominance analysis results

	(1)	(2)	(3)
relative importance of physical capital	85.11% [1]	68.41% [1]	55.69% [1]
relative importance of human capital	14.89% [2]	12.95% [3]	10.16% [4]
relative importance of cultural capital		18.63% [2]	13.19% [3]
relative importance of control variables			20.96% [2]

Table 5 shows the regression results of the three regressions. The explained variable is the growth rate of GDP per worker (the same as the benchmark regression). In column (1) of Table 5, we only added the growth rate of physical capital and the growth rate of human capital. It shows that the contribution of physical capital growth rate to economic growth far exceeds the contribution of human capital. In column (2), we added the growth rate of cultural capital. It can be found that the relative contribution of the growth rate of physical capital is still the largest, reaching 68.41%. It should be noted that the relative contribution of cultural capital growth rate reached 18.63%, which

was higher than the relative contribution of human capital growth rate. This may be caused by the inefficient use of human capital in China and the low contribution rate of intensive labor industries. This also fully illustrates the importance of cultural capital in China in recent years. In column (3), we added the growth rate of physical capital, human capital, and cultural capital, as well as three control variables. We find that the relative importance of the growth rate of cultural capital still exceeds the growth rate of human capital.

5. Conclusions

Based on the above empirical analysis, we can get the following two conclusions.

Cultural capital has a significant positive impact on China's economic growth. From the perspective of the production process of the cultural industry, cultural capital with material carriers and cultural connotations directly enters the process of cultural industry production as a means of production, and guides the adjustment and optimization of the regional economic structure through penetration, demonstration and integration effects, thereby changing regional development; while education, excellent customs and fine traditions enable members of society to gradually accumulate cultural capabilities, create cultural products or enterprise innovation, and promote economic growth through the accumulation of human capital; institutionalized.

The relative importance of cultural capital is higher than human capital. The empirical results of this paper show that for China's economic growth, the relative importance of physical capital is the strongest, the relative importance of cultural capital is second, and the relative importance of human capital is the weakest. China's economic growth is still driven mainly by physical capital, that is, physical capital is still the most important growth factor. The traditional physical capital and human capital's role in promoting economic growth has gradually weakened. With the accumulation of Chinese cultural capital, the positive role of cultural capital in economic growth has gradually become prominent. The relative importance of human capital is the smallest.

Acknowledgment

We acknowledge the financial support from China Scholarship Council (201807055029), and the Fundamental Research Funds for the Central Universities of Communication University of China (2018CUCTJ022).

References

- [1] Bourdieu, P. (1986) *The forms of capital*. in *Handbook of Theory & Research of for the Sociology of Education*, 280-291.
- [2] Berkes, F., and. Folke, C. (1992) *A systems perspective on the interrelations between natural, human-made and cultural capital*. *Ecological Economics*, 5, 1, 1-8.
- [3] Throsby, D. (1999) *Cultural Capital*. *Journal of Cultural Economics*, 23, 1, 3-12.
- [4] Tubadji, A. and. Nijkamp, P. (2015) *Cultural impact on regional development: application of a PLS-PM model to Greece*. *The Annals of Regional Science*, 54, 3, 687-720.
- [5] Bucci, A. and. Segre, G. (2011) *Culture and human capital in a two-sector endogenous growth model*. *Research in Economics*, 65, 4, 279-293.
- [6] Bucci, A., Sacco, P.L. and Segre, G. (2014) *Smart endogenous growth: cultural capital and the creative use of skills*. *International Journal of Manpower*, 35, 1/2, 33-55.
- [7] Bellandi, M., Campus, D., Carraro, A. and. Santini, E. (2020) *Accumulation of cultural capital at the intersection of socio-demographic features and productive specializations*. *Journal of Cultural Economics*, 44, 1, 1-34.
- [8] Hall, R.E. and Jones, C.I. (1999) *Why do Some Countries Produce So Much More Output Per Worker than Others*. *The Quarterly Journal of Economics*, 114, 1, 83-116.
- [9] Ye, D., Ng, Y.-K. and Lian, Y. (2015) *Culture and Happiness*. *Social Indicators Research*, 123, 2, 519-547.