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Analysis of Factors Affecting Chongqing's Sustainable Economic Growth in China

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Abstract: In recent times, the importance of economic growth (EG) has increased due to the prevailing uncertainty in the global economic landscape. The significance of recent studies and policymakers should be underscored in addressing this matter. Therefore, this article aims to analyse the influence of educational attainment, greenhouse gas (GHG) emissions, employment rate, women's empowerment, and population growth on economic growth (EG) in China. The article utilised secondary data obtained from sources such as the World Development Indicators (WDI) spanning the years 1991 to 2022.The study also employed the dynamic autoregressive distributed lag (DARDL) model to examine the relationship between the variables under investigation. The findings of the study suggest that there is a positive correlation between the level of education, greenhouse gas emissions, employment rate, women's empowerment, and population growth with economic growth in China. This study assists policymakers in formulating policies aimed at enhancing economic growth through higher levels of education, efficient reduction of greenhouse gas emissions, increased employment rates, and the promotion of women's empowerment.

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Introduction

The primary objective of the global community is to secure the well-being and advancement of its inhabitants. The well-being of a nation's citizens is intricately linked to its economic circumstances. The economic welfare of a nation is the fundamental guarantee of its overall prosperity. China has emerged as a prominent global economy that has experienced significant and rapid growth. The nation is commonly described as a global manufacturing hub. China is the preferred choice for businesses and customers worldwide. China's economy has exhibited consistent growth since the implementation of the Great Reform in 1978, sustaining a growth rate of 6% or higher. In relation to per capita output, the nation has experienced a growth rate approximately four times higher than that of the United States Li, Strauss, Shunxiang, and Lui (2018). As a direct result of this phenomenon, China has successfully mitigated the disparity in living conditions among its citizens, as evidenced by historical data and factual evidence. During the period from 2010 to 2019, the nation made a significant contribution ranging from 25 to 39 percent towards the overall growth of the global Gross Domestic Product (GDP) (Adebayo, 2023). Furthermore, the nation achieved the top position in terms of product exports and secured the second position in product imports. Due to the implementation of economic reforms in 1978, the nation has experienced a notable expansion in its economic diversification, consequently establishing itself as a significant participant in the global economy (Zhou & Luo, 2018).

The expansion of the industrial sector by the government has resulted in a reduction of poverty, as estimated by the World Bank to be at a rate of 12 percent (Jiang & Yu, 2023) Consequently, China has witnessed a substantial reduction in its impoverished population, amounting to hundreds of millions of individuals. Nevertheless, this nation has achieved a more comprehensive and expeditious eradication of poverty compared to any other country worldwide. The role of the government was instrumental in facilitating the expansion of China's economy and its integration into the global market, as evidenced by the influx of investors into the Chinese market (Li, Strauss, Shunxiang, & Lui, 2018). Although there has been a deceleration in growth in recent years, it is projected that China will still achieve its growth objectives in 2021, with an anticipated increase of 8.1%. China has faced criticism for its ability to maintain an average annual growth rate of approximately 10% (Zhou, Gong, Luo, & Xu, 2018). The economic projection for China is presented in Figure 1.

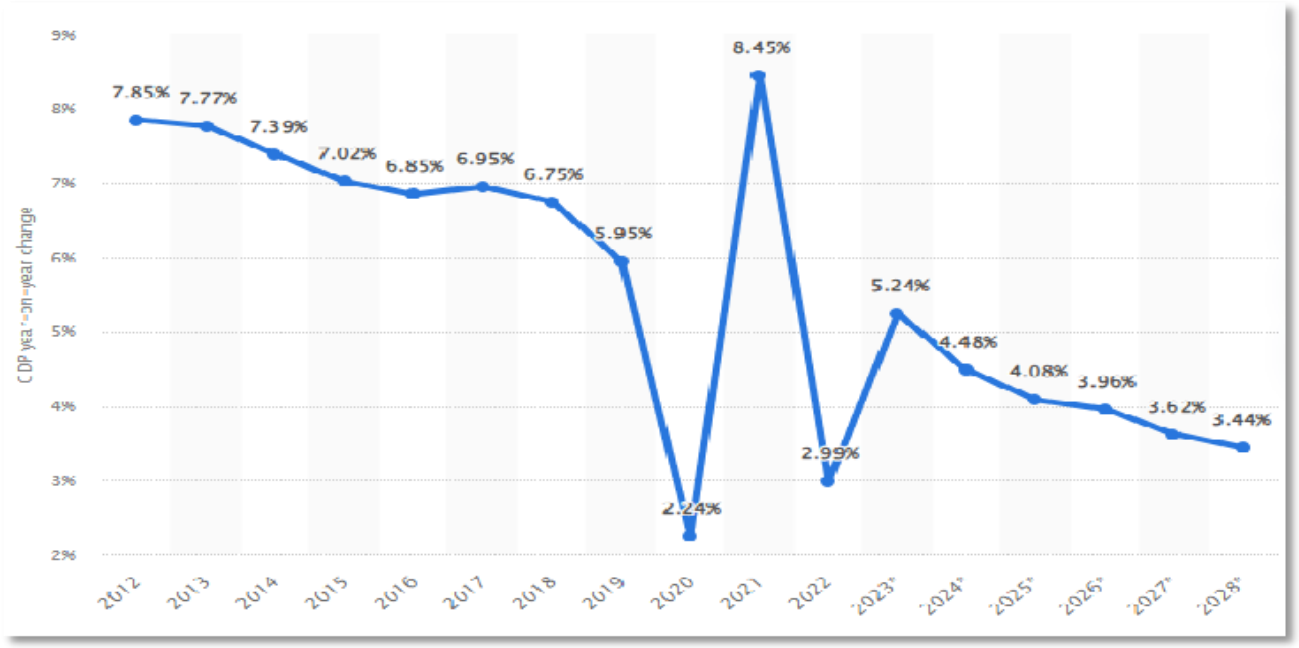

Figure 1: GDP of China
Source: Statista

However, there are numerous economic challenges that must be addressed to enhance the well-being of the Chinese economy in the coming years, particularly from 2024 onwards. Several key areas require attention, including: 1) The education system of the nation demands evaluation, given that China is among the world's most advanced economies. It is crucial to assess the Chinese education system in order to align it with global standard (Hanushek & Woessmann, 2021; Sequeira, 2021). 2) Environmental concerns pose a significant threat to China, primarily due to the extensive industrialization resulting in elevated emissions of greenhouse gases and related pollutants. These emissions could have comprehensive repercussions on the country (Adzawla, Sawaneh, & Yusuf, 2019; Sterpu, Soava, & Mehedintu, 2018). 3) The relatively low population growth rate is a notable challenge that could impede the nation's economic growth due to a scarcity of human resources. 4) China has made strides in promoting gender equality, contributing to a positive economic trend. Nevertheless, there remains a need to further explore gender equality within both rural and urban contexts (Braunstein, Bouhia, & Seguino, 2019; Nguyen, 2021). 5)Given the modest population growth rate, job creation has become a paramount undertaking for the country's economic development (Faruk, 2019; Lubbock, Merin, & Gonzalez, 2022).

This study addresses several gaps in the literature, as exemplified by the following cases:1) Hanushek and Woessmann (2020), Sequeira (2021), and Goczek, Witkowska, and Witkowski (2021) have examined the relationship between economic growth (EG) and

education across various nations globally. Similarly, this study delves into the same relationship while incorporating additional variables such as GHG emissions, employment, women's empowerment, and population growth within the context of China. 2) The investigation by Yusuf, Abubakar, and Mamman (2020), He, Li, Huang, and Wang (2022), and Sterpu, Soava, and Mehedintu (2018) has explored the connection between EG and GHG emissions across different countries. This study extends this relationship to China, introducing supplementary factors like education, employment, women's empowerment, and population growth.3) Oziengbe and Edore (2021), Khan, Xue, Zaman, and Mehmood (2022), and Anakusara, Jamal, Seftarita, and Maipita (2019) have scrutinized the relationship between EG and employment in diverse global contexts. Similarly, this study investigates this relationship in China, while integrating additional elements such as education, GHG emissions, women's empowerment, and population growth.4) The works of Firmansyah and Sihaloho (2021), Nguyen (2021), and Braunstein, Bouhia, and Seguino (2019) have probed the association between EG and women's empowerment across various countries. This study mirrors this examination within China, introducing supplementary variables like education, GHG emissions, employment, and population growth.5) Casey and Galor (2017), Kuhe (2019), and Lubbock, Merin, and Gonzalez (2022) have explored the correlation between EG and population growth across different global scenarios. Likewise, this study dissects this relationship concerning China, while incorporating additional components like education, GHG emissions, employment, and women's empowerment.

Literature Review

The economic prosperity of a nation is contingent upon a multitude of factors, with education being widely regarded as a paramount determinant. Education plays a pivotal role in fostering development across various sectors of the economy, primarily through the facilitation of innovation and other associated factors. There exists a correlation between education and economic growth (EG). In the present study, Marquez-Ramos and Mourelle (2019) examined the correlation between EG and education. The relationship was examined using the population data of Spain. The researchers decided to utilise a quantitative approach. The quantitative data spanning a period of 42 years was collected from the chosen country. The data selected encompasses the time spanning from 1971 to 2013. To investigate the relationship mentioned above, the approach of Multiple Linear Regression (MLR) analysis was utilised. The findings derived from the analysis indicate a correlation between EG and education. Moreover, the nature of the relationship exhibits a positive correlation. In a similar vein, the study conducted by Goczek, Witkowska, and Witkowski (2021) examined the association between education and EG. The investigation focused on examining the relationship within the population of OECD economies. The researchers decided to utilise a quantitative approach. A sample consisting of 23 observations was collected for quantitative data analysis. The data collection method employed in this study involved the administration of questionnaires. To investigate the association, the researchers utilised the PISA and GMM analysis methodologies. The findings derived from the analysis suggest the presence of a positive correlation between education and economic growth. Additionally, conducted an examination of the correlation between economic growth (EG) and education. The relationship was examined within a sample of 45 economies in the Sub-Saharan region. The study employed a quantitative approach. Quantitative data spanning a period of 40 years was collected from the chosen country. The data selected spans the time from 1960 to 2000. To investigate the relationship, the researchers utilised the linear regression approach. The results derived from the analysis indicate a correlation between EG and education. Moreover, there exists a positive correlation between economics and education. Furthermore, the study conducted by Islam, Ghani, Kusuma, and Theseira (2016) examined the correlation between education and economic growth (EG). The investigation focused on examining the relationship within the population of Malaysia. The researchers opted for a quantitative approach. A sample of 100 was selected from the chosen country to obtain quantitative data. The data collection method employed in this study involved the administration of questionnaires. To investigate the relationship, the research utilised the SPSS analysis method. The findings derived from the analysis suggest that education has a significant influence on economic growth. Moreover, there exists a positive correlation between education and economic growth (EG). In a similar vein, Donou-Adonsou (2019) conducted an examination of the correlation between EG and technology in the context of education. The relationship was examined within a sample of 45 economies in the Sub-Saharan region. The study employed a quantitative approach. Quantitative data spanning a period of 22 years was collected from the chosen country. The data selected spans from 1993 to 2015. To investigate the relationship, the researchers utilised the fixed-effects and moment estimator analysis methodologies. The findings derived from the analysis suggest a correlation between EG, technology, and education. Moreover, the correlation between technology and education is predominantly favourable.

The business sector is widely recognised as a crucial driver of economic growth and development. Over time, the progression of industrialization has resulted in an escalation in the utilisation of perilous chemicals that emit hazardous gases. While industrialization has contributed to economic growth (EG), it has also had adverse effects on the environment, particularly in the form of greenhouse gas (GHG) emissions. In the present study, Lapinskienė, Peleckis, and Slavinskaitė (2017) examined the correlation between EG and energy consumption in relation to greenhouse gas (GHG) emissions. The study examined the relationship within a sample of 22 economies belonging to the European Union. The study employed a quantitative approach. The researchers collected quantitative data spanning a period of 19 years from the chosen country. The data selected spans from 1995 to 2014. To investigate the relationship mentioned above, the researchers utilised the LR analysis approach. The findings derived from the analysis indicate a potential correlation between EG and GHG emissions. In a similar vein, Adzawla, Sawaneh, and Yusuf (2019) examined the correlation between EG and GHG emissions. The relationship was examined within the context of economies in Sub-Saharan Africa. The researchers opted for a quantitative approach. The study collected quantitative data spanning a period of 42 years from a specific country. The data selected spans from 1970 to 2012. To investigate the relationship, we utilised the ordinary least squares (OLS) regression analysis approach. The findings derived from the analysis indicate a

potential correlation between EG and GHG emissions. Furthermore, Hamit-Haggar (2012) examined the correlation between economic growth (EG) and greenhouse gas (GHG) emissions. The relationship was examined within the population of Canada. The researchers opted for a quantitative approach. The researchers collected quantitative data spanning a period of 17 years from the chosen country. The data selected spans the years 1990 to 2007. To investigate the relationship, the analysis approach of the Granger causality test was utilised. The findings derived from the analysis suggest a correlation between EG and GHG emissions. Additionally, the study conducted by Yang et al. (2017) examined the correlation between EG and GHG emissions. The relationship was examined in the context of Russia. The study employed a quantitative approach. Quantitative data spanning a period of 15 years was collected from the chosen country. The data selected spans from 1998 to 2013. To investigate the relationship, the research utilised the regression analysis method. The findings derived from the analysis suggest a correlation between EG and GHG emissions. Furthermore, Yusuf, Abubakar, and Mamman (2020) examined the correlation between EG and GHG emissions. The relationship was examined in the African context. The study employed a quantitative approach. The researchers collected quantitative data spanning a period of 46 years from the chosen country. The data selected spans from 1970 to 2016. To investigate the relationship, the study utilised the PARDL analysis approach. The findings derived from the analysis suggest a correlation between EG and GHG emissions. Furthermore, the study conducted by He, Li, Huang, and Wang (2022) examined the correlation between economic growth (EG), natural resources, energy consumption, and greenhouse gas (GHG) emissions. The relationship was examined in China. The researchers opted for a quantitative approach. The researchers collected quantitative data spanning a period of 47 years from the chosen country. The data selected spans from 1971 to 2018. To investigate the relationship, we utilised the ARDL analysis approach. The findings derived from the analysis indicate a correlation between EG and GHG emissions.

The human capital of a nation plays a pivotal role in shaping its future trajectory. The presence of highly skilled individuals contributes to the growth of the economy by virtue of their expertise and abilities. Conversely, the lower employment rate results in an augmented strain on the economy due to heightened resource utilisation and diminished productivity. There exists a strong correlation between employment and economic growth (EG). In the present study, Aigheyisi (2021) examined the correlation between EG and employment. The relationship was examined within the population of Nigeria. The researchers opted for a quantitative approach. The researchers collected quantitative data spanning a period of 29 years from the chosen country. The data selected spans from 1991 to 2020. To investigate the relationship mentioned above, the ARDL analysis approach was utilised. The findings derived from the analysis suggest a correlation between EG and employment. Moreover, the nature of the relationship exhibits a positive connotation. Furthermore, Anakusara, Jamal, Seftarita, and Maipita (2019) conducted an investigation into the correlation between EG and employment, specifically within the field of Agriculture. The relationship was examined within the population of Aceh Province. The study employed a quantitative approach. The researchers collected quantitative data spanning a period of 22 years from the chosen country. The data selected encompasses the time from 1995 to 2017. To investigate the relationship, we utilised the ARDL analysis approach. The findings derived from the analysis suggest a correlation between EG and employment. Moreover, the nature of the relationship exhibits a positive correlation. In a similar vein, Khan, Xue, Zaman, and Mehmood (2022) examined the correlation between economic growth (EG), foreign direct investment (FDI), industrialization, and employment. The relationship was examined within the population of Pakistan. The researchers opted for a quantitative methodology. Quantitative data spanning a period of 29 years was collected from the chosen country. The data selected spans from 1990 to 2019. To investigate the relationship, we utilised the ARDL analysis approach. The findings derived from the analysis suggest a correlation between economic growth (EG), foreign direct investment (FDI), industrialization, and employment.

Gender equality is a significant subject of contemporary relevance. Over time, the contribution of women to the economic development of a nation is increasing. Scholarly literature has also put forth the notion that there exists a correlation between women's empowerment and economic growth (EG). In the present study, Firmansyah and Sihaloho (2021) examined the correlation between entrepreneurial growth (EG) and the empowerment of women. The relationship was examined within the population of Indonesia. The study employed a quantitative approach. The study collected quantitative data over a period of four years from a specific country. The chosen time spans from 2014 to 2018. To investigate the relationship, we utilised the panel data regression analysis approach. The findings derived from the analysis indicate a correlation between entrepreneurial growth (EG) and the advancement of women's empowerment in Indonesia. Nguyen (2021) conducted an investigation to examine the correlation between entrepreneurial growth (EG) and the empowerment of women. The relationship was examined among a sample of 119 economies worldwide. The study employed a quantitative approach. Quantitative data spanning a period of 26 years was collected from the chosen country. The data selected spans from 1991 to 2017. To investigate the relationship, we utilised the system generalised analysis approach. The findings derived from the analysis indicate a potential correlation between EG and the promotion of women's empowerment within the framework of gender equality. Furthermore, Braunstein, Bouhia, and Seguino (2019) conducted an examination of the correlation between EG and the domains of social reproduction and women's empowerment. The relationship was examined using a sample of 156 global economies. The study employed a quantitative approach. Quantitative data spanning a period of 24 years was collected from the chosen country. The data selected spans from 1991 to 2015. To investigate the relationship mentioned above, the methodology of regression analysis was utilised. The findings derived from the analysis indicate a potential correlation between educational attainment, the perpetuation of social structures, and the advancement of women's empowerment.

The exponential growth of the global population poses a significant concern for the future of our planet. Over time, there has been a depletion of natural resources, coinciding with a rapid increase in population. Consequently, various factors such as unemployment contribute to an increase in the pressure on the economic growth (EG). In the present study, Kuhe (2019) examined

the correlation between EG and population growth. The relationship was examined using data from the population of Nigeria. The researchers opted for a quantitative methodology. The researchers collected quantitative data spanning a period of 55 years from the chosen country. The chosen time spans from 1960 to 2015. To investigate the relationship mentioned above, the DFG analysis approach was utilised. The findings derived from the analysis suggest a correlation between EG and population growth in Nigeria. In a similar vein, Lubbock, Merin, and Gonzalez (2022) examined the correlation among inflation in the EG, unemployment rates, and population growth. The relationship was examined within the context of the Philippine population. The study employed a quantitative approach. Quantitative data spanning a period of 29 years was collected from the chosen country. The data selected spans from 1991 to 2020. To investigate the relationship, the study utilised the Ordinary Least Squares (OLS) regression analysis method. The findings derived from the analysis indicate a potential correlation among EG, inflation, unemployment, and population growth. Furthermore, the study conducted by Faruk (2019) examined the correlation between economic growth (EG) and population growth. The relationship was examined in Nigeria. The researchers opted for a quantitative approach. The researchers collected quantitative data spanning a period of 47 years from the chosen country. The data selected spans the years 1970 to 2017. To investigate the relationship, the ARDL analysis approach was utilised. The findings derived from the analysis suggest a correlation between economic growth (EG) and population growth.

Research Methodology

This article examines the influence of educational attainment, greenhouse gas emissions, employment rate, women's empowerment, and population growth on economic growth in China. The article utilised secondary data obtained from secondary sources, specifically the World Development Indicators (WDI) spanning the years 1991 to 2022. The study established the equation as under:

$$EG_t = \alpha_0 + \beta_1 EL_t + \beta_2 GHGE_t + \beta_3 ER_{it} + \beta_4 WE_t + \beta_5 PG_t + e_t \quad (1)$$

Where;
EG = Economic Growth
t = Time Period
EL = Education Level
GHGE = Green House Gas Emission
ER = Employment Rate
WE = Women Empowerment
PG = Population Growth

The study utilised the EG as the dependent variable, which was assessed through the measurement of GDP growth (annual percentage). Furthermore, the research also incorporated five predictors, namely education level proxies represented by educational attainment of at least a Bachelor's degree or its equivalent for individuals aged 25 and above, population 25+ total (%); GHG emissions proxies represented by the percentage change in total greenhouse gas emissions compared to 1990 levels; employment rate proxies represented by the employment to population ratio for individuals aged 15-24, total (%); and women empowerment proxies Population growth proxies can be considered as indicators or measures of population growth (annual percentage). These measurements are given in Table 1.

Table 1: Variables with Measurements

S#	Variables	Measurement	Sources
01	Economic Growth	GDP growth (annual percentage)	WDI
02	Education Level	Educational attainment, at least Bachelor's or equivalent, population 25+, total (%)	WDI
03	Green House Gas Emission	Total GHG emissions (% change from 1990)	WDI
04	Employment Rate	Employment to population ratio, ages 15-24, total (%)	WDI WDI
05	Women Empowerment	Employment to population ratio, ages 15-24, female (%)	WDI
06	Population Growth	Population growth (annual percentage)	WDI

This study examines the specifics of the constructs through the utilisation of descriptive statistics, which provide information on the average and standard deviation values, as well as the minimum and maximum values. Furthermore, the study also investigates the correlation by employing a correlation matrix. Additionally, the present study examines the presence of a unit root among constructs by employing the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The estimation equation is mentioned below:

$$d(Y_t) = \alpha_0 + \beta t + \gamma Y_{t-1} + d(Y_t(-1)) + \mathcal{E}_t \quad (2)$$

Furthermore, the present study also examines the concept of co-integration, which is employed to determine the suitable model. The assessment of co-integration is conducted using the approach proposed by Westerlund and Edgerton (2008). The estimation equation is mentioned below:

$$LM_{\varphi}(i) = T\,\hat{\varphi}_i\,(\hat{r}_i/\hat{\sigma}_i) \quad (3)$$

$$LM_{\tau}(i) = \hat{\varphi}_i/SE(\hat{\varphi}_i) \quad (4)$$

The equations given above shows $\hat{\varphi}_i$ that exposed the estimate beside standard error, while it also shows r^2_i that exposed the long-run measured variance. It also shows $\varphi i\ (L) = 1 - \sum \varphi_i$ that exposed the scalar polynomial with L lag length, and it also shows ρ_i that exposed the factor loading parameters vector.

Additionally, the study employed the autoregressive distributed lag (ARDL) model, which facilitates the examination of both long-term and short-term relationships among the variables. Moreover, this model is also appropriate when certain variables exhibit no unit root at I(0), while other variables display no unit root at I (1) (Nazir, Nazir, Hashmi, & Ali, 2018). Additionally, the ARDL approach effectively mitigates the adverse impacts of heteroscedasticity and auto-correlation on the estimations (Zaidi & Saidi, 2018). The equation for the approach is mentioned below:

$$\Delta EG_t = \alpha_0 + \sum\delta_1 \Delta EL_{t-1} + \sum\delta_2 \Delta GHGE_{t-1} + \sum\delta_3 \Delta ER_{t-1} + \sum\delta_4 \Delta WE_{t-1} + \sum\delta_5 \Delta PG_{t-1} + \varphi_1 EG_{t-1} + \varphi_2 EL_{t-1} + \varphi_3 GHGE_{t-1} + \varphi_4 ER_{t-1} + \varphi_5 WE_{t-1} + \varphi_6 PG_{t-1} + \mathcal{E}_t \quad (5)$$

The DARDL model was utilised in this study to examine the relationship between the variables. The development

of this particular concept was undertaken by (Jordan & Philips, 2018). The system effectively manages all the limitations present in the conventional ordinary least squares regression model that impact the accuracy of estimations. The equation is mentioned below:

$$\Delta EG_t = \alpha_0 + \sum\delta_1\Delta EG_{t-1} + \sum\delta_2\Delta EL_t + \sum\delta_3\Delta EL_{t-1} + \sum\delta_4\Delta GHGE_t + \sum\delta_5\Delta GHGE_{t-1} + \sum\delta_6\Delta ER_t + \sum\delta_7\Delta ER_{t-1} + \sum\delta_8\Delta WE_t + \sum\delta_9\Delta WE_{t-1} + \sum\delta_{10}\Delta PG_t + \sum\delta_{11}\Delta PG_{t-1} + \mathcal{E}_t \quad (6)$$

Research Findings

This study examines the specific details of the constructs by utilising descriptive statistics, which provide information on the average and standard deviation values, as well as the minimum and maximum values. The results revealed that the average value of EG was 9.062 percent, EL was 3.568 percent, and GHGE was 153.795 percent. Ultimately, the results also demonstrated that the average ER value was 56.318 percent, WE was 15.113 percent, and PG was 0.682 percent. These figures are shown in Table 2.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
EG	32	9.062	2.801	2.239	14.231
EL	32	3.568	0.033	3.513	3.623
GHGE	32	153.795	129.39	3.662	394.495
ER	32	56.318	9.985	40.811	73.995
WE	32	15.113	8.277	1.921	28.784
PG	32	0.682	0.317	-0.013	1.364

Furthermore, the research also investigates the correlation by employing a correlation matrix. The results of the study demonstrate a positive correlation between educational attainment, greenhouse gas emissions, employment rate, women's empowerment, and population growth with economic growth in China. These associations are mentioned in Table 3.

Table 3: Matrix of Correlations

Variables	EG	EL	GHGE	ER	WE	PG
EG	1.000					
EL	0.669	1.000				
GHGE	0.672	0.973	1.000			
ER	0.652	-0.995	-0.952	1.000		
WE	0.672	0.999	0.973	-0.995	1.000	
PG	0.548	-0.903	-0.825	0.915	-0.902	1.000

In addition, the present study also examines the presence of a unit root among the constructs through the implementation of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The findings indicate that the constructs of EG, EL, WE, and PG exhibit no unit root at the integrated of order zero (0)), while GHGE and ER similarly display no unit root at I (1). These outcomes are given in Table 4.

Table 4: Unit Root Test

	ADF		PP	
Series	Level	First difference	Level	First difference
EG	-2.099***	------	-2.011***	------
EL	-2.101***	------	-2.001***	------
GHGE	------	-3.762***	------	-3.271***
ER	------	-3.888***	------	-3.524***
WE	-2.009***	------	-2.611***	------
PG	-2.187***	------	-2.317***	------

Furthermore, the present study also examines the concept of co-integration, which is utilised for the purpose of selecting the most suitable model. The evaluation of co-integration is conducted by employing the approach proposed by Westerlund and Edgerton (2008). The results revealed that the t-values exceeded 1.96 and the p-values were below 0.05. The values are provided in Table 5.

Table 5: Co-integration Test

Model	No Shift		Mean Shift		Regime Shift	
	Test Stat	p-value	Test Stat	p-value	Test Stat	p-value
LM_τ	-4.101	0.000	-5.029	0.000	-3.282	0.000
LM_φ	-4.333	0.000	-5.192	0.000	-3.728	0.000

The DARDL model was utilised in this study to examine the relationship between the variables. The results of the study suggest that there is a positive relationship between the education level, GHG emissions, employment rate, women empowerment, and population growth with economic growth (EG) in China. The associations are presented in Table 6.

Table 6: Dynamic ARDL Model

Variable	Coefficient	t-Statistic	Prob.
ECT	-2.191***	-3.281	0.002
EL_{t-1}	0.873***	5.774	0.000
EL	0.641**	2.098	0.034
$GHGE_{t-1}$	2.181**	2.011	0.046
GHGE	1.112***	3.874	0.000
ER_{t-1}	0.644***	3.271	0.003
ER	0.645***	4.984	0.000
WE_{t-1}	1.272***	3.292	0.001
WE	3.282***	4.895	0.000
PG_{t-1}	3.922***	4.736	0.000
PG	3.272***	6.984	0.000
Cons	3.780***	5.482	0.000
R square = 63.281		Stimulation = 5000	

Discussions

The results of the study indicate a positive correlation between educational attainment and the promotion of sustainable economic growth. The findings presented are consistent with the research conducted by Kopnina (2020), suggesting that education for adolescents fosters an understanding of political and economic contexts and cultivates vocational skills. As individuals acquire greater knowledge and develop proficiency in various domains, they are empowered to establish and manage new enterprises with enhanced efficacy. The augmentation of educational attainment among the younger population has the potential to foster economic growth and enhance overall economic well-being. The findings presented by Hanushek and Woessmann (2020) provide support for the notion that countries that prioritise the breadth and quality of education, as well as the implementation of novel pedagogical approaches, foster the development of creativity in students and equip them with the necessary skills to meet the demands of a dynamic economy. The students in question contribute to the growth of the economy.

The findings of the study indicate a negative correlation between greenhouse gas emissions (GHGE) and the attainment of sustainable economic growth (EG). The findings presented in this study align with the research conducted by Vasylieva, Lyulyov, Bilan, and Streimikiene (2019), who propose that sustainable environmental governance entails the preservation of the environment and the availability of abundant natural resources for economic utilisation. When there is a rise in greenhouse

gas emissions (GHGE) resulting from various social and economic activities performed by humans, it leads to environmental pollution and hinders the progress towards achieving sustainable economic growth (EG). The findings presented in this study are consistent with the findings of Sarkodie et al. (2019), who also observed that the increasing levels of greenhouse gas emissions (GHGE) resulting from the use of chemical-based products, energy consumption, and transportation emissions pose significant challenges to the sustainability of the environment. The results of the study indicate a positive correlation between the employment rate and EG. These findings are consistent with the research conducted by Dabbous and Tarhini (2021), which posits that an increase in the employment rate leads to a greater availability of workers in various industries. Furthermore, an increase in the labour force allows organisations to accommodate larger orders, expand their production capabilities, and offer a wider range of products and services for marketing purposes. The expansion of domestic enterprises contributes to the sustainability of the national economy. The findings presented in this study are consistent with the research conducted by Manzoor et al. (2019), which suggests that an increase in the employment rate can facilitate the introduction of additional skilled individuals into organisations. This, in turn, contributes to the sustainable development of the economy.

The findings of the study indicate a positive correlation between women's empowerment and economic growth. These findings are consistent with the research conducted by Akhter and Cheng (2020), suggesting that women possess inherent traits of responsibility, perseverance, and a stronger commitment to their professional endeavours. The empowerment of women to make professional choices, rather than being confined to household chores, has the potential to bring about a transformative impact on the field of business management. The outcome is the achievement of sustainability in the field of environmental governance. These findings are consistent with Gupta (2021) research, which posits that the empowerment of women in administrative roles within an organisation leads to effective regulation and an increase in their contribution to sustainable economic growth. The findings of the study indicate a positive correlation between population growth and economic growth. The findings presented in this study are consistent with the research conducted by Khan, Hou, and Le (2021), who argue that in a nation characterised by a higher population growth rate, coupled with increased investment in human capital development, the economy achieves sustainable economic growth. The findings presented are consistent with the research conducted by Zhang et al. (2021), suggesting that the growth of a population plays a significant role in shaping the level of human capital within a nation. The escalating rate of population growth engenders alterations in both the geographical conditions and infrastructure of a nation, as it elicits heightened governmental focus and investment. The outcome leads to the achievement of sustainability in the context of EG.

Policy Implications

The increase in EG is a pressing requirement for a nation. In addition to their economic growth, countries must prioritise sustainability to enhance the well-being of their citizens and achieve success in the global market. This article provides a set of guidelines aimed at enhancing sustainability in emerging regions such as Chongqing, China, with a specific focus on economic growth (EG). It is imperative to enhance the study guides pertaining to education levels, and to foster motivation among most adolescents to cultivate sustainability within the context of EG. Additionally, it should be noted that the rapid generation of energy from certain sources results in the emission of greenhouse gases (GHGs) to support the sustainability of the energy grid. Additionally, it has been suggested that an increase in the employment rate could contribute to the development of sustainability in EG. The study suggests that enabling women's empowerment is crucial for promoting sustainability in the context of EG. Additionally, the research indicates that it is crucial to engage in thorough and strategic planning to address the challenges posed by population growth and ultimately attain sustainable economic growth. This study assists policymakers in formulating policies aimed at enhancing economic growth through higher levels of education, efficient reduction of greenhouse gas emissions, increased employment rates, and the promotion of women's empowerment.

Conclusion

The primary aim of the authors was to investigate the effects of education level, population growth, greenhouse gas emissions (GHGE), employment rate, and women empowerment on economic growth (EG). The author's attention was drawn to the city of Chongqing in China as a suitable sample for collecting data on various socio-economic indicators, including education level, population growth, greenhouse gas emissions, employment rate, women's empowerment, and GDP. This data was obtained from relevant statistical sources. The findings of the study indicate a positive association between educational attainment, population growth, greenhouse gas emissions, employment rate, and women's empowerment with economic growth. The findings of the study indicate that enhancing the education level by employing highly skilled tutors, enhancing educational infrastructure, and revising the curriculum leads to the creation of higher quality human capital, which is essential for achieving sustainable economic growth. The findings demonstrated a positive correlation between higher levels of greenhouse gas emissions (GHGE) and the utilisation of technologies reliant on fossil fuel energy sources. The country has achieved sustainable economic growth because of the growing utilisation of large-scale technologies. The research findings emphasise that an increase in the employment rate leads to a corresponding increase in the number of workers serving various business firms. This, in turn, contributes to the production of goods and services, thereby enhancing sustainability in the context of economic growth. Likewise, in the event of heightened population growth, there is a corresponding augmentation in the number of individuals engaged in business management and production endeavours. Ultimately, the development of a country is contingent upon achieving sustainable growth and progress. The study additionally determined that the promotion of women's empowerment leads to a notable augmentation in the presence of skilled, conscientious, and committed workforce within the economy, thereby fostering sustainable economic growth.

Limitations

The study's implications are subject to certain limitations, necessitating a need for modification. In assessing sustainability in the context of EG, several macroeconomic factors are considered, including education level, population growth, greenhouse gas emissions (GHGE), employment rate, and women's empowerment. It is imperative for authors to acknowledge the limitations of their study and demonstrate the challenges encountered in conducting a comprehensive investigation that accounts for a broader range of influential factors. Furthermore, scholars examine the correlation between the variables, scrutinising the empirical data gathered from Chongqing, a municipality in the People's Republic of China. To enhance clarity and expand the scope of implications, it is imperative that research evidence be derived from a more extensive economic context.

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