Impact of Production, Consumption Capabilities and Human Capital Capacity on the National Wealth of China

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Abstract: The recent improvement of China's national income has been a global phenomenon due to the uncertain financial and economic conditions. Hence, the current research investigates the impact of production and consumption capabilities and human capital capacity on the national wealth of China. This study uses secondary data from secondary sources, including the World Bank Indicators (WDI), from 1991 to 2020 to examine the stationarity of the constructs using the augmented Dickey–Fuller (ADF) test. It also investigates the association among the variables using the autoregressive distributed lag (ARDL) model. The results revealed that production and consumption capabilities and human capital capacity are significantly and positively linked with the national wealth of China. This study provides guidelines for regulators as they establish policies regarding national income improvement using production, consumption, and human capital factors.

Keywords: *Production capabilities, Consumption capabilities, Human capital capacity, National wealth, Net national income.*

1. Introduction

Fulford (2018) defined wealth as the total value of economic commodities gained over a period of time. National wealth refers to the assets of the residents within a country and is dependent on the ownership of economic assets. Historical monuments, for example, are not included. National wealth includes non-financial assets of resident individuals or institutions, including tangible assets such as homes, other buildings, machinery and other equipment, and intangible assets such as software applications and other produced assets (stocks) or non-produced assets (Dierckens et al., 2020). National wealth is a crucial macroeconomic indicator that shows a country's accumulated wealth over time and serves as the foundation for economic and social progress. The countries with a large amount of national wealth have the ability to bring innovation, improvement, acceleration, and progress to the economy and lead the economy towards sustainable success. These countries also have the ability to improve the social well-being of residents through increased employment opportunities, increased use of goods and services, and developmental or constructive work within society (Arsenio, 2018). There are several economic factors, such as production and consumption capabilities and human capital capacity, which influence the national wealth of a country. Production capabilities refer to the ability to produce at the optimal rate and maintain that rate. These production capabilities also include the aggregate of currently used, available, and unavailable capabilities that are unique to the creation of specific goods and services. The improvement in production capabilities facilitates economic activities and helps create national wealth (Li et al., 2020). Consumption capability is the ability of individuals, institutions, and government to pay for goods and services in order to fulfil their needs. It is based on the availability of goods and services, the power to acquire these goods and services, the appropriate time and space, and the ability to use the products and services optimally. For the creation of national wealth, individuals, institutions and governments need high consumption capability, which ensures the undertaking of economic activities and the production of

goods and services (Doğan, Balsalobre-Lorente, & Nasir, 2020). Human capital capacity lies in the health, education, knowledge, training, skills, intelligence and other employee attributes, such as punctuality, commitment and loyalty. The human capital capacity determines people's efficiency in performing their assigned tasks and producing goods and services that benefit the economy. If the human capital capacity is high, the contribution of businesses to the national wealth also improves (Hassan, Baloch, Mahmood, & Zhang, 2019). This article examines production and consumption capabilities and the role of human capital capacity in creating national wealth for China's developing economy. It is a market-oriented mixed economy that executes economic planning via industrial policies and five-year plans. The state-owned firms and mixed-ownership firms have a dominant place in the economy. The Chinese economy also has participation from private firms and interest from foreign individuals and businesses (Wang, Zhao, Li, & Su, 2018). In 2019, in the Chinese economy, the state-owned enterprises contributed to 60% of the overall market capitalization, estimated to account for 40% of the country's GDP, which was US$15.96 trillion (101.35 trillion yuan) in 2020. At the same time, domestic and foreign private investments and businesses contributed to the remaining 60% of China's GDP. The total assets of state-owned enterprises along with the assets from financial institutions accounted for US$78.08 trillion by the last quarter of 2019 (Wang, Su, & Li, 2018). Ninety-one of these state-owned enterprises were included in Fortune's Global 500 firms in 2020. Regarding nominal GDP, China is the second largest economy in the world, and it is the largest if the size of an economy is determined by purchasing power parity (PPP). Since 2010, it's been the second largest by nominal GDP, with data based on fluctuating market exchange rates (Liang & Yang, 2019). It is estimated that China could overtake the United States as the world's largest economy in terms of nominal GDP by 2028. For most of the 19th century, China has been one of the world's most significant economic powers. China is the wealthiest country in the world, and according to 2018 country statistics, the country ranks first in terms of the number of billionaires and comes second according to its number of millionaires (there are 659 Chinese billionaires and 3.5 million Chinese are millionaires). In 2020, China's net worth increased from $156 trillion in 2000 to $514 trillion, and China exceeds the US as the richest country in the world when there is a three times increase in the global wealth over the last two decades (Azam, Khan, & Ozturk, 2019). Statistics related to China's industry production capacity are given in Figure 1.
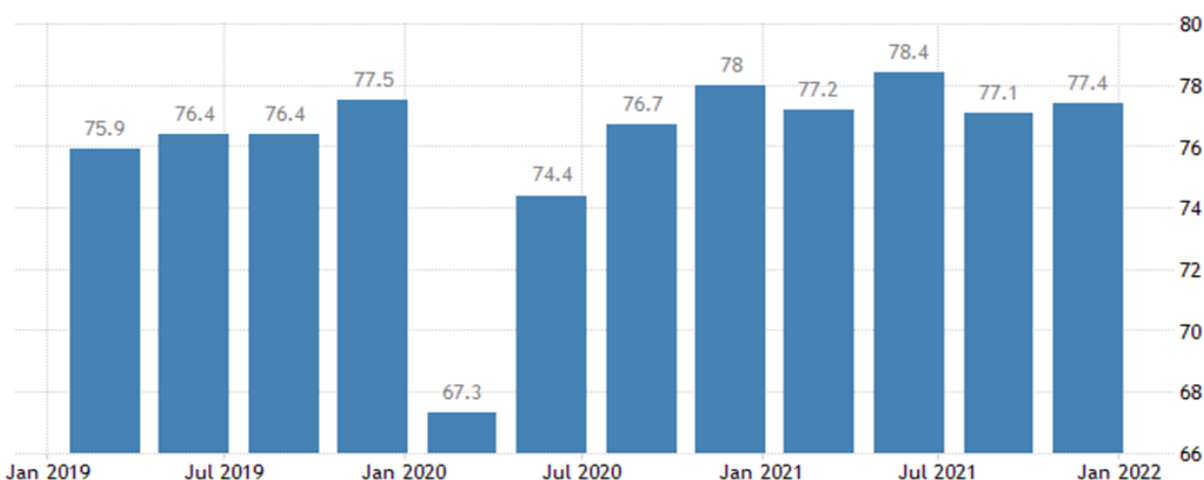
Figure 1.
Industry production capacity in China.
Source: Tradingeconomics.com, National Bureau of Statistics of China.

Countries which are underdeveloped or developing with lower- and middle-income economies have a lower creation of national wealth. This low creation of national wealth hinders their progress toward social development and economic performance and keeps them at the bottom of the list of progressive

countries in the international market (Ahmad et al., 2020). The governments of these countries must focus on raising the level of national wealth creation. This study examines the influences of production and consumption capabilities and human capital capacity on creating national wealth with the aim of filling literary gaps. The impact of production and consumption capabilities on national wealth has been examined in previous studies, but as these two terms have their own significant effects on economic and social activities and contribute to the national income of a country, they have been addressed separately. This study makes a valuable contribution to the existing literature by collectively analyzing the effects of these two factors on national wealth. Second, in the previous literature, the relation of production and consumption capabilities with national wealth has been examined, and this the first time that the production capabilities have been measured using the crops production index (CPI) and electricity production from coal sources (EPCS), while consumption capabilities are measured by financial consumption expenditure (FCE) and gross national expenditure (GNE) for their relation to national wealth. Third, although the Chinese economy is fit for analysis because of its large scope of national wealth, it has not been given focus in previous studies.

The paper is structured as follows: the literature review in Section 2 contains the author's arguments regarding the production and consumption capabilities and human capital capacity role in creating national wealth; Section 3 comprises the analysis methodology applied; Section 4 explains the results and the nexus among the aforementioned elements and national wealth creation; Section 5 contains the discussion; the conclusions are drawn in Section 6; and Section 7 explains the study's limitations and makes recommendations for future research.

2. Literature Review

National wealth is the value of a country's accumulated wealth created over a specific time and provides a basis for economic development and social progress. Countries with a large amount of national wealth perform sustainably and have the ability to innovate, improve and progress their economies and improve social well-being through developmental activities and improved living standards (Shmelev & Ayres, 2021). Several factors, such as the production and consumption of goods and services, including money and the efficiency of human resources, affect the creation of national wealth. In the existing literature, several authors have presented their views on production and consumption capabilities and human capital capacity impacts on national wealth.

The production capacity of a company is the maximum production of goods or services for a given period of time. These production capabilities also include the sum of the capabilities currently employed, available, and unavailable to facilitate the production of particular goods and services (Kulcsár, Mankovits, & Ailer, 2021). The production capabilities affect the production of goods and the profits earned from the sale of these products. These goods may be assets for many residents, social institutions, and profit-making organizations, and the earnings from the sale of products in the form of cash or bank transactions are assets for the companies. These assets contribute to the national wealth (Zhang et al., 2020). Research conducted by Ezenne, Jupp, Mantel, & Tanner (2019) investigated the potential capabilities of unmanned aerial systems (UAS) for crop water productivity in precision agriculture. The study throws light on the fact that traditionally, for irrigation scheduling, farmers used to detect crop water conditions through situ measurements of weather conditions and soil moisture. This method is time-consuming and fails to adapt to spatial and temporal variability attributed to crop water status. But UAS, the digital technology used in precision agriculture for the same purpose, gives better results and is the best method for the successful production of crops. Hence, the production capability of UAS for the creation of national wealth is in the form of crops and forests and related commodities. An article on cooperative pig farmers' safe production (Chen, Qin, Trienekens, & Wang, 2018) examines their capabilities for safe and clean production, their level of productivity, and their contribution to China's national wealth. Through the application of a cross-sectional survey technique, data on the safety capabilities of farmers, the level of productivity, and national income as the indicator of national wealth were acquired from 540 farmers in 27 pig cooperatives in China. The hypotheses regarding the relationship among the concerned variables were tested through a logit

regression model. The findings indicated that in the cooperatives in China, if the pig farmers have safe production capabilities, the cooperatives showed higher environmental and financial performance, which contributes significantly to the country's national wealth. Hence, the production capabilities have a positive link to national wealth. The research by Cristóbal, Guillén-Gosálbez, Jiménez, & Irabien (2012) investigated the optimal electricity production capability of coal-fired power plants and their contribution to the national income of the country. The results showed that the optimal electricity production capability of coal-fired power plants are positively linked to the national income of the country.

Consumption capabilities also play a significant role in the creation and development of a country's national wealth (Usman, Ozturk, Hassan, Zafar, & Ullah, 2021). Consumption capability refers to the ability of individuals, institutions and governments to spend money on products and services in order to meet their requirements. Individuals, institutions, and governments require a high consumption capability in order to create national wealth because it is the consumption capability that determines the performance of economic activities and the production of goods and services (Abbasi, Shahbaz, Jiao, & Tufail, 2021). The research by Onifade, Çevik, Erdoğan, Asongu, & Bekun (2020) investigated the consumption capability of government, economic growth, and national wealth in Nigeria. To understand the consumption capability of the government, public expenditures with respect to recurrent expenditure, capital expenditure and fiscal expansion for the budgetary allocations to different sectors were analyzed. Pesaran's ARDL approach was applied, and through annual time series, data technique evidence regarding the factors and their relationships were collected from the Nigerian economy from 1981 to 2017. The Granger causality test was used to analyze the causal relationship among the factors. The study posits that there is a causal relationship between the consumption capability of the government and the national wealth creation as the effective consumption capability on the part of government brings improvement in the economic activities and leads to a rise in economic growth. Zhao & Tang (2018) empirically investigated the dynamic link among consumption capability, health expenditure, CO2 emissions, economic growth and national wealth. An annual panel data technique and the autoregressive distributive lag (ARDL) model were employed to examine the Pakistani economy from 1995 to 2017 to determine the nexus among consumption capability, health expenditures, CO2 emissions, economic growth and national wealth. The study revealed that effective consumption capability and health expenditures by economic institutions and government reduced the CO2 emissions and improved the quality of the work environments. Improved working environments were found to enhance productivity, adding to the national wealth of the country. Therefore, consumption capability has a positive link to national wealth.

Prasetyo & Kistanti (2020) explained that human capital is the market or economic value of labor force skills and experiences. Human capital comprises assets such as health, education, knowledge, training, skills, intelligence, and other attributes such as punctuality, commitment and loyalty. Human capital assets are perceived as accelerators in improving the productivity of human resources and the profitability that they acquire. An increase in the investment in different assets of human capital increases the chances of having improved productivity which contributes to a country's national wealth. Xu & Li (2020) stated that human capital has a strong relation to economic growth as it is useful in boosting business activities and allowing the economy to grow. Increased human capital in areas such as education, science and management brings innovation both in economic and social aspects, improves social well-being, increases employees' engagement and improves the quality of products and services; all these contribute to the national wealth of a country (Ogundari & Awokuse, 2018). A study conducted by Ahmed, Asghar, Malik, & Nawaz (2020) examined the impacts of human capital, natural resource abundance and urbanization on national wealth as indicators of economic growth for China's economy. They used the Bayer and Hanck cointegration test along with the bootstrap causality method to determine cointegration and causal relations between the factors. The results imply that human capital contributes to the national wealth of China as the workers have an awareness of environmental concerns and the abilities, intelligence and skills to mitigate the negative economic impacts on environmental quality. A clean environment keeps the laborers active and improves productivity. Consequently, the national wealth of the country increases. An article by Amna, Yaseen, Kousar, Usman, & Makhdum (2020) examined the trade openness and human

capital capacity impact on economic growth determined by national wealth. They used 19 countries from two Western and Southern Asia regions from 1985–2017 as the sample for their research. Unit root tests, Kao and Fisher cointegration tests, and the DH causality test along with fully modified OLS and dynamic OLS models were applied to test the nexus among all factors. The results imply that increased human capital in different economic sectors improves the effectiveness of firms, enhances their productivity, improves their profitability and increases their share in the economic growth of the country. It was concluded that human capital positively influences the national income of a country and that there is a positive relationship between human capital capacity and national wealth creation.

3. Research Methodology

This research investigates the impact of production and consumption capabilities and human capital capacity on the national wealth of China. Secondary data from 1991 to 2020 was used, which was extracted from the WDI. The study equation is given as follows:

$$NNI_t = \alpha_0 + \beta_1 CPI_t + \beta_2 EPCS_t + \beta_3 FCE_t + \beta_4 GNE_t + \beta_5 HCI_t + e_t \qquad (1)$$

Where:
NNI = net national income.
t = time period.
CPI = crops production index.
EPCS = electricity production from coal sources.
FCE = final consumption expenditures.
GNE = gross national expenditures.
HCI = human capital index.

The current study used China's national wealth as the predictive variable, which was measured as the net national income (annual percentage growth). The following three predictors were used: production capabilities measured as the crops production index and electricity production from coal sources (% of total); consumption capabilities measured as the final consumption expenditures (% of GDP) and gross national expenditures (% of GDP); and human capital capacity measured as the human capital index. Table 1 shows the variables and their measurements.

Table 1.
Measurements of the variables.

S#	Variables	Measurement	Sources
01	National Wealth	Net national income (annual percentage growth)	WDI
02	Production Capabilities	Crops production index	WDI
		Electricity production from coal sources (% of total)	WDI
03	Consumption Capabilities	Final consumption expenditures (% of GDP)	WDI
		Gross national expenditures (% of GDP)	WDI
04	Human Capital Capacity	Human capital index	WDI

Descriptive statistics were used to show the variables' descriptives, such as mean, standard deviation, number of observations, and minimum and maximum values. A correlation matrix was also run to show the directional linkages among the variables. In addition, the stationarity of the constructs was examined using the augmented Dickey–Fuller (ADF) test. The equation of the test is given as:

$$d(Y_t) = \alpha_0 + \beta t + Y Y_{t-1} + d(Y_t(-1)) + \varepsilon_t \qquad (2)$$

The ADF test characteristic is that it examines the stationarity individually. Hence, the separate equations for the ADF test for each construct are as follows:
Net National Income:

$$d(NNI_t) = \alpha_0 + \beta t + Y NNI_{t-1} + d(NNI_t(-1)) + \varepsilon_t \qquad (3)$$

Crops Production Index:
$$d(CPI_t) = \alpha_0 + \beta t + \Upsilon CPI_{t-1} + d(CPI_t(-1)) + \varepsilon_t \qquad (4)$$

Electricity Production from Coal Sources:
$$d(EPCS_t) = \alpha_0 + \beta t + \Upsilon EPCS_{t-1} + d(EPCS_t(-1)) + \varepsilon_t \qquad (5)$$

Final Consumption Expenditures:
$$d(FCE_t) = \alpha_0 + \beta t + \Upsilon FCE_{t-1} + d(FCE_t(-1)) + \varepsilon_t \qquad (6)$$

Gross National Expenditures:
$$d(GNE_t) = \alpha_0 + \beta t + \Upsilon GNE_{t-1} + d(GNE_t(-1)) + \varepsilon_t \qquad (7)$$

Human Capital Index:
$$d(HCI_t) = \alpha_0 + \beta t + \Upsilon HCI_{t-1} + d(HCI_t(-1)) + \varepsilon_t \qquad (8)$$

The current article investigates the association among the variables using the ARDL model. If some constructs are stationary at $1(0)$ and some are stationarity at $1(1)$, then the ARDL model is the best option. In addition, the ARDL model is also the right choice for small samples (Sharif, Baris-Tuzemen, Uzuner, Ozturk, & Sinha, 2020) as this article has only 30 observations. Finally, the ARDL model provides the short- and long-run associations among constructs altogether. The equation for the ARDL regression is given as:

$$\Delta NNI_t = \alpha_0 + \sum \delta_1 \Delta NNI_{t-1} + \sum \delta_2 \Delta CPI_{t-1} + \sum \delta_3 \Delta EPCS_{t-1} + \sum \delta_4 \Delta FCE_{t-1} +$$
$$\sum \delta_5 \Delta GNE_{t-1} + \sum \delta_6 \Delta HCI_{t-1} + \varphi_1 NNI_{t-1} + \varphi_2 CPI_{t-1} + \varphi_3 EPCS_{t-1} + \varphi_4 FCE_{t-1} +$$
$$\varphi_5 GNE_{t-1} + \varphi_6 HCI_{t-1} + \varepsilon_1 \qquad (9)$$

In the above-mentioned equation, δ_1, δ_2, δ_3, δ_4 and δ_5 represent the coefficients for the short-term relationships among the constructs, while φ_1, φ_2, φ_3, φ_4, φ_5 and ε_1 represent the coefficients for the long-term relationships and the error term, respectively.

4. Study Findings

This study used descriptive statistics to show the means, standard deviations, number of observations, and minimum and maximum values (see Table 2). The results indicate that the mean value of NNI was 5.763%, while the average value of CPI was 76.319%. In addition, the findings also exposed that the mean value of EPCS was 35.982%, while the average value of FCE was 32.652%. Finally, the findings also revealed that the average value of GNE was 43.665% and the mean value of HCI was 77.873%.

Table 2.
Descriptive statistics.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
NNI	30	5.763	2.887	4.872	9.736
CPI	30	76.319	5.872	65.625	85.812
EPCS	30	35.982	2.871	32.981	47.242
FCE	30	32.652	3.872	29.092	44.763
GNE	30	43.665	3.762	33.762	54.934
HCI	30	77.873	5.872	75.983	86.983

Moreover, the current study also ran a correlation matrix to show the directional linkage among the variables. The results in Table 3 exposed that the CPI, EPCS, FCE, GNE, and HCI have a positive association with the NNI.

Table 3.
Matrix of correlations.

Variables	NNI	CPI	EPCS	FCS	GNE	HCI
NNI	1.000					
CPI	0.674	1.000				
EPCS	0.509	0.549	1.000			
FCE	0.452	0.655	0.436	1.000		
GNE	0.412	-0.427	0.320	0.430	1.000	
HCI	0.498	0.447	0.437	0.632	0.543	1.000

In addition, the stationarity of the constructs was examined using the ADF test. The results highlighted in Table 4 reveal that NNI, EPCS and GNE are stationary at level. In contrast, the results also exposed that CPI, FCE and HCI are stationary at first difference. Hence, the results confirm that the ARDL model is suitable.

Table 4.
Unit root test.

Augmented Dickey–Fuller Test (ADF)	Level	T-Statistic	P-value
NNI	I(0)	-2.872	0.035
CPI	I(1)	-7.832	0.000
EPCS	I(0)	-2.563	0.041
FCE	I(1)	-6.623	0.000
GNE	I(0)	-2.662	0.039
HCI	I(1)	-5.854	0.003

The results shown in Table 5 related to the short-run association using the ARDL model reveal that production and consumption capabilities and human capital capacity are significantly and positively linked with the national wealth of China. In addition, the R-squared (0.538) also exposed that 53.8% of variations in NNI are due to all the predictors used in the study.

Table 5.
Short-run coefficients.

Variable	Coefficient	Std. Error	T-Statistic	Prob.
D(CPI)	0.794	0.298	2.657	0.038
D(EPCS)	1.094	0.452	2.415	0.043
D(FCE)	4.583	1.564	2.931	0.027
D(GNE)	1.383	0.393	3.519	0.002
D(HCI)	1.654	0.654	2.529	0.041
CointEq(-1)	-1.387	0.156	-8.851	0.000
R-squared	0.538	Mean dependent var		-0.044
Adjusted R-squared	0.519	S.D. dependent var		2.234

The results shown in Table 6 related to the long-run association using the ARDL model revealed that production and consumption capabilities and human capital capacity are also significantly and positively linked with the national wealth of China.

Table 6.
Long-term coefficients.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI	1.493	0.498	2.997	0.032
EPCS	4.872	1.437	3.391	0.003
FCE	1.543	0.436	3.538	0.002
GNE	3.488	0.674	5.172	0.001
HCI	2.687	0.874	3.076	0.005
C	0.983	0.464	2.122	0.041

5. Discussions

The results from this research have shown that the crops production index (CPI), which indicates the production capacity, has a positive relation to the national wealth of a country. These results agree with Rashed & Hassan (2019) and show that when physical and human resources have high production capability, have the optimal production of crops which are good for a healthy environment, and meet the basic crops commodity objectives, they surely contribute to the national wealth.

These results match with those obtained by Kapoor et al. (2020), which revealed that agriculture technologies with high production capabilities facilitate the production of different food and non-food crops and provide the material and energy resources for different firms. Thus, the production capabilities in agriculture enhance the national wealth. The results also indicate that electricity production from coal resources has a positive relation to the national wealth of a country. These results agree with Al-Zareer, Dincer, & Rosen (2018), which show that the capability of coal-fired plants of generating maximum electricity from the consumption of a small quantity of coal, on the one hand produces more electricity which helps run the economic processes and create national wealth and, on the other hand, with the reduction of coal combustion, the improved quality of work environments creates sustainability in the national wealth.

The results show that FCE, which indicates the consumption capability, has a positive relation to the national wealth of a country. These results agree with Wu et al. (2019) and indicate that the capability of the resident institutions, both households and enterprises, of purchasing goods or services with the intention of fulfilling their needs optimally shows that economic activities are producing these goods and services. Thus, an increase in the FCE means an increase in the national wealth. The results have shown that GNE, which indicates the consumption capability, has a positive relation to the national wealth of a country.

These results match with Akinlo & Oyeleke (2018) and highlights that an increase in expenditures by households, enterprises and governments for acquiring goods or services to perform different activities and the consumption of cash or goods for investment purposes enhances the national income. These results indicate that the human capital index has a positive relation to the national wealth of a country and are in line with Zhang et al. (2021) and suggest that an increase in human capital through improved education, health and professional training adds talented, skilled, trained and experienced labor force to the economy. Such labor force helps the national wealth to grow through better economic management and efficient performance of economic activities.

This study is considered significant to developing countries such as China and has several empirical implications. The government can use the results of this study as a guide to focus on human capital creation and development and encourage improvement in production and consumption capabilities through effective policies and strategies to increase national wealth, leading to social and economic well-being. Similarly, this study can guide individual economic units on how they can contribute to the national wealth through the policies which promote production capabilities, consumption capabilities, and human capital.

6. Conclusions

The aim of this study was to check the extent to which production capabilities, consumption capabilities and human capital are influential in increasing China's national wealth. A quantitative research technique was used to examine CPI and EPCS for production capabilities, FCE and GNE for consumption capabilities, and human capital in the economy of China and their impact on China's national wealth. The results of the empirical analysis showed a positive relationship among CPI, EPCS, FCE, GNE, human capital and national wealth.

The results revealed that when the resources used on the land have a high production capability, they produce optimal crops that are beneficial for the environment, achieve the basic objectives of the crop commodities, and thereby contribute to national prosperity. The ability of coal-fired plants to generate maximum electricity from a small amount of coal results in more production of electricity creating national wealth, and the reduction of coal combustion results in a better quality work environment, which creates national wealth sustainability. The results also revealed that the consumption capabilities of individuals, institutions and governments, indicated by FCE and GNE, increase the country's national income. Similarly, the improvement in human capital assets, such as education, experience and skills, improves economic activities and enhances national wealth.

7. Limitations

In this study, only three factors were examined for their influence on the national wealth of China—production capabilities, consumption capabilities, and human capital. The analysis of the roles of a limited number of factors has confined the scope of the study and raised questions regarding its validity. Future research should examine the change in national wealth using a greater number of factors.

China is a fast emerging economy that has large capital, huge labor, and rapid development in science and technology. As China differs from other countries in many ways, the results of the study on China's national wealth improvement based on production capabilities, consumption capabilities and human capital is not equally valid for all countries; therefore, future research should focus on multiple countries for the analysis of national wealth.

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All authors contributed equally to the conception and design of the study.

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