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What Is the Mechanism of Resource Dependence and High-Quality Economic Development? An Empirical Test from China

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Abstract: For a long time, the resource curse had been widely concerned by researchers all over the world, especially in China. At present, China is in the transition stage from high-speed economic growth to high-quality development, and innovation and talents are important drivers. However, the existing research lacked an empirical test on resource curse and its transmission mechanism at the provincial level in China at this stage. In order to test the mechanism of transformation and upgrading of resource-based regions in the period of high-quality economic development, this study used the panel data of 30 provincial administrative regions of Chinese mainland (not including Tibet) from 2007 to 2017 to build a multi-step, multi-mediation model, and explored the direct and indirect impact mechanism of resource dependence on the high-quality economic development using the bootstrap method and generalized least square method. The key findings of this study were as follows: (1) The high-quality economic development level in the central and western provinces of China had been in a backward position compared with the eastern provinces. (2) There was a "resource curse" in the stage of high-quality economic development at the provincial level in China. (3) In terms of transmission mechanism, resource dependence had a negative impact on the high-quality economic development through the crowding-out effect of innovation investment and talents. Our conclusion provides a theoretical reference for other countries and regions to explore the relationship between resource dependence and high-quality economic development and may inform the economic development strategies by policymakers that wish to transform and upgrade the resource-based regional economy.

Keywords: resource dependence; high-quality economic development; innovation investment; talent gathering; multi-step; multi-mediation model

1. Introduction

Natural resources, as a necessary input in the process of material production, have extremely important economic value and have always been regarded as a symbol of wealth and growth. The United States, Germany, Canada and other economies realized industrialization quickly and have maintained a sustained period of economic growth; one of the important conditions is to have abundant natural resources [1]. However, the economic growth of countries which are also rich in natural resources, such as Venezuela and Nigeria, is very slow or even stagnant. Moreover, as a developed country, the Netherlands also experienced an unprecedented economic crisis in 1980s because of its excessive dependence on natural gas export industry, which caused other manufacturing sectors to shrink. This phenomenon, which hinders economic growth due to excessive dependence on natural resources, is called "resource curse". In China, this also exists [2,3].

The existing literature focuses on the relationship between resource dependence and economic growth. However, China's economy has changed from a high-speed growth to a high-quality development stage [4–6]. This means that, on the one hand, the traditional extensive economic growth mode with high input, high consumption, high pollution and low efficiency is gradually being abandoned; on the other hand, China's economic development is shifting from focusing on quantity to improving quality, from factor and investment driven to innovation and talent driven. In addition, "high-quality economic development" is different from the previous "quality of economic growth". Although both pay more attention to the quality of economic development rather than the speed, the differences are as follows: first, "high-quality economic development" has richer connotations than "quality of economic growth", which put more emphasis on the coordination and unification of quality and quantity; second, "high-quality economic development" has more distinct characteristics of the times [7].

The resource curse not only brings negative effects on the speed of economic growth, but also causes a series of ecological and social welfare problems, such as environmental pollution and income inequality, which runs counter to the goal of high-quality economic development. At present, China's resource-based regions are facing serious transformation problems caused by environmental deterioration and resource exhaustion. How to promote high-quality transformation of resource-based regions is an important research direction of economic and social development in the new era [8,9]. Traditional resource curse theory mainly analyzes its transmission mechanism from three aspects: "Dutch disease" effect, institutional weakening and crowding-out effect on technology and human capital, and attempts to find a solution [10,11]. However, for high-quality economic development, innovation is the first driving force and talent is the first resource [12]. Will resource-based regions indirectly affect the high-quality economic development through innovation investment and talent gathering? If so, what measures should the resource-based region take to promote its high-quality transformation? The solution to the above problems has the following meanings. (1) This study enriches and expands the Resource Curse Theory and the theory of high-quality economic development, and it provides a theoretical basis for promoting the high-quality development of China's resource-based regional economy; (2) Further research on the transmission mechanism of "resource curse" in the new stage has a certain practical value for narrowing the gap of economic development in China and promoting the high-quality development of the resource-based regional economy; (3) This study directly arouses researchers' attention to environmental resources, which is conducive to the further study of the sustainability of environmental resources; (4) Although this study is based in China, as a typical developing country, the results of this paper will provide reference for other countries or regions. For example, are the mechanisms of resource dependence and high-quality economic development homogeneous or heterogeneous in other developing countries in a situation similar to that in China? What about developed countries? The methods and indicators used in this study can be used for reference to the relevant research in other countries or regions.

In order to test China's resource curse and its transmission mechanism at the provincial level in the new stage of high-quality economic development, this paper uses the panel data of 30 provinces (cities and autonomous regions) of the Chinese mainland (not including Tibet) from 2007 to 2017 to construct an evaluation index system for high-quality economic development. Then, with the investment of innovation and talent gathering as the breakthrough point, we first integrate resource dependence and economic quality development into a whole research framework, and use multi-step, multi-mediation model to study it. Finally, targeted suggestions are put forward to promote the high-quality development of resource-based regional economy.

The remaining chapters of this paper are arranged as follows. Section 2, literature review and hypotheses, which reviews the relevant literature from three aspects (i.e., resource dependence and high-quality economic development, analysis of transmission mechanism based on innovation investment and talent gathering, and the chain mediation), and gives seven hypotheses. Section 3, Methodology and Data, introduces the methodology, variable selection, and data source. Section 4, Results and Discussion, reports the research results and discussion from three aspects (i.e., the measurement of high-quality economic development, the unit root test of panel data, and the mediating effect of innovation investment and talent gathering). The last section provides our conclusions and policy recommendations.

2. Literature Review and Hypotheses

2.1. Resource Dependence and High-Quality Economic Development

The American economist Auty was the first to put forward the theory of "resource curse". When he analyzed the case of resource-exporting countries in 1993, he found that the economic growth of most resource-rich countries was slower than that of resource-poor countries [13]. In other words, abundant natural resources were not an advantage but a restriction on economic growth in some countries. The proposal of this theory had aroused widespread concern in academic circles at home and abroad, and scholars had come to different conclusions. The first was that there was a "resource curse". Some researchers [14–17] found a significant negative correlation between natural resource dependence (oil abundance) and economic growth through empirical tests. Sadik-Zada and Loewenstein found rapacious rent seeking in oil-rich countries, which is prone to resource curses, but well-functioning democratic institutions can prevent this from happening [18]. The second was that there was no "resource curse". Arin and Braunfels [19] did not find empirical evidence of "natural resource curse" when using panel data. Hilmawan and Clark [20] conducted a study on Indonesia, one of the largest resource producers in Asia, and found that there was no "resource curse" in Indonesia. On the contrary, resource dependence was positively correlated with regional per capita income. Sadik-Zada et al. [21] believed that the oil and gas sector can fuel Gross Domestic Product (GDP) and employment over reinvestment of the petroleum windfalls. He also found that natural resources are not a curse for Kazakhstan's economy [22]. The third was the conditional "resource curse", which was the occurrence of the "resource curse" was related to certain factors, such as institutional quality [23], human capital and economic openness [24], and national macroeconomic and political system [25]. Sadik-Zada found that in combination with a lower level of political freedom, oil abundance had a strong, negative, long-term impact on economic modernization [26].

In recent years, with the attention of all sectors of society to economic and environmental issues, the research on "resource curse" has begun to extend to the environmental and social fields. On the one hand, resource-based areas mainly rely on the development and utilization of resources to promote economic development, which definitely have a negative impact on the environment. Therefore, compared with non-resource-based regions, resource-based regions face more serious resource and environmental problems, hindering the growth of green economy [27]. On the other hand, due to the long-term problems such as weak economic growth and environmental degradation, their poverty population and unemployment rates are also relatively high, which can easily lead to a series of social problems [28]. At the same time, excessive profits in the resource industry will exacerbate income inequality [29]. To sum up, the "resource curse" exists not only in the economic field, but also in the environmental and social fields, which is contrary to the high-quality economic development. Therefore, the following hypothesis is proposed:

Hypothesis 1 (H1). *Resource dependence negatively affects high-quality economic development.*

2.2. Analysis of Transmission Mechanism Based on Innovation Investment and Talent Gathering

Sadik-Zada et al. [30] integrated all the major transmission channels of the resource curse and identified sector structure as the primary cause of the resource curse. Compared with the manufacturing sectors, the mining sectors mainly focus on the development of resources and the production of primary products. The products are homogeneous, and the demand for technological progress and high-quality talents is low [31,32]. At the same time, the high profit of mining sectors makes local people satisfied with the wealth brought by relying on resources, thus weakening the manufacturing sectors with the effect of "learning by doing" [33], leading to the reduction of innovation investment and the loss of talents. Sadik-Zada and Gatto also found that abundant oil resources will lead to the decline of manufacturing output [34]. In addition, a number of scholars have verified the crowding-out effect of resource dependence on technological innovation and human capital through empirical research [35,36]. Therefore, the following hypotheses are proposed:

Hypothesis 2 (H2). *Resource dependence negatively affects innovation investment.*

Hypothesis 3 (H3). *Resource dependence negatively affects talent gathering.*

On the relationship between innovation and economic growth, Schumpeter's innovation theory held that innovation is the fundamental driving force for economic and social development [37]. Romer [38] explained Schumpeter's "creative destruction" by using the horizontal technological innovation model, and clarified the positive impact of technological input on economic growth. Other scholars studied the relationship between innovation investment and green economy growth, and found that the scale of R&D investment was not conducive to green economy growth in the short term, but had a positive impact in the long run [39]. Zhou et al. [40] introduced the government's preference for technological innovation into the neoclassical economic growth model, and concluded that technological innovation preference may achieve high-quality economic growth in the long run.

On the relationship between talent and economic growth, Romer [41] emphasized the role of human capital in economic growth in endogenous growth theory. Subsequently, scholars conducted a large number of empirical studies, proving that human capital was a key driving force of economic growth [42–45]. When studying the relationship between natural resources and economic growth, human capital, as one of the transmission mechanisms, plays a significant role in promoting economic growth [46]. In addition, high-quality education can enhance human capital and then promote economic growth [47], which means that talents cultivated by high-quality education have a positive impact on economic growth. Therefore, innovation and talent are the driving forces of economic growth, the following hypotheses are proposed:

Hypothesis 4 (H4). *Innovation investment positively affects the high-quality economic development.*

Hypothesis 5 (H5). *Talent gathering positively affects the high-quality economic development.*

2.3. The Chain Mediating Role of Innovation Investment and Talent Gathering

According to Maslow's hierarchy of needs theory, talents are not satisfied with low-level needs such as survival and safety, but need to be respected and realize self-worth and pursue a higher quality of life [48]. As the soft factors of urban development, innovation ability and economic development level make it possible for talents to enjoy the atmosphere of innovation and entrepreneurship, gain more development space and enjoy a high-quality life. Zhang et al. [49] studied the influencing factors of talent gathering and found that innovation investment was significantly positively correlated with talent gathering degree. Furthermore, abundant natural resources per se will not have a negative impact on high-quality economic development, but because of excessive dependence on natural resources, the economy invest a large amount of resources into resources sector, ignoring the investment in innovation, education and other aspects, which hinder the technological progress and talent gathering, inhibiting high-quality economic development [50,51]. Therefore, the following hypotheses are proposed:

Hypothesis 6 (H6). *Innovation investment positively influences talent gathering.*

Hypothesis 7 (H7). *Innovation investment and talent gathering have a chain mediating effect between resource dependence and high-quality economic development.*

On the basis of above discussion, we find some limitations of existing studies. First, scholars mainly focus on verifying the existence of "resource curse" and their conclusions are controversial. One of the reasons may be that the research samples selected by different scholars are in different economic development levels or stages, and countries at different stages of economic development have different thresholds of environmental degradation [52], which may lead to different effects of resource dependence on them. China is now in the stage of rapid economic growth to high-quality development. In this new stage, does the "resource curse" still exist at the provincial level? The existing literature cannot give an answer. Secondly, studies on the transmission mechanism of the "resource curse" all start from the "Dutch disease" affect, institutional quality, insufficient educational investment and crowding-out effect on technological progress. The analysis perspective has strong limitations. However, innovation and talents, as the important driving force of high-quality economic development in China, are of great significance in breaking the "resource curse". Existing researches lack empirical tests on this transmission mechanism. Therefore, the contributions of this work are as follows: based on the new stage of high-quality economic development of China, taking innovation input and talent gathering as the breakthrough point, this paper studies the direct and indirect effects of resource dependence on high-quality economic development in China by using the multi-step, multi-mediation model, in order to enrich and expand relevant research content.

3. Methodology and Data

3.1. Methodology

According to the previous hypotheses, this paper constructs a multi-step, multi-mediation model to test whether there is chain mediating effect between resource dependence and high-quality economic development. The multi-step, multi-mediation model, also known as the chain mediating model, means that there are sequential influences among multiple mediation variables to form a mediating chain [53]. This paper argues that innovation investment may have an impact on talent gathering; therefore, the multi-step, multi-mediation model is constructed to test. See Figure 1 for the theoretical framework, and the econometric models are as follows:

$$HQED_{it} = \alpha HQED_{it-1} + cRD_{it} + \sum_{k=1}^{3} \beta_k X_{ikt} + \mu_{it} \tag{1}$$

$$Inno_{it} = a_1 RD_{it} + \sigma_{i1t} \tag{2}$$

$$Tagg_{it} = a_2 RD_{it} + d_{21} Inno_{it} + \sigma_{i2t} \tag{3}$$

$$HQED_{it} = \alpha' HQED_{it-1} + c' RD_{it} + b_1 Inno_{it} + b_2 Tagg_{it} + \sum_{k=1}^{3} \beta'_k X_{ikt} + \tau_{it} \tag{4}$$

where $HQED_{it}$ represents the level of high-quality economic development; RD_{it} represents resource dependence; $Inno_{it}$ and $Tagg_{it}$ are mediation variables, which respectively represent the intensity of innovation investment and the level of talent gathering. In order to eliminate other factors influencing the level of high-quality economic development, four control variables were included in regression: financial development (*Fin*), government intervention (*Gov*), private economic development (*Pri*) and urbanization (*Urb*), which were represented by X_k (k = 1~4). I and t represent the provinces and time; μ_{it}, σ_{i1t}, σ_{i2t} and τ_{it} represent random error term. C represents the total effect of resource dependence on high-quality economic development; c' represents the direct effect of resource dependence on high-quality economic development; $a_1 b_1$ and $a_2 b_2$ represent two independent mediating effects of resource dependence on high-quality economic development; $a_1d_{21}b_2$ represents a chain mediating effect.

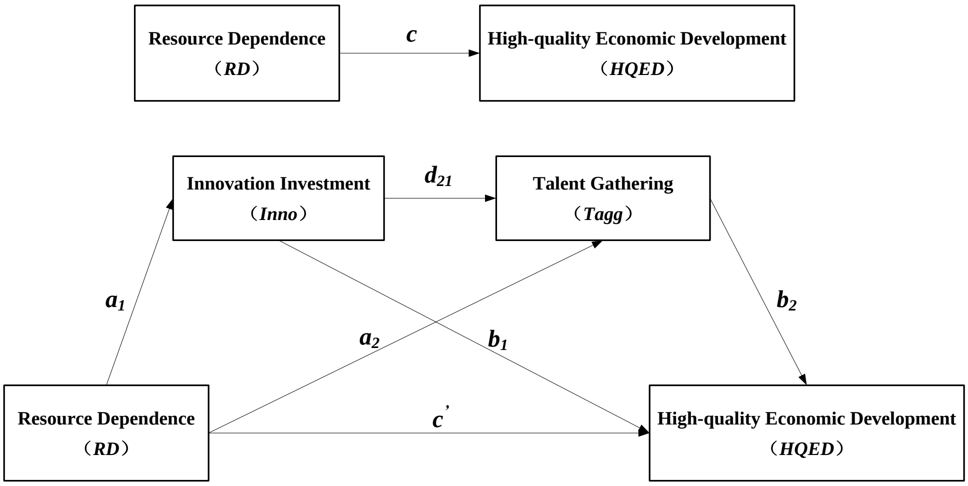

Figure 1. Theoretical framework.

The estimation methods used in this paper are the bootstrap method and generalized least square method (GLS). According to the research of Hayes [54], the common mediating effect test methods, such as Sobel test, have great limitations in analyzing multiple mediation models. Firstly, Sobel test requires that specific mediating effects and total mediating effects in the model obey normal distribution. Secondly, Sobel test requires large samples. Thirdly, the statistical calculation of Sobel test is very complicated and needs manual calculation. In order to solve the above problems, the better method to test the multiple mediation models is the bootstrap method. When calculating the multi-step, multi-mediation model, the confidence interval of coefficient product is more accurate than that obtained by Sobel method, and it has higher test power [55,56]. At the same time, because the panel data contain both time series data and cross-section data, it is easy to have heteroscedasticity or autocorrelation, and the generalized least square method can reduce the linear correlation between variables and the influence of heteroscedasticity. Therefore, we use the generalized least square method and bootstrap method to test the multi-step, multi-mediation model.

3.2. Variable Selection

3.2.1. High-Quality Economic Development (HQED)

"High-quality economic development" was put forward for the first time at the 19th National Congress of the Communist Party of China. At present, many scholars interpret the connotation of high-quality economic development and try to measure it, which can be divided into two types. First, use a single index, such as total factor productivity (TFP) [57]. Obviously, a single variable cannot comprehensively and accurately cover the rich connotation of high-quality economic development. The second is to adopt a multi-index comprehensive evaluation method, such as selecting indicators from three aspects of economy–ecology–society to measure the high-quality economic development level [58,59]. Therefore, there is no unified definition and clear measurement index system for high-quality economic development in academic circles at present. Based on the research of Xu et al. [60], this paper holds that high-quality development is a development that fully embodies the five new development concepts of innovation, coordination, green, openness and sharing, and can well meet the growing needs of people for a better life. At the same time, following the principles of scientificity and data availability, we construct an evaluation index system for high-quality economic development from five aspects: innovation driven, economic coordination, green development, opening up and achievement sharing, as shown in Table 1.

Table 1. High-quality economic development evaluation index system.

Dimensions	Sub-Index	Basic Indicators	Proxy Variables
Innovation driven	Innovation effectiveness	The number of invention patents granted per 10,000 people	The number of invention patents granted/Total population × 10,000
		Transaction value in technical market/GDP	Transaction value in technical market/GDP
	Innovation efficiency	Average GDP per mu	GDP/Construction land area
		Total factor productivity (TFP)	TFP
Economic coordination	Economic growth	Speed	Reporting period GDP/base period GDP (constant price)
		Quality	Per capita GDP
	Urban-rural coordination	Two yuan contrast coefficient	Two yuan contrast coefficient
		Binary contrast index	Binary contrast index
		Urban/rural income ratio	Per capita disposable income of urban residents/per capita disposable income of rural residents
		Urban/rural consumption ratio	Urban/rural consumption ratio
	Industrial structure	Industrial structure rationalization (ISR)	ISR
		Advanced industrial structure (AIS)	AIS
	Investment & consumption structure	Investment rate (IR)	IR
		Consumption rate (CR)	CR
		Investment consumption ratio	Investment/Consumption
Green development	Ecological environment condition	Proportion of cultivated land area	Cultivated land area/total area
		Coverage rate of nature reserves	Area of nature reserve/area under its jurisdiction
		Forest coverage rate	Forest coverage rate
		Air quality status	SO_2 and smoke (powder) emissions
	Pollution treatment	Treatment rate of consumption wastes	Treatment rate of consumption wastes
		Sewage treatment rate	Sewage treatment rate
	Resource consumption	Energy consumption per unit GDP	Coal consumption/GDP
		Electricity consumption per unit GDP	Electricity consumption/GDP
Opening up	National opening	Dependence on foreign trade	Total imports and exports/GDP
		Dependence on foreign tourism	International tourism income/GDP
		Dependence on foreign technology	The amount of contract for the introduction of foreign technology/GDP
	Provincial opening	Market activity	Total retail sales of social consumer goods/GDP
		Dependence on domestic tourism	Domestic tourism income/GDP
		Freight density	Freight turnover/total length of transport lines
		Passenger density	Passenger turnover/total length of transport lines
Achievement sharing	Infrastructure	Per capita road area	Per capita road area
		Number of buses per 10,000 people	Number of buses/ Total population × 10,000
		Number of Internet users per 10,000 people	Number of Internet users/Total population × 10,000
	Public services	Number of college students per 10,000 people	Number of college students/Total population × 10,000
		Number of beds in medical institutions per 10,000 people	Number of beds in medical institutions/Total population × 10,000
		Number of public libraries and museums per 10,000 people	(Number of public libraries and museums)/Total population × 10,000
	People's living conditions	Tourism Engel coefficient of urban residents	[(Transportation and Communication + Culture, Education and Entertainment + Health Care and Medical service)/Consumption expenditure] × 100%
		Tourism Engel coefficient of rural residents	[(Transportation and Communication + Culture, Education and Entertainment + Health Care and Medical service)/Consumption expenditure] × 100%
		Social unrest index	Unemployment Rate + Consumer Price Index (CPI)

In this paper, entropy method is used to standardize the data, determine the index weight, determine the scores of five dimensions, and finally calculate the total score. Entropy method is an objective weighting method, which uses information entropy tool to measure the variation degree of each index, thus calculating the weight of each index and comprehensively evaluating the multi-index system. The calculation steps are as follows.

1. Establish the judgment matrix of index data $\{X_{ij}\}_{m\times n}$, where X_{ij} is the j index value of the ith province.
2. Carry out dimensionless treatment on the indexes. Positive indicators: $X_{ij} = \frac{x_{ij}-\min(x_{ij})}{\max(x_{ij})-\min(x_{ij})}$; Negative indicators: $X_{ij} = \frac{\max(x_{ij})-x_{ij}}{\max(x_{ij})-\min(x_{ij})}$.
3. Quantify the index in the same degree, and calculate the proportion Y_{ij} of the ith province in the index under the j index: $Y_{ij} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}}$, where m represents the number of cities.
4. Calculate the entropy e_j of index j: $e_j = -k\sum_{i=1}^{m} Y_{ij} \ln Y_{ij}$, where $k = \frac{1}{\ln(n)}, e_j \geq 0$.
5. Calculate the index difference coefficient d_j of index j: $d_j = 1 - e_j$.
6. Calculate the weight w_j of the j index: $w_j = \frac{d_j}{\sum_{j=1}^{n} d_j}$.
7. Calculate the total evaluation index $U_s(s = 1, 2, 3, 4, 5)$ of five subsystems: $U_s = \sum_{j=1}^{n} w_{sj}u_{sj}$, where w_{sj} is the weight of index j of s subsystem and u_{sj} is the value of index j of s subsystem.

3.2.2. Resource Dependence (RD)

Resource dependence means that a region relies on the comparative advantages of its natural resources, especially mineral resources, and vigorously develops resource-based industries as the main pillar of economic development. The relevant research results of resource dependence are very fruitful, and scholars at home and abroad have different measurement indicators for resource dependence, which are mainly divided into the following categories: the proportion of fixed assets investment in mining sector to the total fixed assets investment of the whole society [61], the number of employees in mining sector to the total number of employees [62,63], the proportion of natural resources rent in GDP [64], and the proportion of primary products exports in GDP [23]. Under the statistical caliber of the Chinese industry, the investment of the mining sector depends entirely on the availability of natural resources. Compared with areas with poor natural resources, resource-rich areas are more inclined to invest in resource-based industries. Therefore, we use the proportion of fixed assets investment in mining sector to the total fixed assets investment of the whole society to measure the degree of resource dependence.

3.2.3. Mediating Variables

Innovation investment (*Inno*). Referring to the research of Yang et al. [65] on innovation investment, innovation investment is divided into capital investment and personnel investment. Capital investment is measured by R&D expenditure, personnel investment is measured by R&D full-time equivalent, and the comprehensive index of both is calculated by entropy method to represent innovation investment.

Talent gathering (*Tagg*). Talents refer to those with higher education level in human resources, which are usually represented by the population with bachelor degree or above [66]. Meanwhile, referring to the talent location entropy method used by Cao et al. [67] to measure talent gathering, we use the proportion of the number of employees with a bachelor degree or above in each region to the total number of employees in the region divided by the proportion of the number of employees with a bachelor degree or above in the country in the total number of employees to represent talent gathering.

3.2.4. Control Variables

According to the existing research, four control variables selected in this paper. Financial development level (*Fin*) is measured by the proportion of balance of RMB loans in financial institutions to GDP. Government intervention degree (*Gov*) is measured by the proportion of general public budget expenditure to GDP. Private economic development (*Pri*) is measured by the proportion of self-employed individuals and private enterprises employees to total employees. Urbanization level (*Urb*) is measured by the proportion of urban population to the total population.

3.3. Data Source

Considering the availability of samples, this study selected 30 provinces (cities and autonomous regions) in Chinese mainland (not including Tibet) as research samples, from 2007 to 2017. Data mainly come from China Statistical Yearbook, China Science and Technology Statistical Yearbook, China Labor Statistical Yearbook, China Environmental Statistical Yearbook and statistical yearbooks of various provinces and cities. In view of the lack of some data, we use linear interpolation method to fill this gap. In order to reflect the change of the actual level, we use the GDP deflator of each province to adjust the economic data to the constant price in 2007. Descriptive statistics of variables are shown in Table 2.

Table 2. Descriptive statistics.

Variable	Observations	Mean	SD	Max	Min
HQED	330	0.256	0.165	0.075	0.979
RD	330	0.041	0.043	0.000	0.259
Inno	330	0.249	0.268	0.000	1.000
Tagg	330	1.235	1.151	0.357	8.439
Fin	330	1.168	0.393	0.533	2.371
Gov	330	22.762	9.733	8.744	62.686
Pri	330	0.186	0.107	0.037	0.589
Urb	330	54.074	13.487	28.240	89.600

4. Results and Discussion

4.1. Measurement of High-Quality Economic Development

Due to the large sample size of the measured results, in order to more directly reflect the changes of high-quality economic development level of 30 provinces (cities and autonomous regions) in the Chinese mainland (not including Tibet) from 2007 to 2017, we use color chart to express the final results (Figure 2). On the whole, the high-quality economic development level of Beijing, Tianjin and Shanghai is significantly higher than that of other regions in the 11 years. Among them, Beijing has the highest level of high-quality economic development, and its value is close to 1, which plays a leading role in the process of high-quality economic development in the country; Shanghai and Tianjin ranked second, with values higher than 0.4. This result is consistent with the findings of Ma et al. [7]. According to the time trend, the high-quality economic development level of all provinces (cities and autonomous regions) in China is generally on the rise. In terms of years, from 2007 to 2009, the high-quality development level in various regions of China was low, among which, the high-quality development level of Hebei, Shanxi, Guizhou, Gansu, Ningxia and Xinjiang was less than 0.15, which was about 0.8 lower than that of Beijing. It can be seen that the high-quality development level of China was unbalanced. From 2010 to 2017, the high-quality economic development level of other regions increased, except for a small fluctuation in some provinces. In 2017, the top ten provinces in China's high-quality economic development level were Beijing, Shanghai, Zhejiang, Tianjin, Chongqing, Jiangsu, Guangdong, Shaanxi, Qinghai and Fujian, including 7 eastern provinces and three western provinces: Ningxia, Sichuan, Guangxi, Xinjiang, Guizhou, Hebei, Jiangxi, Inner Mongolia, Shanxi and Gansu are ranked in the bottom 10 including 1 eastern province, 2 central provinces and 7 western provinces. This shows that the high-quality economic development level of the central and western provinces is in a backward position compared with the eastern provinces, and there is still greater room for high-quality development and improvement. This result is similar to the findings of Xiong et al. [68], but there are slight differences between the top ten provinces and the bottom ten provinces, which may be due to the different measurement indicators of high-quality economic development level selected in this paper.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Beijing	0.9792	0.9482	0.9762	0.9675	0.9721	0.9508	0.9630	0.8998	0.8988	0.9050	0.9279
Tianjin	0.5013	0.5291	0.5139	0.5659	0.5085	0.5249	0.5453	0.4700	0.4586	0.4822	0.4305
Hebei	0.1170	0.1170	0.1283	0.1752	0.1495	0.1580	0.1470	0.1583	0.1670	0.1795	0.2082
Shanxi	0.0987	0.0849	0.1162	0.1902	0.1395	0.1551	0.2086	0.1557	0.1782	0.1853	0.1852
Inner Mongolia	0.1485	0.1810	0.2034	0.2017	0.1885	0.1922	0.2200	0.1967	0.2570	0.2749	0.2012
Liaoning	0.2589	0.2960	0.2875	0.3709	0.3211	0.3103	0.3445	0.2772	0.2835	0.2860	0.2774
Jilin	0.2114	0.2695	0.2775	0.3346	0.2992	0.2962	0.2867	0.2254	0.2658	0.3287	0.2777
Heilongjiang	0.1517	0.1737	0.2155	0.2791	0.2331	0.2391	0.2797	0.2004	0.2491	0.2969	0.2621
Shanghai	0.6464	0.6229	0.6287	0.6437	0.5415	0.5459	0.5069	0.5027	0.4992	0.5549	0.5325
Jiangsu	0.2989	0.3001	0.3133	0.3900	0.3621	0.3936	0.4138	0.3414	0.4203	0.4116	0.4009
Zhejiang	0.3141	0.3191	0.3331	0.4275	0.3835	0.3984	0.4283	0.3503	0.4269	0.4507	0.4356
Anhui	0.1484	0.1473	0.1447	0.2219	0.2117	0.2114	0.1984	0.1528	0.1795	0.1789	0.2494
Fujian	0.2533	0.2755	0.2660	0.3506	0.2895	0.3149	0.3344	0.2594	0.2648	0.3132	0.3345
Jiangxi	0.1568	0.1817	0.1859	0.2419	0.2336	0.2200	0.1851	0.1277	0.1381	0.1564	0.2065
Shandong	0.1885	0.1829	0.2071	0.2569	0.2165	0.2364	0.2645	0.2057	0.2608	0.2702	0.2771
Henan	0.1237	0.1413	0.1508	0.1892	0.1924	0.1747	0.1610	0.1505	0.1699	0.2003	0.2571
Hubei	0.1703	0.1730	0.1810	0.2255	0.2078	0.2222	0.2651	0.2281	0.2875	0.3041	0.3318
Hunan	0.1635	0.1624	0.1530	0.2128	0.2093	0.2101	0.1935	0.1721	0.1852	0.2083	0.2617
Guangdong	0.2882	0.2689	0.2642	0.3503	0.3089	0.3233	0.3106	0.3156	0.3271	0.3111	0.3791
Guangxi	0.1242	0.1202	0.1650	0.2285	0.2241	0.2026	0.1812	0.1200	0.1417	0.1657	0.2273
Hainan	0.2135	0.2190	0.2372	0.3109	0.2975	0.2786	0.4101	0.2963	0.2880	0.2856	0.2848
Chongqing	0.2015	0.2172	0.2331	0.3361	0.3519	0.3531	0.2936	0.2725	0.2208	0.3039	0.4200
Sichuan	0.1693	0.1592	0.1719	0.2202	0.2180	0.2315	0.2034	0.1516	0.1627	0.1934	0.2331
Guizhou	0.0867	0.0577	0.0758	0.1390	0.1628	0.1387	0.1707	0.1216	0.1201	0.1475	0.2164
Yunnan	0.1545	0.1358	0.1589	0.2509	0.2444	0.2343	0.2432	0.1969	0.2081	0.2465	0.3129
Shaanxi	0.1639	0.2199	0.1943	0.2669	0.2611	0.3144	0.3696	0.3048	0.3363	0.3581	0.3626
Gansu	0.1155	0.0972	0.1113	0.1304	0.1441	0.1665	0.1943	0.1144	0.1486	0.1671	0.1833
Qinghai	0.1573	0.1583	0.1673	0.2197	0.2030	0.2241	0.2943	0.2361	0.3160	0.3968	0.3395
Ningxia	0.0865	0.1048	0.1316	0.1651	0.1035	0.1450	0.2201	0.1742	0.2345	0.3225	0.2431
Xinjiang	0.1137	0.1156	0.1362	0.1466	0.1310	0.1668	0.2153	0.1706	0.2388	0.2729	0.2261

Figure 2. Color chart of high-quality economic development level of 30 provinces (cities and autonomous regions) in the Chinese mainland (not including Tibet) from 2007 to 2017.

4.2. Unit Root Test of Panel Data

In order to avoid the false regression problem caused by non-stationary data, this paper first tests the unit root of each variable to see if it is a stationary series. For the sake of robustness, we use four methods: LLC test, Hadri test, IPS test and ADF-Fisher test, and the test results are shown in Table 3. *HQED* and *Urb* variables all passed LLC test, Hadri test and IPS test at 1% significance level; *Pri* variables passed LLC test, Hadri test and ADF-Fisher test at 10% significance level. All the other variables passed the significance test of all four methods at the level of 5%. Therefore, all variables are integrated, and panel data model regression can be performed.

Table 3. Panel unit root test results.

Variable	LLC Test	Hadri Test	IPS Test	ADF-Fisher Test
HQED	−11.677 ***	5.811 ***	−3.343 ***	66.180
RD	−9.346 ***	8.938 ***	−2.973 ***	80.865 **
Inno	−8.361 ***	10.534 ***	−2.877 ***	108.266 ***
Tagg	−11.666 ***	9.193 ***	−5.028 ***	122.974 ***
Fin	−6.970 ***	10.933 ***	−3.069 ***	126.193 ***
Gov	−15.546 ***	10.629 ***	−2.848 ***	161.069 ***
Pri	−2.151 **	11.192 ***	0.522	74.763 *
Urb	−32.206 ***	10.581 ***	−12.816 ***	61.498

Note: *, **, *** Indicate significant levels of 10%, 5% and 1%, respectively.

4.3. Mediating Effect of Innovation Investment and Talent Gathering

In order to analyze the specific mediating effect of each path, this paper uses Mplus 8.3 to estimate the model, setting the bootstrap sample size as 1000 and estimating method as generalized least square method, and the results are shown in Tables 4 and 5.

Table 4. Model hypothesis test results.

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable	*Inno*	*Tagg*	*Tagg*	*Tagg*	*HQED*	*HQED*	*HQED*	*HQED*
RD	−2.733 *** (0.375)	−0.976 *** (0.176)	−3.387 *** (1.119)		−0.391 *** (0.112)	−0.261 *** (0.035)	−0.567 *** (0.068)	−1.135 *** (0.163)
Inno			0.498 * (0.270)	1.751 *** (0.118)		0.096 *** (0.022)	0.052 *** (0.013)	
Tagg					0.070 *** (0.005)		0.089 *** (0.007)	
Fin					0.027 *** (0.007)	0.071 *** (0.012)	0.027 ** (0.011)	0.055 *** (0.011)
Gov					−0.001 *** (0.000)	−0.001 *** (0.000)	−0.001 ** (0.000)	−0.001 *** (0.000)
Pri					0.181 *** (0.041)	−0.047 (0.070)	0.196 *** (0.063)	0.009 (0.049)
Urb					0.004 *** (0.000)	0.008 *** (0.001)	0.001 ** (0.001)	0.012 *** (0.001)
Obs.	330	330	330	330	330	330	330	330

*, **, *** Indicate significant levels of 10%, 5% and 1%, respectively. The parentheses are standard errors.

Table 5. Bootstrap mediating effect test results.

	Estimate	S.E.	95% Confidence Interval	
			Lower 2.5%	Upper 2.5%
RD → *Inno* → *HQED*	−0.143 ***	0.040	−0.227	−0.072
RD → *Tagg* → *HQED*	−0.303 ***	0.103	−0.522	−0.128
RD → *Inno* → *Tagg* → *HQED*	−0.122 *	0.071	−0.293	−0.008
Total indirect	−0.568 ***	0.145	−0.864	−0.317
Direct	−0.567 ***	0.068	−0.704	−0.435
Total	−1.135 ***	0.163	−1.457	−0.845

Note: *, *** Indicate significant levels of 10% and 1%, respectively.

First of all, Model 1 shows that resource dependence has a significant negative impact on innovation investment, and excessive dependence on natural resources will make the local resource sector dominate and crowd out the manufacturing sector with higher innovation capability and demand, which will reduce the innovation investment in this region [69], which verifies the Hypothesis H2. Model 2 shows that resource dependence has a significant negative effect on talent gathering, resource sectors have low requirements for human capital, and talents cannot get enough attention and reward in resource-dependent areas [70,71], so there will be no high agglomeration effect of talents, which is consistent with Hypothesis H3. Model 8 verifies the total effect of resource dependence on the high-quality economic development, and shows that resource dependence will lead to slow economic development, environmental pollution and social welfare reduction, and hinder the high-quality economic development, which is consistent with Hypothesis H1. The results of models 1, 6 and 8 show that resource dependence will negatively affect the high-quality economic development by reducing innovation investment, which is consistent with Hypothesis H4. The results of models 2, 5 and 8 indicate that resource dependence has a negative effect on the high-quality economic development by crowding out talents, which is consistent with Hypothesis H5. In model 4, innovation investment has a significant positive impact on talent gathering, that is, more innovation investment will attract more talents, which verifies Hypothesis H6. The results of models 1, 3, 7 and 8 verify the chain mediation between resource dependence and high-quality economic development, which is consistent with Hypothesis H7.

Furthermore, we analyze the specific mediating effect of each path. If the confidence interval in Table 5 does not contain 0, it indicates that the mediating effect is significant. It can be seen that the independent mediating effect, chain mediating effect, total indirect effect, direct effect and total effect are all significant, and the influence direction is in line with expectations, that is, all hypothesis are passed. Specifically, the total effect of resource dependence on the high-quality economic development is −1.135, in which the direct effect is −0.567 and the total indirect effect is −0.568, which reflects that resource dependence significantly negatively affects the high-quality economic development, and the ratio of direct effect to total indirect effect is close to 1:1. From the perspective of specific mediating effect, the independent mediating effect of innovation investment between resource dependence and high-quality economic development is −0.143, and it also plays a significant chain mediating effect by affecting talent gathering, with an mediating effect of −0.122, and innovation investment accounts for 46.7% of the total indirect effect; The mediating role of talent gathering is −0.303, accounting for 53.3% of the total indirect effect. These indicate that the "resource curse" in the field of high-quality economic development is mainly caused by the crowding-out effect on innovation investment and talent gathering, which is consistent with the viewpoint of Qian et al. [32] and Cheng [72] that technological innovation and human capital are important transmission mechanisms of "resource curse".

Finally, for the control variables, they are basically in line with expectations. Financial development is an important support and guarantee for high-quality economic development, and they complement each other. Therefore, there is a significant positive correlation between financial development level and high-quality economic development. The influence of government intervention on the high-quality economic development is significantly negative. The possible reason is that resource-based industries seek rent from the government for greater benefits, which leads to blindness and inefficiency caused by excessive government intervention. The development of private economy has a significant positive impact on the high-quality economic development. Because the private economy plays an important role in entrepreneurship and employment, optimizing economic structure, transferring rural surplus labor and expanding exports, it is an important subject to promote high-quality economic development. Urbanization level has a significant positive impact on the high-quality economic development. Urbanization means population gathering in cities, gradual improvement of urban infrastructure, rapid industrial development and intensive utilization of rural land, which makes various resources optimally allocated and plays an important role in high-quality economic development.

5. Conclusions and Policy Recommendations

5.1. Conclusions

Based on the panel data of 30 provinces (cities and autonomous regions) in the Chinese mainland (not including Tibet) from 2007 to 2017, this paper explores the direct influence mechanism of resource dependence on the high-quality economic development and the indirect influence mechanism with innovation investment and talent gathering as the chain mediation. The evaluation index system of high-quality economic development and the multi-step, multi-mediation model are constructed. The chain mediating effect is empirically tested by the bootstrap method and generalized least square method. The conclusions are as follows:

(1) By measuring the high-quality economic development level of 30 provinces (cities and autonomous regions) in the Chinese mainland (not including Tibet) from 2007 to 2017, it can be seen that the high-quality economic development level of the central and western provinces of China has been in a backward position compared with the eastern provinces.
(2) There is a significant negative correlation between resource dependence and the high-quality economic development, which indicates that there is a "resource curse" in the stage of high-quality economic development in China.

(3) By constructing a multi-step, multi-mediation model, this paper examines the chain mediating role of innovation investment and talent gathering between resource dependence and high-quality economic development. The results show that resource dependence has crowding-out effect on innovation investment and talent, and innovation investment can attract talent gathering. Furthermore, innovation investment and talent gathering can significantly promote high-quality economic development. Therefore, there is a chain mediating effect of "resource—dependence—innovation—investment—talent gathering—high-quality economic development".

The conclusions provide strong evidence from the Chinese mainland (not including Tibet) for testing the resource curse and its transmission mechanism in the stage of high-quality economic development, and also provide theoretical reference for further exploring the relationship between resource dependence and high-quality economic development in other countries and regions. The methods of this paper are universal, and researchers can learn from the methods and indicators used in this study to further explore the relevant research in other countries or regions.

Therefore, the main limitation of this paper is not considering the data of Tibet, Taiwan provinces or foreign countries. In the next step, researchers can build an index system of high-quality economic development in line with the reality of other countries or regions based on this paper, and test whether there is a resource curse, so as to provide more powerful evidence for better transformation and upgrading of resource-based regions.

5.2. Policy Recommendations

Therefore, the policy recommendations are as follows:

First, adjust the industrial structure and reduce the dependence on resource-based industries. Abundant natural resources per se will not have a negative impact on high-quality economic development, but due to the excessive dependence on natural resources in resource-based areas, economic growth is blocked, resources are exhausted, and the environment is deteriorating. In order to break this curse, we should promote the adjustment of industrial structure, reasonably control the proportion of resource-based industries, reduce the investment in fixed assets of mining sectors, raise the entry threshold of resource-based industries, and set a quota for mining.

Second, increased investment in innovation and improve regional innovation capability. Compared with the scientific and technological powers in the world, China's resources development and utilization technology research foundation is weak, the driving force for innovation is insufficient, and innovation environment needs to be further improved. Resource-based areas should increase innovation investment through government financial allocation, social capital, enterprise financing and other channels, and use innovation investment to purchase advanced equipment and introduce talents, so as to endow innovation ability and accumulate material capital and human capital to promote technological innovation, solve energy technology innovation problems and improve resource utilization; moreover, the increase of innovation investment is helpful to attract manufacturing enterprises with "learning by doing" effect to enter resource-based areas, which constitutes a virtuous circle for further scientific and technological innovation and talent attraction.

Third, build a new highland for talent gathering and attract talents to return. There are many factors affecting talents gathering, among which environment is the key and service is the guarantee. The environment includes innovation environment, employment environment, living environment, ecological environment, etc. Resource-based areas should form a development environment conducive to scientific and technological innovation by building innovative infrastructure and various incubation platforms; increase the diversity and openness of urban public real estate and other development spaces that give cities more innovative vitality; improve the ecological environment, realize the harmonious coexistence between man and nature, and improve the livability level of resource-based regions, so as to attract talents and promote the high-quality economic development.

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References

1. Sun, H.P.; Sun, W.F.; Geng, Y.; Kong, Y.S. Natural resource dependence, public education investment and human capital accumulation. *Pet. Sci.* **2018**, *15*, 657–665. [CrossRef]
2. Yang, Q.Y.; Song, D.Y. How does environmental regulation break the resource curse: Theoretical and empirical study on China? *Resour. Policy* **2019**, *64*, 101480. [CrossRef]
3. Qiu, Q.; Chen, J. Natural resource endowment, institutional quality and China's regional economic growth. *Resour. Policy* **2020**, *66*, 101644. [CrossRef]
4. Li, X.; Du, J.; Long, H. A comparative study of Chinese and foreign green development from the perspective of mapping knowledge domains. *Sustainability* **2018**, *10*, 4357. [CrossRef]
5. Li, X.; Du, J.; Long, H. Theoretical framework and formation mechanism of the green development system model in China. *Environ. Dev.* **2019**, *32*, 100465. [CrossRef]
6. Li, X.; Du, J.; Long, H. Dynamic analysis of international green behavior from the perspective of the mapping knowledge domain. *Environ. Sci. Pollut. Res.* **2019**, *26*, 6087–6098. [CrossRef]
7. Ma, R.; Luo, H.; Wang, H.W.; Wang, T.C. Study of evaluating high-quality economic development in Chinese regions. *Chin. Soft Sci.* **2019**, *7*, 60–67. (In Chinese)
8. Liu, H.; Long, H.; Li, X. Identification of critical factors in construction and demolition waste recycling by the grey-DEMATEL approach: A Chinese perspective. *Environ. Sci. Pollut. Res.* **2020**, *27*, 8507–8525. [CrossRef]
9. Long, H.; Liu, H.; Li, X.; Chen, L. An evolutionary game theory study for construction and demolition waste recycling considering green development performance under the Chinese government's reward-penalty mechanism. *Int. J. Environ. Res. Public Health* **2020**, *17*, 6303. [CrossRef]
10. Oskenbayev, Y.; Yilmaz, M.; Abdulla, K. Resource concentration, institutional quality and the natural resource curse. *Econ. Syst.* **2013**, *37*, 254–270. [CrossRef]
11. Harvie, C. The Dutch disease and economic diversification: Should the approach by developing countries be different? In *Trade Logistics in Landlocked and Resource Cursed Asian Countries*; Jayanthakumaran, K., Shukla, N., Harvie, C., Erdenetsogt, O., Eds.; Palgrave Macmillan: Singapore, 2019; pp. 9–45. [CrossRef]
12. Li, X.; Long, H. Research focus, frontier and knowledge base of green technology in China: Metrological research based on mapping knowledge domains. *Pol. J. Environ. Stud.* **2020**, *29*, 3003–3011. [CrossRef]
13. Auty, R. *Sustaining Development in Mineral. Economics: The Resource Curse Thesis*; Routledge: London, UK, 1993.
14. Brückner, M. Natural resource dependence, non-tradables, and economic growth. *J. Comp. Econ.* **2010**, *38*, 461C471. [CrossRef]
15. Sadik-Zada, E.R. *Oil Abundance and Economic Growth*; Logos Verlag: Berlin, Germany, 2016.
16. Wang, R.; Zameer, H.; Feng, Y.; Jiao, Z.L.; Xu, L.; Gedikli, A. Revisiting Chinese resource curse hypothesis based on spatial spillover effect: A fresh evidence. *Resour. Policy* **2019**, *64*, 101521. [CrossRef]
17. Xie, R.W.; Zhai, X.Y. Is financial development hampering or improving the resource curse? New evidence from China. *Resour. Policy* **2020**, *67*, 101676. [CrossRef]
18. Sadik-Zada, E.R.; Loewenstein, W. A note on revenue distribution patterns and rent seeking incentive. *Int. J. Energy Econ. Policy* **2018**, *8*, 196–204.
19. Arin, K.P.; Braunfels, E. The resource curse revisited: A Bayesian model averaging approach. *Energy Econ.* **2018**, *70*, 170–178. [CrossRef]
20. Hilmawan, R.; Clark, J. An investigation of the resource curse in Indonesia. *Resour. Policy* **2019**, *64*, 101483. [CrossRef]

21. Sadik-Zada, E.R.; Loewenstein, W.; Hasanli, Y. Production linkages and dynamic fiscal employment effects of the extractive industries: Input-output and nonlinear ARDL analyses of Azerbaijan. *Miner. Econ.* **2019**, 1–16. [CrossRef]
22. Sadik-Zada, E.R. Addressing the growth and employment effects of the extractive industries: White and black box illustrations from Kazakhstan. *Post-Communist Econ.* **2020**, 1–33. [CrossRef]
23. Boschini, A.; Pettersson, J.; Roine, J. The resource curse and its potential reversal. *World Dev.* **2013**, *43*, 19–41. [CrossRef]
24. Kurtz, M.J.; Brooks, S.M. Conditioning the resources curse: Globalization, human capital and growth in oil-rich nations. *Comp. Political Stud.* **2011**, *44*, 747–770. [CrossRef]
25. Sim, P. Natural resources and economic growth: The conditional curse. *IJEPS* **2013**, *8*, 113–145. [CrossRef]
26. Sadik-Zada, E.R. Distributional bargaining and the speed of the structural change in the petroleum exporting labour-surplus economies. *Eur. J. Dev. Res.* **2019**, *31*, 51–98. [CrossRef]
27. Wang, Y.; Chen, X.Y. Natural resource endowment and ecological efficiency in China: Revisiting resource curse in the context of ecological efficiency. *Resour. Policy* **2020**, *66*, 101610. [CrossRef]
28. Ali, S.; Murshed, S.M.; Papyrakis, E. Happiness and the resource curse. *J. Happiness Stud.* **2020**, *21*, 437–464. [CrossRef]
29. Nademi, Y. The resource curse and income inequality in Iran. *Qual Quant.* **2018**, *52*, 1159–1172. [CrossRef]
30. Sadik-Zada, E.R.; Loewenstein, W.; Hasanli, Y. Commodity revenues, agricultural sector and the magnitude of deindustrialization: A novel multisector perspective. *Economies* **2019**, *7*, 113. [CrossRef]
31. Steinberg, D. Resource shocks and human capital stocks—Brain drain or brain gain? *J. Dev. Econ.* **2017**, *127*, 250–268. [CrossRef]
32. Qian, X.; Wang, D.; Wang, J.; Chen, S. Resource curse, environmental regulation and transformation of coal-mining cities in China. *Resour. Policy* **2019**, 101447. [CrossRef]
33. Matsuyama, K. Agricultural productivity, comparative advantage, and economic growth. *J. Econ. Theory* **1992**, *58*, 317–334. [CrossRef]
34. Sadik-Zada, E.R.; Gatto, A. The puzzle of greenhouse gas footprints of oil abundance. *Socio-Econ. Plan. Sci.* **2020**. [CrossRef]
35. Kufenko, V. *Economic Growth and Inequality*; Springer Gabler: Wiesbaden, Germany, 2015. [CrossRef]
36. Kim, D.H.; Lin, S.C. Human capital and natural resource dependence. *Struct. Chang. Econ. Dyn.* **2017**, *40*, 92–102. [CrossRef]
37. Schumpeter, J.A. *Capitalism, Socialism and Democracy*; Harper & Bros: New York, NY, USA, 1942.
38. Romer, P.M. Endogenous technological change. *J. Polit. Econ.* **1990**, *98*, 71–102. Available online: http://www.jstor.org/stable/2937632. (accessed on 20 July 2020). [CrossRef]
39. Song, X.; Zhou, Y.; Jia, W. How do economic openness and R&D investment affect green economic growth?—Evidence from China. *Resour. Conserv. Recycl.* **2019**, *146*, 405–415. [CrossRef]
40. Zhou, B.; Zeng, X.Y.; Jiang, L.; Xue, B. High-quality economic growth under the influence of technological innovation preference in China: A numerical simulation from the government financial perspective. *Struct. Chang. Econ. Dyn.* **2020**, *54*, 163–172. [CrossRef]
41. Romer, P.M. Increasing returns and long-run growth. *J. Political Econ.* **1986**, *94*, 1002–1037. [CrossRef]
42. Barro, R.J. Economic growth in a cross section of countries. *Q. J. Econ.* **1991**, *106*, 407–443. [CrossRef]
43. Simon, C.J. Human capital and metropolitan employment growth. *J. Urban Econ.* **1998**, *43*, 223–243. [CrossRef]
44. Li, X.; Du, J.; Long, H. Green development behavior and performance of industrial enterprises based on grounded theory study: Evidence from China. *Sustainability* **2019**, *11*, 4133. [CrossRef]
45. Li, X.; Du, J.; Long, H. Understanding the green development behavior and performance of industrial enterprises (GDBP-IE): Scale development and validation. *Int. J. Environ. Res. Public Health* **2020**, *17*, 1716. [CrossRef]
46. Zallé, O. Natural resources and economic growth in Africa: The role of institutional quality and human capital. *Resour. Policy* **2019**, *62*, 616–624. [CrossRef]
47. Sun, H.P.; Sun, W.F.; Geng, Y.; Yang, X.; Edziah, B.K. How does natural resource dependence affect public education spending? *Environ. Sci. Pollut. Res.* **2019**, *26*, 3666–3674. [CrossRef] [PubMed]

48. Maslow, A.H. A theory of human motivation. *Psychol. Rev.* **1943**, *50*, 370–396. [CrossRef]
49. Zhang, S.D.; Hu, L.N.; Zhou, L.Q. Research on the measurement and influence of talent gather in the center cities of metropolitan area. *Sci. Technol. Prog. Policy* **2019**, *36*, 54–61. (In Chinese)
50. Shao, S.; Yang, L.L. Natural resource dependence, human capital accumulation, and economic growth: A combined explanation for the resource curse and the resource blessing. *Energy Policy* **2014**, *74*, 632–642. [CrossRef]
51. Wang, H.; Wang, S.; Yang, C.F.; Jiang, S.N.; Li, Y.J. Resource price fluctuations, resource dependence and sustainable growth. *Sustainability* **2019**, *11*, 6371. [CrossRef]
52. Sadik-Zada, E.R.; Ferrari, M. Environmental policy stringency, technical progress and pollution haven hypothesis. *Sustainability* **2020**, *12*, 3880. [CrossRef]
53. Sun, Z.Y.; Li, Y.L.; Wang, M.; Wang, X.P.; Pan, Y.W.; Dong, F. How does vertical integration promote innovation corporate social responsibility (ICSR) in the coal industry? A multiple-step multiple mediator model. *PLoS ONE* **2019**, *14*, e0217250. [CrossRef]
54. Hayes, A.F. Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Commun. Monogr.* **2009**, *76*, 408–420. [CrossRef]
55. Cheung, M.W.L. Comparison of approaches to constructing confidence intervals for mediating effects using structural equation models. *Struct. Equ. Modeling* **2007**, *14*, 227–246. [CrossRef]
56. Lau, R.S.; Cheung, G.W. Estimating and comparing specific mediation effects in complex latent variable models. *Organ. Res. Methods* **2012**, *15*, 3–16. [CrossRef]
57. Jahanger, A. Influence of FDI characteristics on high-quality development of China's economy. *Environ. Sci. Pollut. Res.* **2020**. [CrossRef] [PubMed]
58. Gu, W.; Wang, J.; Hua, X.; Liu, Z.D. Entrepreneurship and high-quality economic development: Based on the triple bottom line of sustainable development. *Int. Entrep. Manag. J.* **2020**. [CrossRef]
59. Chen, Y.; Zhu, M.K.; Lu, J.L.; Zhou, Q.; Ma, W.B. Evaluation of ecological city and analysis of obstacle factors under the background of high-quality development: Taking cities in the Yellow River Basin as examples. *Ecol. Indic.* **2020**, *118*, 106771. [CrossRef]
60. Xu, Z.; Yao, H.; Geng, P.; Li, D. Evaluation report on the economic growth quality of Western China. In *Redevelopment of Western China*; Yao, H., Xu, Z., Eds.; Springer: Singapore, 2017; pp. 161–192. [CrossRef]
61. Xu, K.; Wang, J. An empirical study of a linkage between natural resource abundance and economic development. *Econ. Res. J.* **2006**, *1*, 78–89. (In Chinese)
62. Huang, Y.; Fang, Y.G.; Zhang, Y.; Liu, J.S. A study of resource curse effect of Chinese provinces based on Human Developing Index. *Chin. Geogr. Sci.* **2014**, *24*, 732–739. [CrossRef]
63. Xue, Y.W.; Ye, X.T.; Zhang, W.; Zhang, J.; Liu, Y.; Wu, C.B.; Li, Q. Reverification of the "resource curse" hypothesis based on industrial agglomeration: Evidence from China. *J. Clean. Prod.* **2020**, 124075. [CrossRef]
64. Lashitew, A.A.; Werker, E. Do natural resources help or hinder development? Resource abundance, dependence, and the role of institutions. *Resour. Energy Econ.* **2020**, *61*, 101183. [CrossRef]
65. Yang, Z.B.; Shao, S.; Li, C.Y.; Yang, L.L. Alleviating the misallocation of R&D inputs in China's manufacturing sector: From the perspectives of factor-biased technological innovation and substitution elasticity. *Technol. Forecast. Soc. Chang.* **2020**, *151*, 119878. [CrossRef]
66. Florida, R.; Mellander, C. Technology, talent and economic segregation in cities. *Appl. Geogr.* **2020**, *116*, 102167. [CrossRef]
67. Cao, W.L.; Yao, J.J.; Yu, L.L.; Liu, Z.Y. The research on the relationship between talent agglomeration and industrial agglomeration in China. *Sci. Res. Manag.* **2015**, *36*, 172–179. (In Chinese)
68. Xiong, S.Y.; Wang, X.Y. Overcapacity, technological innovation and high-quality development of China's economy. *Stat. Decis.* **2020**, *36*, 86–90. (In Chinese)
69. Namazi, M.; Mohammadi, E. Natural resource dependence and economic growth: A TOPSIS/DEA analysis of innovation efficiency. *Resour. Policy* **2018**, *59*, 544–552. [CrossRef]
70. Parlee, B.L. Avoiding the resource curse: Indigenous communities and Canada's oil sands. *World Dev.* **2015**, *74*, 425–436. [CrossRef]

71. Wu, S.M.; Li, L.; Li, S.T. Natural resource abundance, natural resource-oriented industry dependence, and economic growth: Evidence from the provincial level in China. *Resour. Conserv. Recycl.* **2018**, *139*, 163–171. [CrossRef]
72. Cheng, Z.H.; Li, L.S.; Liu, J. Natural resource abundance, resource industry dependence and economic green growth in China. *Resour. Policy* **2020**, *68*, 101734. [CrossRef]