

Analysis of the impact of epidemic situation on economic production loss

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Abstract: Under the background of increasing economic development pressure in China, this paper evaluates the impact of COVID-19 in 2020 from the perspective of economic losses. Entropy method model was used to evaluate the impact of the current epidemic on all walks of life in China through entropy weighting method for selected indicators. Among them, residents' consumption capacity, industrial capacity, general trade import and export capacity, and fixed asset investment capacity have a certain negative impact. With the gradual increase of the outbreak time, the data reflected from January 2019 to December 2020 are studied and analyzed.

1. Proposal of research questions

Since the outbreak of COVID-19 at the beginning of 2019, it has brought an unprecedented blow to China's economy and the world's economy. the epidemic has brought inevitable losses to China's economic production. According to data from the National Bureau of Statistics, China's gross domestic product (GDP) fell 6.8% in the first quarter of 2020, which shows that China's industry has been severely affected by the epidemic. Although the epidemic has been effectively controlled in China, most of the factories and enterprises gradually returned to normal mode of operation, but outbreaks leading to social pressure is too large, the lack of demand. Secondly, the outbreak of foreign epidemics has caused superimposed harm to China's local epidemics and the supply and demand side, increased the loss of China's economic production and development, and slowed down the process of economic recovery. The policy of "city closure" in foreign countries also leads to the loss of China's foreign import and export trade economy. The global logistics supply chain also increases the pressure of China's contraction of external demand and insufficient domestic demand. Under the change of internal and external pattern, China is facing more serious loss of economic development.

2. The impact of the epidemic on China's economic production

In the past two years, most of the literatures on the epidemic have studied the pathogenic mechanism of the epidemic from the medical perspective, or the government's response measures and governance capacity from the perspective of public relations. In this paper, the research on the economic production of the COVID-19 mainly focused on the quantitative analysis.

2.1 Impact of the epidemic on residents' consumption capacity.

Epidemic outbreak since wuhan city, hubei province in China and gradually spread, the production of large area in major economies to cease, and the market demand significantly increased, gradually increased demand side, supply side is falling, "city" policy that railway, airlines cancelled large area, all the business end of the event, masks, totally out of stock, drugs, medical equipment throughout the country to aid to wuhan, causing local shortage of goods, there are many traders bidding up the price behavior, have led to a decrease in the level of residents' consumption in China and to increase the retail price.

2.2 Impact of the epidemic on industrial production capacity

The emergence of the epidemic, let each medium enterprises face a debt crisis and the risk of bankruptcy, although most regions of the country in various forms to resume production, but if outbreak continued, continue to shutdown will face the risk of bankruptcy, the lockout resulting in a decrease of the per capital income in our country, also is our country development process is slow. The rolling wheel of industrial production will not stop for the sake of humanitarian concern, and bankruptcy is irreversible. In addition, due to the limited time to resume work, the actual number of rework of employees is difficult to estimate, and the epidemic prevention standards and material conditions after the resumption of production are also faced with problems. The transportation and logistics channels will also be blocked, which will lead to the temporary loss of export orders, increase production difficulties and make the pressure of capital chain worse.

3. Analysis of the impact of the epidemic on economic production loss

First of all, it is inevitable that the epidemic will have an impact on China's economy, and it will be comprehensive. But it only belongs to the negative impact of a sudden event, not a systemic economic imbalance, currently COVID - 19 outbreak in the country has been basically under control, the epidemic prevention and control effect of each city deepens, design a set of applicable to describe below economic development capacity index system, using the entropy method in 2019-2020 shipped the indicators to evaluate the relationship between contrast each other, and analyze its influential factors and regional differences.

3.1 Research objects and data sources

Table 1 below shows the urban agglomerations to which the index cities belong

Table 1: Distribution table of selected cities and their subordinate regions

| Urban agglomeration | Contains city | Urban agglomeration | Contains city | Urban agglomeration | Contains city |
|---------------------|-----------------------|---------------------|-----------------------------|---------------------|---------------------|
| In the northeast | Heilongjiang province | East China area | Shandong Province, Shanghai | In south China | Guangdong province, |
| In the southwest | Sichuan province | In central China | Hubei province | | |

The index selected by the entropy method and the weight of each index calculated by the entropy weighting method are shown in Table 2 below. The first three indexes are general trade import amount (US dollars), general trade export amount (US dollars) and commodity retail price index, and the last two indexes are the purchasing price of industrial producers and the year-on-year growth of industrial added value. Show that in 2019-2020, the city's economic production loss is bigger, relatively slow

economic development trend, the overall, outbreaks can have short-term negative impact to the economy, Labour intensive and predominantly offline consumption industry, will face the larger impact, but the disease indirectly promote the development of the Internet economy, increase the ability of China's import trade, accelerate the process of the traditional industry of the Internet.

Table 2: Calculation results of China's economic production loss index by entropy method

| Level indicators | The secondary indicators | The weight | Weighted ranking |
|---|---|------------|------------------|
| Household Consumption Capacity (A1) | Consumer Price Index (B1) | 0.1392 | 4 |
| | Retail Price Index (B2) | 0.1694 | 3 |
| Industrial Capacity (A2) | Year-on-year growth index of industrial added value (B3) | 0.03047 | 7 |
| | Producers' Purchasing Price Index (B4) | 0.04696 | 6 |
| General trade import and export capacity (A3) | General Trade Exports (US \$) (B5) | 0.2026 | 2 |
| | General Trade Imports (US \$) (B6) | 0.3638 | 1 |
| Capacity of investment in fixed assets (A4) | Completion of investment in fixed assets _ cumulative growth (%) (B7) | 0.0476 | 5 |

3.2 Data analysis

Due to the length of the paper, only part of the data are placed, The scores of economic production loss and first-level indicators in 2019-2020 calculated by entropy method are shown in Table 3. According to the entropy method, the overall level of economic production loss in 2019-2020 shows an increasing trend year by year.

Table 3: The score table of China's economic production loss level in 2019-2020

| time | Economic production loss index score | B1 | B2 | B3 | B4 | B5 | B6 | B7 |
|---------|--------------------------------------|--------|--------|--------|--------|--------|--------|--------|
| 2020.12 | 0.4379 | 0.0248 | 0.0280 | 0.0255 | 0.1238 | 0.1737 | 0.0426 | 0.4379 |
| 2020.11 | 0.3948 | 0.0278 | 0.0221 | 0.1201 | 0.1688 | 0.0422 | 0.3948 | 0.0194 |
| 2020.06 | 0.4801 | 0.0646 | 0.0589 | 0.0251 | 0.0173 | 0.1138 | 0.1623 | 0.0380 |
| 2020.05 | 0.4653 | 0.0664 | 0.0575 | 0.0246 | 0.0142 | 0.1150 | 0.1513 | 0.0362 |
| 2020.04 | 0.5096 | 0.0835 | 0.0759 | 0.0248 | 0.0179 | 0.1115 | 0.1619 | 0.0341 |
| 2020.03 | 0.5447 | 0.1029 | 0.0987 | 0.0184 | 0.0263 | 0.1045 | 0.1630 | 0.0310 |
| 2020.02 | 0.6695 | 0.1145 | 0.1252 | 0.0191 | 0.0305 | 0.1232 | 0.2286 | 0.0284 |
| 2020.01 | 0.6713 | 0.1177 | 0.1221 | 0.0189 | 0.0322 | 0.1232 | 0.2286 | 0.0285 |
| 2019.01 | 0.4941 | 0.0487 | 0.0534 | 0.0261 | 0.0302 | 0.1118 | 0.1789 | 0.0449 |

The six cities selected in this paper are divided into regions as shown in Table 1. The score of economic production loss of cities in different regions by entropy value method is shown in Table 4. It can be seen that the economic production losses affected by the epidemic are gradually slowing down, and the coastal areas such as South China and East China have recovered rapidly, and the economic production recovery level of the areas along the river such as Central China has been consistent, while the inland areas such as Northeast and Southwest China are greatly affected by the economic production losses and have low economic development scores.

Table 4: Entropy score table of economic production loss levels in different regions

| time | The northeast | East China | Central China | southwest | South China |
|---------|---------------|------------|---------------|-----------|-------------|
| 2020.12 | 0.2319 | 0.5867 | 0.3126 | 0.2427 | 0.6666 |
| 2020.11 | 0.1748 | 0.5485 | 0.2666 | 0.2023 | 0.6280 |
| 2020.06 | 0.2242 | 0.6173 | 0.3568 | 0.3750 | 0.6898 |
| 2020.05 | 0.2114 | 0.6014 | 0.3501 | 0.3387 | 0.6884 |
| 2020.04 | 0.2713 | 0.6319 | 0.4040 | 0.3889 | 0.7299 |
| 2020.03 | 0.3498 | 0.6546 | 0.4166 | 0.4384 | 0.7545 |
| 2020.02 | 0.5019 | 0.7742 | 0.5308 | 0.5566 | 0.8793 |
| 2020.01 | 0.5278 | 0.7968 | 0.4907 | 0.5191 | 0.8963 |
| 2019.01 | 0.2931 | 0.6072 | 0.3517 | 0.3242 | 0.7810 |

4. Conclusions and measures

4.1 Conclusion of entropy method

The results of the entropy method show that the economic production loss of China under the influence of the epidemic has been decreasing in 2019-2020 with the effective control of the epidemic in China. The regional economic development shows the characteristics of South China >, East China >, Central China >, Southwest China > and Northeast China.

4.2 Measures for economic production under the epidemic situation

From the perspective of macroeconomics, in order to restore the economy to the normal stage of stable development, we should control the epidemic situation as soon as possible from all angles, so as to restore the economic development of various regions. In response to the outbreak of the new coronavirus pneumonia, the negative effect on the economy, the need to adjust, gathered from the staff, the disease are more likely to happen in the key areas to take the transportation of the railway, the various tourist attractions close blockade, large entertainment venues, cancelled all kinds of collective activities, although so far these are very negative impact on the economy, but the long pain rather short pain, if in order not to let the trend of economic decline and ignore for epidemic prevention and control work, the new coronavirus pneumonia in a reciprocating state for a long time, is bound to cause a greater impact in the future.

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