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A New "Consumption-production" Market Model

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ABSTRACT

Based on the long tail model, this paper assumes a new form of mutual change between producers and consumers and obtains a consumption and production economic model adapted to the modern market economy, and carries out practical verification of the model. The conclusion is that the main body of the future market economy will change from producers to consumers.

1. Theoretical Model

In October 2004, Chris Anderson, editor in chief of wired magazine, first proposed the Long Tail theory in his article, telling readers that the future of business and culture lies not in the hot products and the head of the traditional demand curve, but in the endless Tail of the demand curve. Since the advent of the "long tail theory" in 2004, it has crossed the boundaries of the new economy and entered the traditional economy: more and more industries have noticed that the long tail market is not the exclusive privilege of the new economy, but the ubiquitous reality of all traditional industries [1].

As shown in Figure 1, the left side of point Q can be the head region of the long-tail model, while the right side of point Q belongs to the long-tail region. In the modern market economy, for the producers, the head area representative of this part has a lot of manufacturers, so this part of the production of products and services is huge, and if there is not enough demand, so this part of the competition between manufacturers is huge, so the head area in the commercial market has become "the red sea market". The corresponding long tail area on the right is called the "blue Ocean Market". Blue ocean market refers to a market in which there are fewer producers and there-

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fore fewer goods and services, and therefore more competition among producers. In the future, the long tail will be the main area of market competition and innovation.

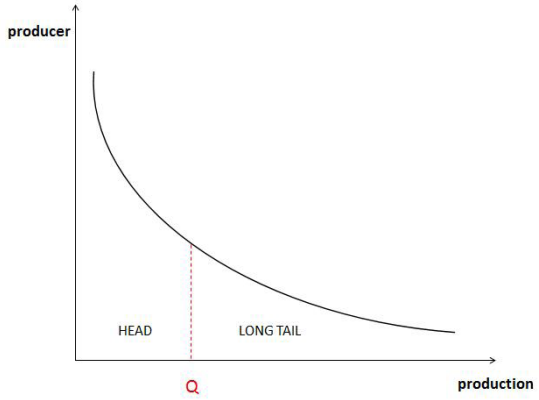

Figure 1. Long tail model

According to classical economic theory, we know that the quantity or quantity demanded by both producers and consumers is influenced by one key factor: price. In the past, producers dominated the market, so the decision on price, output and product characteristics depended on producers, who played an absolute role in the market economy. Consumers are often in a weak position in the whole society and can only passively accept the information, price, characteristics and quality of goods and services provided by producers [2].

However, since entering the information age, the information, prices and characteristics of goods and services are no longer the exclusive monopoly of producers [3]. At present, the world's overproduction, with the continuous upgrading of the entire consumer market, the future market competition will further return to consumer factors.

2. Theoretical Hypothesis

For consumers, classical economic theories usually focus on the price of goods, which determines the purchase quantity of consumers. The lower the price, the higher the quantity demanded. The higher the price, the lower the quantity demanded [4]. Therefore, when consumption is constantly upgrading into new consumer markets, the competition between enterprises in the future will focus on the long tail region according to the long tail model. In the long tail region, there will not be many producers, so the output will not be very large [5]. Therefore, in this field, we can assume that the factors affecting consumers in the new era include personalized customization, multi-scene consumption presentation, green service and other new consumption experience. We can collectively refer to these factors as U for the utility of consumers, and P for the price of goods and services. So the correspondence is P=F(U).

3. Hypothesis Model

3.1 Consumer "Price-utility" Model

Based on the observation of the modern consumer market, the relationship between utility and price for consumers is assumed as shown in Figure 2. Assuming A commodity has an initial price for P0 located at point A,that is, the cost price of goods or the lowest price, so with the increase of utility U, P there will be A corresponding increase prices, but U won't affect consumer prices P, infinite utility when it will be located in A utility maximization U_{max} located at point C, but not at this time of utility maximization, That's when the price of this good is at its peak, P_{max}, and after that the price is going to go down, down until P1 is at D on the curve, and after that no matter what utility U does, the limit of utility is going to stabilize at P1, U_{lim} is P1. When the price is at P1, due to the interaction between the producer's production demand and the consumer's consumption demand, sometimes the price of the good will be infinitely close to the cost price of the good P0.

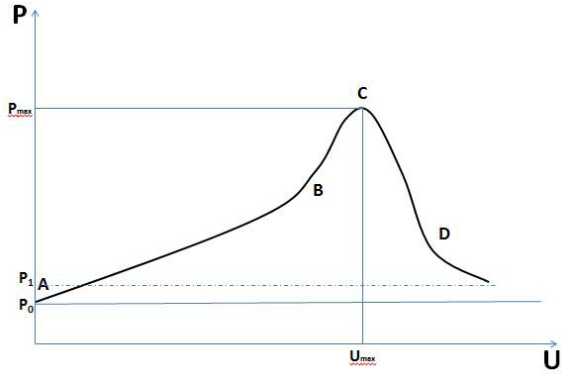

Figure 2. Price-utility model

Curve change rule of consumer P to U

(1) When the curve is located in the AB segment, $dP/dU>0$ and $dP^2/d^2U>0$. At this stage, the more utility U, the higher the price P, because consumers are not familiar with the product at the beginning, the increase in utility for consumers is greater than the increase in the price of the product that consumers are willing to buy. That is to say, at this stage, the increase in utility to consumers does not increase the price of the goods that consumers are willing to buy. As the overall change rate of consumer price to utility gradually accelerates.

(2) When the curve is located in the BC segment, $dP/dU>0$ and $dP^2/d^2U<0$. At this stage, although the effect of utility on price is still positively correlated, the rate of change of utility and price begins to slow down. At this

stage, the increase of utility for consumers is less than that of the price of the product, which means that there is no need to increase utility too much. Consumers are also willing to pay higher prices to consume the goods. In the AC segment of the curve, although the overall correlation is positive, and the price increases as the utility increases, the dP/dU of line BC is larger than the dP/dU of line AB, that is, in the AB segment, utility is more important, and in the BC segment, utility is less important.

(3) CD section of the curve, because point C is U_{max} and P_{max}, that is, the price at this moment is the highest price of the product. After that, no matter how the utility acts, the price will not increase again, and then the price starts to decline. When the curve is in the CD segment, $dP/dU<0$ and $dP^2/d^2U>0$, the relationship between utility U and price P is negatively correlated in this period. On the other hand, the price will decrease faster and faster in this period.

(4) When the utility continues to work, the final price of the product will stabilize at P1, $\lim U\to\infty f(U)= P1$.

3.2 Producer "Capital-utility" Model

For producers, in order to ensure smooth production, the key factor of production comes from capital. For capital denoted as K, the relationship between capital and utility can be denoted as K=F(U). In order to satisfy consumers' utility, according to consumers' "price-consumption", we can assume the "capital-utility" model shown in Figure 3.

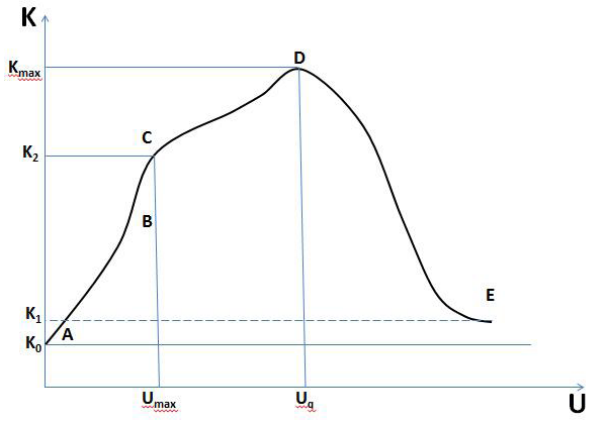

Figure 3. Capital-utility model

If the producer makes capital investment in order to produce A commodity, there will be an initial capital input for production, denoted as K0 at point A. After the commodity is produced, in order to satisfy consumers, the producer will invest capital to improve the utility of consumers. So as you invest more and more of your capital, you're getting more and more utility to the consumer and you're going to get a maximum utility U_{max} at point C on the curve. According to the consumption model, this is also the highest price paid by consumers, P_{max}, and the amount of investment is K1. But for producers, it is not a reduction in investment, but a further increase in investment. Because producers will carry out price competition or brand technology upgrading and other measures for the market position or market share of the product, the price for consumers will be reduced and the investment of producers will be further increased. Until K_{max} is point D, when the investment scale reaches the maximum, producers will not make additional investment, and at the same time, producers begin to make profits, that is, the income is greater than the investment cost. After that, the amount of investment starts to decrease, and finally K3 is at point E of the curve, and the capital invested in K3 is infinitely close to the basic cost of investing in the good, K0.

Producer K versus U

(1) When the curve is located in the AC segment, the curve generally rises, that is, the change of K to U is positively correlated, the utility increases, and the amount of capital investment increases.

(2) When the curve is located in AB segment, $dK/dU>0$, $dK^2/d^2U>0$, the growth and change rate of capital and utility gradually accelerated. When the curve is BC segment, $dK/dU>0$, $dK2/d2U<0$, and the change rate of capital and utility growth slows down. In segment AB, the capital input of capital is greater than the increase in utility in order to make consumers experience more quickly. In segment BC, the change in utility is greater than the change in capital input.

(3) When it reaches point C, it has the maximum utility for consumers and the highest price. After that, it continues to make additional investment. The change of investment is greater than the change of utility and finally reaches point B with the maximum capital. In CD segment, $dK/dU>0$ and $dK^2/d^2U<0$, the change rate of investment increase and utility increase slows down, and dK^2/d^2U in CD segment is smaller than dK^2/d^2U in BC segment, that is, the change rate of investment and utility increase after the consumer's utility maximization is slower than before the change rate of utility maximization.

(4) After point D, in the DE segment, capital increment gradually decreases, but profits will increase. At this stage $dK/dU<0$, $dK^2/d^2U>0$, the reduction curve of investment and utility decreases gently, and finally approaches the point K3.

4. Model Conclusions

It can be seen from the two models of consumers and producers :

(1) both models show an increasing trend before reaching P_{max} and K_{max}, and then show a decreasing trend.

(2) For consumers, the maximum value of utility, U_{max}, is exactly the highest price P_{max} that consumers are willing to pay.

(3) For the producer, after the maximum capital input K_{max}, the producer can achieve the balance of income and expenditure, and then it is the profit stage.

(4) Generally speaking, for consumers and producers, both sides reach a win-win situation in the declining stage, because it is not only the stage where producers benefit, but also the continuous decrease of prices is beneficial to consumers.

(5) The maximum capital quantity of producer K_{max} is always a little more than the maximum price P_{max} of consumer's purchase demand, and producer K0 will be slightly lower than consumer P0, because any commodity will have basic capital input.

5. A New "Consumption-production" Market Model

From the perspective of the model of the relationship between producer and consumer, utility is the key factor to determine their benefits. Hypothesis: The variation relationship shown in Figure 4. We know that the overall change trend of both consumers and producers increases first and then decreases, so the change trend of consumers is curve LP1 and that of producers is curve LK1. The change in consumer LP1 goes from P0 to P_{max} and then down to P1, and the change in producer LK1 goes from K0 to K_{max} and then down to K1. If the maximum utility to the consumer is known, then U_{max0} will shift over to U_{max1}, P_{max0} will drop down to P_{max1} and K_{max0} will drop down to Kmax1. It means that the consumer of the good has to pay a lower maximum price, and the producer has to provide a lower maximum amount of capital to produce the good.

Therefore, if the maximum utility U_{max1} is lower than the expected maximum utility U_{max0}, the maximum price paid by consumers will be reduced, and the amount of capital for producers will be reduced, and the investment time to reach the maximum amount of capital will also be reduced, so the time for producers to enter the income will be correspondingly accelerated. Therefore, if the U_{max} is given by consumers, it is a win-win outcome for both consumers and consumers. The conception of the new market consumption model: the Consumer provides the best utility U to the Consumer, and the producer (Poducer) carries out capital input and production according to the given utility value. Namely, Consumer to Producer (C2M) consumption mode.

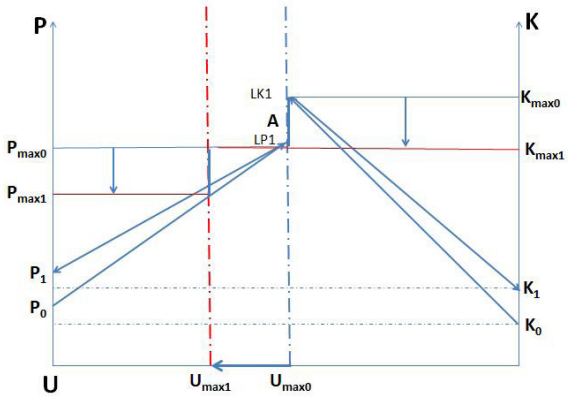

Figure 4. "Consumption-production" maximum utility change

References

[1] Salvador, F., Piller, F.T., Aggarwal, S., 2020. Surviving on the long tail: An empirical investigation of business model elements for mass customization. Long Range Planning. 53(4).

[2] Booth, G.D., 2017. A Long Tail in the Digital Age: Music Commerce and the Mobile Platform in India. Asian Music. 48(1), 85-113.

[3] Arawatari, R., Ono, T., 2015. A Political Economy Model of Earnings Mobility and Redistribution Policy. Journal of Public Economic Theory. 17(3), 346-382.

[4] Moumita, B., Narayan, N.R., 2018. Capital Accumulation, Asset Price Dynamics and the Macroeconomy: A Dependent Economy Model. Foreign Trade Review. 53(3), 127-155.

[5] Donald A.R.G., Lin, B.Ch., Chen, Y.M., 2015. A circular economy model of economic growth. Environmental Modelling & Software. 73, 60-63.

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Trading Strategies for All Stock Programs

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ABSTRACT

Market traders buy and sell volatile assets frequently, with a goal to maximize their total return. There is usually a commission for each purchase and sale. Two such assets are gold and bitcoin. In order to solve the existing issues of purchases between gold and bitcoin, given that we have 1,000 USD, what strategies should we take to maximize our profits? In this article, the authors established seven models to predict the value of gold and bitcoins and how you should buy them, as the trends of value fluctuate, our models must be accurate enough to avoid being influenced. Targeted at that, the content is divided into three parts. For part 1: The authors selected several indicators that feature how the stock runs. For instance, price of gold and profit of gold to build first two models, which are the risk of investment model and the judgment on bull-or-bear market model. Then we use these models to evaluate whether it is safe to invest. The models are as follows: bear-bull market judgment model, risk of investment evaluation model, prediction model, trade model. For part 2: Based on the data concerned, the authors established the time series model to predict the way the market fluctuates. Meanwhile, the result of this model can be applied in correcting the results of former two models so as to make it more accurate. For part 3: The authors combined models above to give the best trading strategy. In addition, we improved the models by adding more indicators to make it more precise. We hope that by applying our models and strategies, you can successfully maximize your profit.

1. Introduction

1.1 Background

In order to indicate the origin of the trading strategies problems, the following background is worth mentioning.

Since the price of bitcoin and gold varies as time passes by, it is hard to maximize the profit directly, especially when the fluctuation of value is beyond any pattern, making it essential for us to build relevant models to predict its trend and make the right choice.

1.2 Restatement on the Problem

Currently, our team has been commissioned by the ICM Institute to build a model to make trading strategies that maximize the profit of buyer, and the problems that we need to solve are:

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1) Establish a model that gives the best daily trading strategy according to the data due to present day. And give the final value of the investment of 1,000 USD.

2) Mention the proof that our model gives the best strategy.

3) Confirm the sensitivity of the strategy when trading cost varies.

2. Assumptions

To simplify the problem, we made the following basic assumptions, each of which is properly justified [1].

Assumption 1: Indicators of the fluctuations are ascending rate and expected ascending rate and they are the main indicators.

Assumption 2: The threshold value of relevant models which is the average value is reasonable.

3. Models

3.1 Symbols and Definitions

To make our models more apprehensive, we give each indicator corresponding weight symbol:

3.2 Prediction Model

3.2.1 Selection of Parameters

After reviewing the relevant articles [6] and considering the feasibility (quantification of the difficulty and integrity of the data), we decided to select gold BIAS, risk of purchase, etc. as assessment factors.

3.2.2 Data Process

Since the data given lacks gold price when trade is not available, to make the calculation easier, we defined the gold price of a non-trading day as that of former one trading day, and mark whether the current day is a gold trading day [2]. To test whether it is available for time series model, we have to examine the stability of the data by applying DM (different methods), and here is what we've got:

3.2.3 Foundation of Model

Since the price varies drastically, we processed the data by applying different equations. Moreover, we raised a presumption that the data are not stable enough to apply

Table 1. Indicators and symbols

Symbol	Indicator	Definition
B_b	BIAS (bitcoin)	Percentage of distance between bitcoin's closing price of the day and its 5-day moving average price
B_g	BIAS (gold)	Percentage of the distance between the closing price of gold on that day and the 15 day moving average price
w_g	Bear-bull market judgment value (gold)	Bitcoin bear bull market judgment value weighed by increase and deviation rate of gold
W_{gt}	Bear-bull market judgment threshold value (gold)	Threshold defined by bitcoin bear bull market judgment
W_b	Bear-bull market judgment value (bitcoin)	Bitcoin bear bull market judgment value weighed by bitcoin increase and deviation rate
W_{bt}	Bear-bull market judgment threshold value (bitcoin)	The threshold set for the judgment of gold bear and bull market
A_g	Amount increase of (gold)	The rise of gold price on that day compared with yesterday's price
A_b	Amount of Increase (bitcoin)	The rise of bitcoin price on that day compared with yesterday's price
A_{ge}	Expected amount of increase (gold)	The rise of the predicted price of gold on the next day in percentage
A_{be}	Expected amount of increase (bitcoin)	The rise of the predicted price of bitcoin the next day in percentage
R_g	Risk of gold investment score	Quantitative value of gold risk description
R_b	Risk of bitcoin investment score	Quantitative value of bitcoin risk description
B_{sg}	Buy score (gold)	The value of gold purchased
B_{sb}	Buy score (bitcoin)	The value of bitcoin purchased

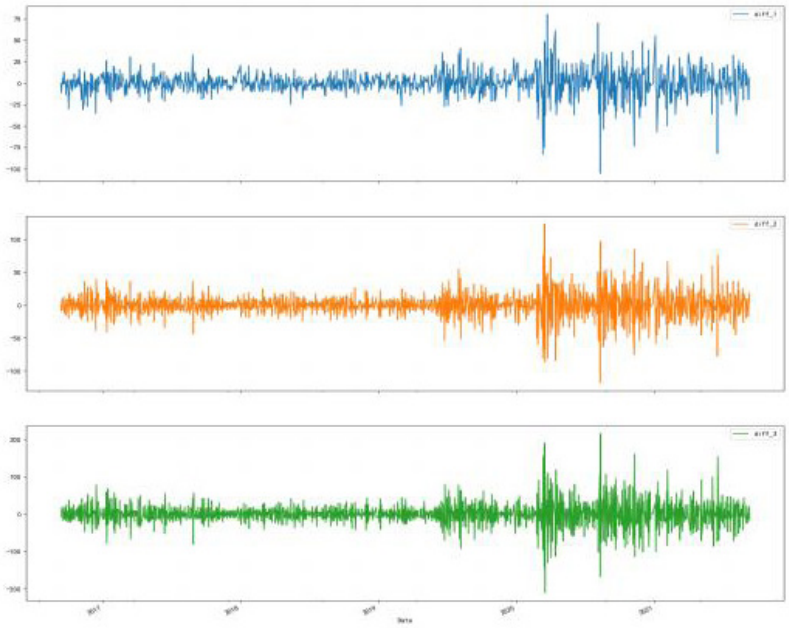

Figure 1. Different times different figure

time series model, thus reduction to absurdity is available. Meanwhile, we applied ADFuller test to examine the stability of the data, conclusion indicates that the presumption is rejected, making it possible for us to apply time series model to predict. What's more, ARIMA model is applied quite well when it comes to the prediction.

Here is the predicted gold amount of increase data visualized with python:

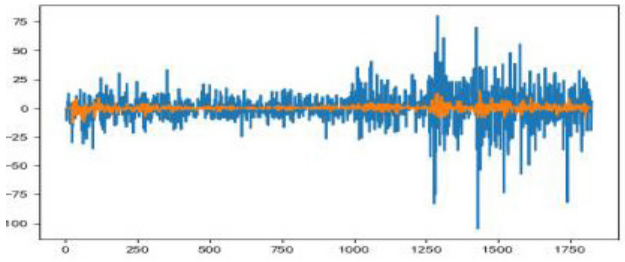

Figure 2. Gold amount of increase

And this is bitcoin amount of increase figure:

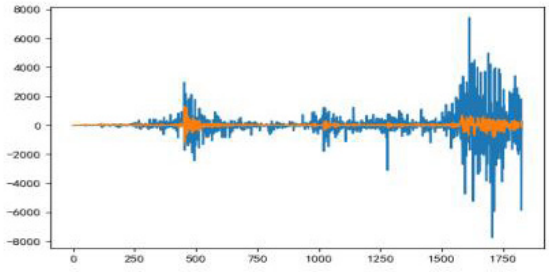

Figure 3. Bitcoin amount of increase

3.3 Bear-Bull Market Judgment Model

3.3.1 Data Process

After we converted the time to the date data type, we calculated the amount of increase of gold and bitcoins.

Then, for the better deployment of data when building bull-bear market, we use the equation below to normalize them:

$$Normalization = (Current\ Value - Min.) / (Maximum - Min.)$$

3.3.2 Model Building

Bull market refers to stock market in which price is on an upward trend during a long period. The trend of ascending of gold can be reflected by amount of increase in price, upward trend of average line within 15 days, expected amount of increase in price and so on, which means when the indicators above rose by certain ratio, we can regard the market as bull market. Therefore we're applying AHP to calculate the weight of four indicators in deciding whether it is bull or bear market, and multiply the value of indicator with corresponding weight, then add them all up to get a decisive value, which is $\boldsymbol{Wx}$, Next we will randomly get several value averaged to have threshold value, when the decisive value is above the threshold value, the market will be defined as bull market, opposite the otherwise. Bitcoin model-building method and gold model-building method are similar, but considering the

gold price is stable and that of bitcoin is the opposite. Therefore, bitcoin is more suitable for short-term trading, and gold is more suitable for long-term trading, so we take the 5-day moving average rise as the bitcoin bull market judgment index, and the 15-day moving average rise as the gold bull market judgment index.

First, we will establish gold bull-bear market judgment model [3].

To be specific, we selected the average 45-day BIAS, the average 45-day amount of increase as indicators and applied AHP to have their weight.

Then add them up to have the decisive value to determine whether it is bull market or bear market:

$$Decisive\ value=Bg45*0.379+Ag45*0.621$$

And that of bitcoin is established with same method, the only difference is that the evaluation of bitcoin market should be carried out per month.

To make the scores of evaluation more standard, we take the same method which is normalization to unitize them so as to make it more convenient for latter AHP calculation.

3.4 Risk of Investment Evaluation Model

The way we establish this model [4] is quite the same. What comes first is the selection of indicators. From our literature review, we got several indicators.

With the same type formula, we have its decisive value, to make it more apprehensive, we visualized them and found it quite reasonable.

3.5 Trade Model

Data Process

According to the results of former four models, we got several predicted value from ARIMA, for instance, the expected amount of increase. To make data more precise, we processed the residual difference which is mainly from non-trading days, to be specific, we applied the residual difference from last trading day to compensate this vacancy, then we normalized the expected amount of increase and residual error.

Model Building

Applying the data processed above, we established an assessment model, it gives a buy-score that composed of indicators with its weight multiplied [5]. Whether the score exceeds a certain threshold determines whether to buy or not, the amount of the score determines how much to buy so as to achieve the mathematical quantification of the problem. We combined the bear bull market judgment (Wx), investment risk (Rx), and the expected increase (Axe), residual difference calculated from the forecast model, By the way these indicators affect investment buying in economics, give them the corresponding weights [7]. Buy-scores were obtained based on the formula(df is the abbreviation of difference):

$$Df[\boldsymbol{Bsx}]=df_{gold\ residual\ difference}+[df\boldsymbol{Aex}(\text{normalized})]*9 +[df\ \boldsymbol{Wxt}\ ]*4+2/[df\boldsymbol{Rx}]$$

By the formula we have the distribution figure of the final buy-score, then we compare the distribution figure to the price expectation figure to demonstrate the reasonableness of the score, Because the price changes relatively much over a certain period of time, high score is thus lead to. We normalized the score, The final score distribution is obtained, we then set up a trading system, which is:

1) If the gold score is greater than 0.58, you are suggested to buy. If less than 0.3, you are suggested to sell. If the Bitcoin score is higher than 0.71, you are suggested to buy, if less than 0.56, you are suggested to sell. What's more, because trading both gold and bitcoin is bound to appear both are judged to buy, we established the judgment which indicates: if gold score - buy standard (0.58) > (bitcoin score - buy standard (0.71)) * 2 (because the gold score standard is smaller than Bitcoin, has a higher rise space), only buy gold, otherwise buy Bitcoin.

2) The purchase and sale amount shall be calculated by the formula: purchases = (Cash/gold price) *0.99*Bsx

3) We used the system editing code to calculate the total assets of each time, and map the total assets change.

To make it more comprehensible, we visualized some data, here is the gold buy-score, orange color points mean that you are suggested to sell and blue color the opposite:

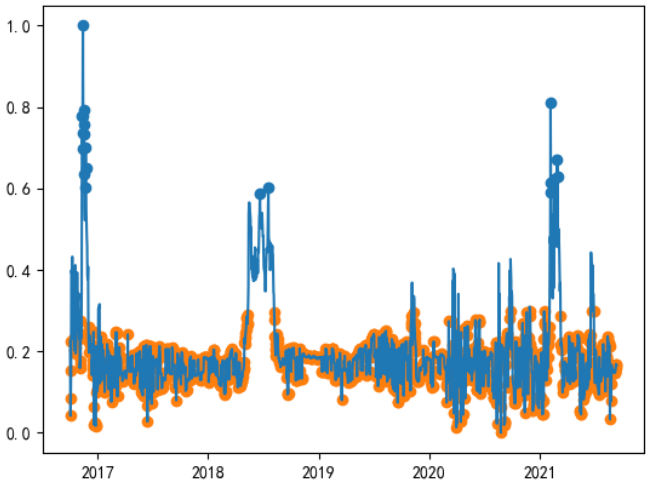

Figure 4. gold buy-score distribution

4. Sensitivity Analysis

In our model, the proportion of transaction volume is also a very important indicator. Here, it is specified as a fixed value, so it is incorporated into the model as a constant value. But we should also consider the impact of its changes on our model. Therefore, we take the gold commission from 0.01 to 0. 11, take a value every 0.01, and the bitcoin commission from 0.01 to 0.21, take a value every 0.01, then calculate the final transaction result, the following figure was thus generated.

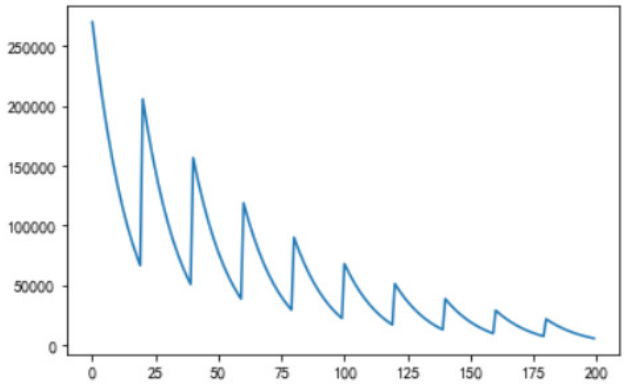

Figure 5. sensitivity analysis figure

This table can be divided into 10 intervals with a horizontal width of 20. Within the interval, it represents the curve of bitcoin Commission increasing from 0.01 to 0.21, while from the first interval to the tenth interval, it represents the increase of gold commission from 0.01 to 0. 11.

Here, we can see that bitcoin transactions are less sensitive to commissions and change little. The change rate of total assets is basically unchanged from 0.01 to 0.21. For every 0.01 Commission increase, the total assets will decrease by 3.84%. The sensitivity of gold is high, but it obviously decreases with the increase of commission. When the Commission increased from 0. 1 to 0.06, the total assets decreased by 73.5%, with an average decrease of 14.7% per 0.01, about five times that of bitcoin. When it increased from 0.06 to 0. 11, the total assets decreased by only 47.9%, and the sensitivity was 34.8% lower than that when it increased from 0.01 to 0.06. It is foreseeable that as the Commission continues to rise, the total assets will be more sensitive to commission, but still higher than bitcoin.

5. Improved Model

5.1 Foundation of Improved Model

We optimize the model of bull market and bear market. In our initial calculation model, we obtained such a bear bull market distribution map. (bitcoin on the left and gold on the right)

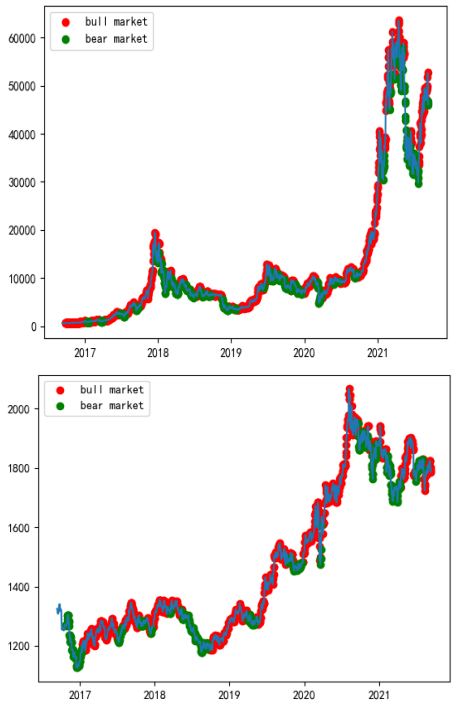

Figure 6. bitcoin&gold bear bull market distribution

However, we believe that such a model deviates from our common sense understanding of the bull and bear market. For example, the sharp decline of bitcoin after reaching its peak in early 2018 is an obvious bear market, but it is judged as a bull market at the inflection point, which will mislead our choice. In other words, its judgment is not sensitive enough.

Therefore, we used a voting method to determine the optimization model of bull and bear market. For example, according to the indicators, today is a bull market for gold, so it is a bull market a quarter ago. However, if it is calculated as a bear market yesterday and tomorrow is also calculated as a bear market, the error of today's calculation result may be large. In order to solve this error, the initial value at all times is 0. If it is currently calculated as a bull market, the value of the previous quarter will increase by 1, and if it is a bear market, it will decrease by 1. If the final result is greater than 0, it is a bull market and less than 0 is a bear market.

Under this optimization model, we get two optimized distribution maps of bear and bull market. Many inaccurate bull and bear market judgments have been corrected.

5.2 Evidence that Proved Our Best Strategy

The data that we use is definitely reasonable. Buy at a low price and sell at a high price, then we calculate the maximum yield rate under this method, then, with the model of our establishment, we calculate the maximum

yield under our strategy. Comparing the two maximum yields, the maximum yield generated by conducting exchanges with our strategy is greater, to prove that our strategy is the best strategy. We calculated the yields only by trading from the bear-bull market, that is, using a single technical means to get the yield. Compared with the yield obtained by our strategy, trade with our strategy yields greater profits, providing further evidence for our strategy being the optimal strategy.

6. Conclusions

6.1 Conclusions of the Problem

- Sensitivity of our final trade model is quite good.
- Our strategy works almost the most perfect.
- Our final property is \$220,000 (due to Sep 9^{th} 2021).

6.2 Methods Used in Our Models

- Voting method;
- Difference method;
- Normalization of data.

6.3 Applications of Our Models

- Prediction of the bitcoin and gold market;
- Offering suggestions of purchasing.

References

[1] Novak, I., 2019. Efficient market hypothesis: case of the croatian capital market. Journal for the International and European Law, Economics and Market Integration. 2-5.

[2] Boya, Ch., 2017. Testing capital market efficiency. Global Business and Economics Review. Tavel, P. 2007 Modeling and Simulation Design. AK Peters Ltd. 19(2).

[3] Wu, X., Chen, H.L., Wang, J.J., et al., 2020. Adaptive stock trading strategies with deep reinforcement learning methods. Information Sciences. 538.

[4] Tetiana, Z., Olesia, G., Maryna, B., et al., 2021. Methodological Tools for Investment Risk Assessment for the Companies of Real Economy Sector. Journal of Risk and Financial Management. 14(2), 3-7.

[5] Bouri, E., Das, M., Gupta, R., et al., 2018. Spillovers between Bitcoin and other assets during bear and bull markets. Applied Economics. 50(55), 3-6.

[6] Li, X.Y., Zakamulin, V., 2020. Stock volatility predictability in bull and bear markets. Quantitative Finance. 20(7), 2-4.

[7] Yue, Sh., Hu, Y.Ch., Zavala, V.M., 2021. Mitigating Investment Risk Using Modular Technologies. Computers & Chemical Engineering.

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"Waste-free Cities" Construction and Carbon Emission Reduction in China: Based on the Perspective of Circular Economy

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ABSTRACT

Solid waste and carbon dioxide are important elements of environmental governance. Under the background of carbon peaking and carbon neutrality goals, the research on whether and how to promote the construction of "no waste cities" and carbon emission reduction is of great significance in China. The generation of solid waste and greenhouse gases such as carbon dioxide has the same origin, which can be well coordinated to promote environmental governance.

1. Introduction

According to the World Bank, the total amount of solid waste in the world shows a significant positive correlation with GDP. Compared with the rest of the world, the Asia-Pacific region generates the largest amount of solid waste, accounting for 23% of the world's total weight [1]. In addition, according to the data from the China Statistical Yearbook and the forecasts made therefrom, the amount of solid waste of China generated in 2021 will be 3.8 billion tons, which is still in a stage of slow growth compared with 3.75 billion tons in 2020. In terms of solid waste treatment, China comprehensively utilized and disposed of 3.036 billion tons or 80.96% of solid waste in 2020. In 2021, China will comprehensively utilize and dispose of 3.2 billion tons of solid waste, with a comprehensive treatment rate of 84.21%, a slight increase compared with the previous year, but there is still a big gap compared with developed countries. If these solid wastes are not properly treated and utilized, they will not only cause great waste of resources, but also cause serious pollution to the urban and rural environment of China. In recent years, Japan, the European Union, and Singapore have carried out active attempts and explorations in the comprehensive management of solid waste, which can

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provide reference experience for the pilot construction of "Waste-Free Cities". For example, Japan continues to promote the basic plan for building a circular economy society, the European Commission has successively released "Towards a Circular Economy: European Zero Waste Plan" and "Circular Economy Package", and Singapore has proposed a national vision for "zero waste".

At the same time, with the continuous increase of greenhouse gas emissions, climate issues have become the focus of the international community. The Paris Agreement provides an institutional framework for global cooperation in addressing climate change. More than 100 countries and regions around the world, including China, have pledged to achieve "carbon peaking" and "carbon neutrality" by the middle of the 21st century (referred to as the "Dual-Carbon Goals"). In December 2021, 17 government departments of China including the Ministry of Ecology and Environment jointly issued the "Work Plan for the Construction of 'Waste-Free Cities' during the '14th Five-Year Plan' period" to promote the development of waste reduction and build more "Waste-Free Cities" in China. The relevant indicators of waste reduction and carbon reduction have been adopted in the indicator system of ecological environment improvement [2].

The construction of "Waste-free City" is closely related to the Dual-Carbon Goals and has co-benefits. However, at present, the world is still in its infancy in the coordinated development of "Waste-free City" construction and carbon emission reduction including China, and how to achieve synergy between the two in this process also requires in-depth research. Therefore, this paper starts with the internal relationship between the construction of "Waste-free City" and carbon emission reduction and then uses models and tools to estimate the potential benefits of carbon emission reduction in the construction of "Waste-free City". The long-term goals, path choices and policy suggestions are also provided in the following parts of this paper for a reference of further improvements of China's urban environment construction.

2. Literature Review

The concept of zero waste (zero waste) was first proposed by the "Zero Waste International Alliance (2004)", which advocates reducing the emission of environmental pollutants such as solid waste. "Zero waste" is a solution to reduce the increasing solid waste, and there are great challenges and opportunities to transform traditional waste management into a zero waste vision. A waste-free concept promotes sustainable production, consumption and resource recycling. The United Kingdom, Canada, the United States, Japan and other countries have successively carried out the construction of waste-free cities. Regarding the concept of a zero-waste city, different scholars have expounded the concept of zero-waste from different perspectives. For example, Cole (2014) believes that "zero waste" refers to a way to minimize the impact of waste on the environment, with the goal of preventing waste generation, saving resources, and obtaining all the reuse value of materials [3]. Pietzsch (2017) examines the barriers and factors influencing the achievement of zero waste goals [4]. Lehmann (2012) examines the main principles and core drivers for the construction of "waste-free cities" [5]. Zaman (2013) proposed the Zero Waste Index (ZWI) as an alternative waste management performance evaluation tool for zero waste management systems, claiming that ZWI is a new indicator to measure and compare the substitution of raw materials by urban zero waste management systems [6]. Ozge (2020) takes universities as the research object, reduces waste from the source, and studies the quantity and characteristics of solid waste generated in one year by nature, such as classification, collection, temporary storage, recycling, transportation, disposal and control [7]. Wei Haojie (2019) researched that landfill is an important method for solid waste disposal, but solid waste landfill will have a serious impact on the surrounding environment [8]. At this stage, the comprehensive utilization rate of bulk industrial solid waste in China has been greatly improved, but there are still significant problems compared to its production.

3. The Relationship between the Construction of "Waste-free Cities" and "Dual-Carbon Goals"

(1) Both have the same goal

"Waste-free City" is an advanced urban management concept, it promotes the formation of green development mode and lifestyle, continuously promotes the source reduction and resource utilization of solid waste, minimizes the amount of landfill, and minimizes the environmental impact of solid waste. The long-term goal of the construction of "Waste-free Cities" is to achieve the minimum of solid waste production, full utilization of resources and safe disposal of the whole city, to build an environmentally friendly society. Steady development of the construction of "Waste-free Cities" is a powerful measure to further deepen the comprehensive management and utilization of urban solid waste, as well as an important method to develop a circular economy and achieve the "Dual-Carbon Goals". Therefore, the proposal of "Waste-free City" has been closely related to the goal of waste reduction and carbon reduction.

(2) The realization of the "Dual-Carbon Goals" is inseparable from the urban waste-free development

The "Dual-Carbon Goals" and the construction of "Waste-free City" are the unification of optimal utilization of energy and resources in urban construction, and the organic unification of green city, low-carbon economy and sustainable development for the ecological civilization, which will integrate material flows in social and economic systems, reduce wastes and pollutions, and improve the global environment.

(3) Practice has also proved that strengthening the management of solid waste is conducive to reducing carbon emissions

The pilot practice of "Waste-free City" that has been carried out in China has also fully demonstrated that the construction of "Waste-free City" can play a good synergistic role in promoting waste reduction and carbon reduction. After analyzing the solid waste management and carbon reduction data of 45 countries and regions around the world, the Basel Convention Asia-Pacific Regional Center concluded that by improving the scientific management level of 4 types of solid waste, the corresponding reduction in greenhouse gas emissions can reach 13.7%-45.2%. In addition, according to the calculation of China's Circular Economy Association on the management of solid waste in China, during the "13th Five-Year Plan" period, the contribution rate of reducing greenhouse gas emissions in China through the development of circular economy has reached 25% [9].

4. Estimate of Carbon Emission Reduction in the Construction of Waste-free Cities

According to the report released by the International Energy Agency in 2022, the total global greenhouse gas emissions in 2021 will reach 40.8 billion tons of CO_2 equivalent, a year-on-year increase of about 6%. In addition, according to the statistics of the World Resources Institute (WRI), the greenhouse gas generated by the global waste treatment accounts for about 3.2% of the total emissions, of which the greenhouse gas generated by the solid waste landfill accounts for 2.2%, accounts for 68.75% of the greenhouse gas generated by waste treatment.

From the above data, it seems that the total amount of carbon emissions directly caused by solid waste is not so high. However, it can directly or indirectly contribute considerable carbon emission reduction potential to the world.

Institutions and organizations "Global Waste Management Outlook" jointly published by the International Energy Agency and the International Solid Waste Association "Global Resource Outlook 2019" adopted by the United Nations General Assembly in 2019 "Research Report on Circular Economy Helping Carbon Peaking" issued by China Circular Economy Association in 2021.

There are currently four commonly used international carbon emission reduction accounting models, namely, the Waste Reduction Model (WARM model) developed by the US Environmental Protection Agency, and the Environmental Assessment Model for Solid Waste Systems and Technologies developed by the Technical University of Denmark (The Waste Reduction Model, WARM model). Environmental Assessment of Solid Waste System and Technologies, EASEWASTE model), the Solid Waste Management Green-House Gas (SWM-GHG Calculator) developed by the IFEU Institute in Germany, and the "Solid Waste Management Green-House Gas, SWM-GHG Calculator" developed by the Autonomous University of Barcelona, Spain "No Waste" Greenhouse Gas Emissions Calculator (CO_2 Zero Waste, CO_2ZW Calculator). According to the applicability and characteristics of the above

Table 1. Estimates of carbon emission reduction potential by some institutions and organizations

Institutions and organizations	*Global Waste Management Outlook*, a joint publication of the International Energy Agency and the International Solid Waste Association	*Global Resource Outlook 2019* adopted by the UN General Assembly in 2019	2021 "Research Report on Circular Economy Helping Carbon Reaching Peak" issued by China Circular Economy Association
Type of waste Municipal solid waste;	municipal solid waste; food waste	Mined and processed resources	Industrial solid waste, construction waste, biomass waste, renewable resources, some industrial parts and equipment
Treatment Approach	Landfills, energy recovery and other measures	Recycling	Recycling, Remanufacturing
potential contribution for carbon reduction	10-15%; can be increased to 15-20% if source reduction measures are included	Emission reduction contribution rate reach 25%	In 2020, China has reduced carbon dioxide emissions by about 2.6 billion tons with the contribution rate of emission reduction is 25%, this rate is expected to be 30% during the next 5 years.

four solid waste management GHG emission assessment models, combined with the specific conditions of China, the most suitable model for China's solid waste management carbon emission reduction accounting is the WARM model developed by the US Environmental Protection Agency. The model can be used for carbon emission reduction accounting for the construction of "Waste-free City" and the carbon emission reduction benefit evaluation of each city.

The WARM tool is developed by the U.S. Environmental Protection Agency (EPA) to help solid waste planning and estimate waste management measures to reduce greenhouse gas emissions. It uses emission factors to calculate the greenhouse gas emissions of solid waste under various management modes, containing different solid wastes. Treatment methods: including source reduction, recycling, composting, incineration, landfill, etc. According to the calculation method proposed by Jiang Lingling, Ding Shuang in 2022, from the perspective of the whole life cycle of the product, it can be calculated that the direct carbon emissions and carbon emission reduction benefits of solid waste disposal in China by measuring the disposal of typical solid wastes such as general industrial solid waste, domestic waste, agricultural solid waste and construction waste.

In the past five years, China's general industrial solid waste production has remained at 3 billion tons to 4 billion tons. In 2016, China's general industrial solid waste production was 3.092 billion tons, then reached 3.316 billion tons in 2017.It has grown to 3.675 billion tons in 2020, with a 3.5% compound annual growth rate. Since China's 2022 Statistical Yearbook has not yet been released, based on this growth rate, it can be predicted that China's general industrial solid waste generation will reach 3.8 billion tons in 2021,which is shown in Chart 1.

On the other hand, the comprehensive utilization of general industrial solid waste in China is 2.038 billion tons in 2020, accounting for only 55.45%. The disposal volume was 917 million tons, accounting for 24.96%. The storage capacity was 808 million tons, accounting for 21.98%. The dumping and discarding volume was 1.1349 million tons, accounting for 0.03%. So, it can be deduced that the potential benefits of carbon emission reduction for the solid waste in China is huge. Taking the solid waste utilization level in 2020 as the construction benchmark, and referring to the "14th Five-Year Plan" Period "Waste-free City Construction Work Plan" issued by the Ministry of Ecology and Environment of China and the OECD country's "Waste-free City" construction standards, we set the 2030 vision and 2050 vision for the construction of a

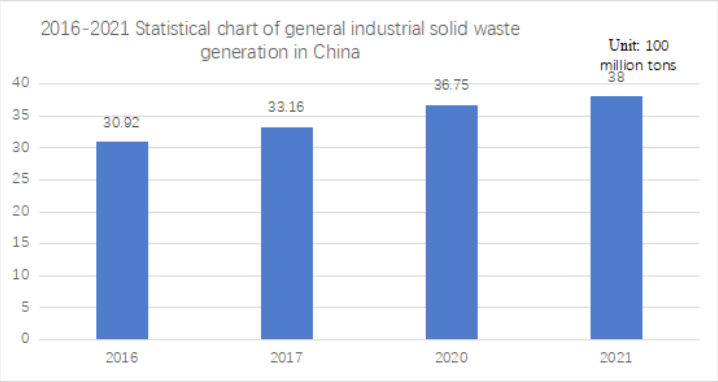

Chart 1. General Industrial Solid Waste Generation in China from 2016-2021

Table 2. Prospects for the construction of a waste-free city

Types of solid waste	Construction benchmark (2020)	Vision for 2030 "Waste-Free Cities" Construction	Vision for 2050 "Waste-Free Cities" Construction
Industrial solid waste	Recycling ratio 55.45%	The recycling ratio is 70%, and the source is reduced by 15%	The recycling ratio is 95%, and the source is reduced by 30%
Agricultural solid waste	Recycling ratio 82%	Recycling ratio 90%	Recycling ratio 100%
Household solid waste	Landfill ratio 33.1%	The landfill ratio is 15%, and the source is reduced by 15%	Landfill tends to 0, and the source is reduced by 30%
Construction waste	Recycling ratio 10%	Recycling ratio 30%	Recycling ratio 60%

"Waste-free City" (see the table below):

The overall carbon emission reduction contribution is expressed in terms of direct carbon emissions reduction from solid waste and benefits caused by the reduction. Direct carbon emission reduction refers to the emissions of greenhouse gas directly generated in the process of landfilling and incineration, and emission reduction benefits refer to the additional environmental and economic benefits (such as increased output value, by-product benefits, carbon trading benefits, etc.) compared with the construction benchmark of the base period.

According to the calculation results of the WARM model, compared with the benchmark level in 2020, the direct carbon emissions reduction of solid waste disposal in China through the construction of "Waste-free City" in 2030 will be about 130 million tons, while the emission reduction benefits from source reduction and comprehensive utilization can reach 1.68 billion tons; by 2050, China's direct carbon emissions reduction through solid waste disposal in "Waste-free City" will be reduced to 35.5 million tons, and the carbon emission reduction benefits from source reduction and comprehensive utilization will reach 5.02 billion tons. The calculation of the model shows that the carbon emission reduction benefits that China can achieve in the next 30 years through the construction of "Waste-free City" are very considerable.

5. Policy Suggestion

The calculation of carbon emission reduction based on solid waste treatment shows that in the construction of "Waste-free Cities", priority should be given as: Reduction of the source>Recycling>Terminal disposal. Further actions of governments such as circular economy supporting policies and green fiscal & taxation policies are also needed. In terms of comprehensive utilization of products, China needs to strengthen the supervision of waste reduction and carbon reduction in all aspects of the whole life cycle products, and strengthen the construction of standard systems for the safety, technicality, quality assessment, pollution control and other standards of recycled resource products in order to enhance competitiveness in the world.

Combined with the OECD countries' experience in solid waste management, the following measures can be taken to promote the coordinated development of "Waste-free City" construction and carbon emission reduction:

(1) Top-level design

According to the different stages of the construction of "Waste-free City", formulate corresponding waste reduction and carbon reduction goals and plans to reduce urban carbon emissions while reducing solid waste.

(2) Source reduction

Eliminate the waste of resources, improve the utilization rate of resources, optimize the production process, and reduce the generation of solid waste from the source.

(3) Strengthen waste collection and transportation management

Establish municipal systematic solid waste recycling services and garbage collection boxes, etc., collect and transport them regularly, strengthen the construction of waste collection infrastructure, and increase the rate of solid waste collection.

(4) Waste disposal management

Through laws and taxes, imp rove different solid waste disposal processes and methods.

(5) Government guidance

Governments need to lead by example by encouraging or mandating green procurement. Incorporate "no waste" goals into contracts for procurement and services. Support reusable and recycled materials within the jurisdiction for municipal road construction and maintenance. Work with service providers to develop recycling goals and provide technical assistance to increase waste recycling or composting rates.

(6) Strengthen publicity and education

The improvement of public awareness of environmental protection will contribute to the construction of "Waste-free City" and carbon emission reduction.

(7) Technical support

Non-governmental organizations and environmental protection departments at all levels can organize and implement a series of waste reduction and emission reduction plans and provide "no waste" technical guidance to residents, enterprises, and government departments.

The construction of a "Waste-free City" requires careful planning and precise layout to achieve carbon reduction while reducing waste and give full play to the synergistic effect of the two, thereby accelerating the pace of urban green and low-carbon development.

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2. The key project of the 2020-2021 Philosophy and Social Science Planning of Jinwan District, Zhuhai City "Research on the Accounting Standards and Operating Mechanisms of the Circular Economy System of the Virtual Eco-Industrial Park in Jinwan District Based on

the Two-dimensional Analysis Framework of 'Material Flow-Value Flow'" (Project No.: 202002).

References

[1] World Bank report. https://openknowledge.worldbank.org/handle/10986/30317.

[2] Ministry of Ecology and Environment's National Waste-Free Cities Pilot Launch https://www.mee.gov.cn/home/ztbd/2020/wfcsjssdgz/dcsj/wfcszcwj/202006/t20200602_782280.shtml.

[3] Cole, C., Osmania, M., Quddusa, M., 2014. Towards a zero waste strategy for an English local authority. Resources, Conservation and Recycling. 89(5), 64-75.

[4] Defra, 2011. Government review of waste policy in England 2011.

[5] Pauli, G., Mshigeni, K., 1998. First five years of action: The zero emissions research and initiatives, 1994-1999. Windhoek: University of Namibia.

[6] Pietzsch, N., Ribeiro, D.J.L., Medeiros, J.F., 2017. Benefits, challenges and critical factors of success for zero waste: A systematic literature review. Waste Management. 67(9), 324-353.

[7] Lehmann, S., 2012. Urban metabolism and the zero-waste city: transforming cities through sustainable design and behavior change. Asian Development Bank. 108-135.

[8] Zaman, A.U., Lehmann, S., 2013. The zero waste index: a performance measurement tool for waste management systems in a 'zero waste city'. Journal of Cleaner Production. (50), 123-132.

[9] Zhang, Y.Y., Jing, Y.Sh., Gao, Q.X., et al., 2011. China's urban solid waste treatment and greenhouse gas emission reduction enlightenment. Environmental Science Research. (08).

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A Study on Influencing Factors of Happiness of Urban Low-income Groups

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ABSTRACT

With the completion of the strategic vision of building a moderately prosperous society in an all-round way in 2020, China's economic development has entered a new normal. The concept of innovative, coordinated, green, open and shared development will lead China's economic progress and development. However, the development of urban and rural areas and regions in China is still not coordinated, and the sudden COVID-19 outbreak has caused a serious impact on urban low-income groups. Due to the characteristics of poor employment stability, low income and single source, as well as greater family pressure of urban low-income groups, the author focuses on the influencing factors of their feelings of happiness. This paper assumes that the satisfaction degree of residents' needs is positively correlated with residents' feelings of happiness. Based on Maslow's hierarchy of needs theory, this paper analyzes the factors that may affect the happiness of urban low-income groups in five levels, and explores the special needs and difficulties of urban low-income groups in the context of the epidemic. So as to find ways to improve the happiness of urban low-income people to provide reference.

1. Research Review

1.1 Research Background

China has achieved success in its strategic vision of building a moderately prosperous society in all respects in 2020. However, as COVID-19 spreads across countries, the situation cannot be taken lightly. China's social and economic development has suffered huge shocks and challenges. At present, China's urban and rural regional development is still not coordinated, and during the epidemic, the urban population is seriously unemployed and unemployed, but the impact of the rural population owning land is not as bad as the urban population. Therefore, the probability of urban low-income groups falling into poverty due to the epidemic has also increased significantly while they have not enjoyed the fruits of social development. However, this is not poverty in an absolute sense, but a low-income situation caused by objective reasons in a relative sense. Therefore, it is necessary to list urban low-income groups as research objects. Through literature review, it is found that the definition of low income in

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China has different classification standards according to different economic development situations and different regions. Meanwhile, the urgency of urban low-income group is also very severe. Therefore, this paper will define the urban low-income group based on relevant data [1].

1.2 Research Objectives

At present, the standard of living of people in various countries is largely measured by economic conditions. Meanwhile, economic growth is also an important factor to improve individual subjective happiness, and people's happiness is also the ultimate goal of national economic development. In economics, the word "utility" is used to refer to "happiness". Economists believe that the positive development of economy and income will make the production boundary move outward, thus bringing higher utility. In addition to the influence of consumption on individual SWB, income also plays an indirect role on happiness index through health status, political factors and social capital. Therefore, under the dual background of economic development stepping into the new normal and the impact of COVID-19, this paper will take urban low-income groups as research objects to analyze the degree of happiness of this group and what factors are at work. At the same time, the judgment of "Easterlin paradox" and the main reason of "Easterlin paradox" happiness is not only related to income, but also closely related to individual characteristics, social characteristics and other factors [2-4].

1.3 Research Significance

1.3.1 Theoretical Significance

Since the 780's of the 20th century, the academic circle has made substantial progress in the study of happiness, for different objects, the influential factors of happiness are also persuasive, but the study of urban low-income groups as a whole, the academic circle has not reached a unanimous conclusion. Therefore, this paper takes urban low-income groups as the research object, and takes happiness as the entry point to study which factors play a role, which is of theoretical significance and also supplements the academic research [5].

1.3.2 Practical Significance

Success in building a moderately prosperous society in all respects and in the battle against poverty means success in the issue of absolute poverty in China. Low income and relative poverty are on the agenda. On the road to achieve common prosperity, the main body of low-income groups should be taken into account. However, existing studies generally focus on poverty in rural areas, while ignoring the large range of low-income groups in cities. The research objective of this paper will also be distinguished from the rural low-income groups [6]. At the same time, the subjective happiness of urban low-income groups is also a social concern, which is the income gap and income imbalance in the process of people's yearning for a better life. Therefore, the study of this problem is of practical and practical significance to accurately and effectively solve the problems of urban low-income groups.Concept definition and theoretical basis [7].

1.3.3 The Connotation of Happiness

Both western and Chinese scholars have different understandings of the definition of happiness. Foreign scholar Diener understood happiness as an individual's subjective feeling about his or her own life state. Andrews, a scholar, judges whether people are happy or not based on their satisfaction with life. If an individual is satisfied with his or her life, he or she will be full of positive emotions, so he or she can be considered happy; otherwise, he or she will be unhappy and negative. Scholar Bradburn divides individual emotion into positive emotion and negative emotion, and believes that individual happiness depends on whether these two emotions can achieve balance, or positive emotion is higher than negative emotion, then individuals can also feel happiness [1]. Therefore, I think happiness is a subjective feeling and expression on the psychological level, but it reflects certain objective phenomena.

1.3.4 Related Theories about Happiness

The research on happiness in China began in the 1980s, and foreign theories and scales were mostly used to measure and study, and the academic circle has reached relevant conclusions on the theoretical basis of happiness [8].

According to the goal and expectation theory, only when the goal or need is achieved, the individual will have subjective well-being. The expected value theory points out that when people evaluate their subjective well-being, they will compare it with a goal or an expectation in their heart, which is a vertical comparison. When the individual sets a higher expectation, because the current situation and expectation gap is too large to produce disappointment, frustration and other emotions and happiness reduced the situation, and expectations too low to easily achieve there will be no sense of achievement, so it is not easy to feel happy. Only when expectations are properly set can people's success after hard work bring joy and happiness.

1.4 The Definition of Urban Low-income Groups

As of the end of 2020, about 900 million people in China have been classified as low-income groups according to the standard of middle-income group set by the National Bureau of Statistics. According to the standard of monthly income level, 710 million people live below 2,000 yuan. There are 310 million people living under 1,000 yuan. According to data from the Ministry of Civil Affairs from April to June 2021, the average standard of minimum living security for urban residents is 693.5 yuan per month, accounting for 19.34 percent of the median per capita disposable income of urban residents in the first half of 2021. At present, China has the following understanding of low income. The first is to equate low income with poverty, and consider low income as people who cannot meet the basic needs of life. The second is to distinguish poverty from low income, which contains low income or low income contains poverty [9]. The third is that low income is a relative poverty after absolute poverty. In the statistical Report on the Development of Civil Affairs in 2020, low-income groups are generally defined by government policies. That is, the relevant groups targeted by the government when implementing policies. According to the current policy, low-income groups are composed of subsistence allowance recipients, social assistance recipients and people prone to returning to poverty.

2. Urban Low-income Groups

2.1 The Relevant Influencing Factors of Physiological Needs

2.1.1 Income Level

For the urban low-income groups, the pressure of survival is the biggest pressure they face, which is an important factor affecting individual happiness index. So whether and to what extent Maslow's first need is satisfied will directly affect their feelings of well-being. Urban low-income groups are at the bottom of the society and have a weak right to speak. They make contributions to social and economic development but do not enjoy the fruits of social development well, and are faced with income inequality and widening gap between the rich and the poor. At the same time, inequality has increased due to class consolidation, the household registration system and unequal opportunities, all of which have a negative impact on happiness. On the other hand, the traditional belief that people should suffer from inequality rather than scarcity has made people more sensitive to such inequities. At the same time, in the context of the epidemic, the employment situation is very severe, the unemployment rate is serious, and the level of work treatment is low. Therefore, the income problem directly affects the subjective well-being of low-income urban groups. The survey shows that in Changzhi, Shanxi Province, for example, the income of low-income groups is generally within the range of 1500-2300, and the income level is not high. People expect better job opportunities and higher and more stable income, but such needs are not well met. Individuals set high goals for themselves to achieve through hard work [10]. If individuals fail to reach the preset goals, happiness will be affected. Only when individuals achieve success after hard work will joy and happiness be brought. Low income and unstable work situation will greatly affect the happiness index of individuals, and individuals expect equality and fairness of opportunity. In the special and difficult social environment, when the injustice of the individual is serious, the feeling of happiness will be greatly reduced. People hope to gradually narrow the gap and change the inequality through their own efforts, and only when opportunities are equal and the degree of fairness is high, the happiness index of urban low-income groups will rise.

2.1.2 Housing Pressure

According to the survey, more than half of the urban low-income people do not own their own house, either in the form of rent, or live in their parents' house, so it can be known that the urban low-income group is also facing a dilemma in housing conditions. So from Maslow's first level of physiological needs, people's housing needs have not been well addressed. However, there is another situation, in which individuals compare with others, when they reach equilibrium without their own property, they can feel happy for a short time. When they are lower than others for a long time, their happiness index will decline. At the same time, people have negative feelings about the pressure they face when their goal of owning their own property has not been achieved, thus reducing their happiness. People's satisfaction with their living environment is relatively high. For urban low-income groups, the most important thing is to solve the employment difficulties, which can be overcome. Under the background that housing system reform and marketization have promoted the rapid development of real estate industry and real estate financialization has made housing price keep rising, housing difficulty has become an urgent problem to be solved. Therefore, housing difficulty is an important factor affecting happiness [11].

2.1.3 Other Survival Pressures

Due to the particularity of urban low-income groups,

whether physiological needs are met and the degree of satisfaction directly affect individual happiness feelings, such as transportation problems and price level. Due to high job instability and low salary level, urban low-income people spend more on transportation to a large extent, which affects their feelings of happiness. At the same time, the life pressure brought by the fluctuation of the price level also affects the subjective happiness of individuals. According to the survey, the price rise will increase the living cost of low-income people who originally had a difficult life. Thus the satisfaction will be reduced, and also bring negative emotions.

2.2 Relevant Influencing Factors at the Level of Security Demand

2.2.1 Job Security: Employment Situation

Most of the urban low-income groups are in a vulnerable position in society. Meanwhile, affected by the epidemic, the unemployment rate is also increasing. Therefore, the urban employment difficulties and low income level are important reasons for the emergence of urban low-income groups. According to the survey data, it is found that a large number of people are unemployed, or people outside the system temporarily maintain their livelihood by working, and the employment situation is not stable. Therefore, according to Maslow's hierarchy of needs, the individual's needs for work security have not been met and realized, so the individual's subjective happiness is not high. Academic scholars have concluded that unemployment will increase workers' psychological pain, so happiness will decline; On the other hand, no income or lower income level after unemployment will also affect individual happiness [12]. Research of existing results also showed a negative correlation between happiness and unemployment, Easterlin, through the survey of people's life satisfaction will be our country in the 1980 s why people happiness boost to employment and welfare level, at the same time that the reform of state-owned enterprises and the social security level is not high is the main cause of this century our country most of the people in happiness, Easterlin calculated that China's happiness in the past two decades showed a trend of decline and then rise, which is in line with the changing trend of happiness in countries in transition. Therefore, it is verified that unemployment is also one of the main factors affecting individual happiness, and also the main factor influencing the low happiness of the urban low-income groups studied in this paper [13].

2.2.2 Health and Safety: Physical and Mental Condition

Maslow's hierarchy of needs theory points out that human survival is the most basic and lowest level of needs, so only when people's lower level needs are satisfied, they will pursue higher level needs. Meanwhile, human safety needs are also the most basic needs of human. Physical and mental health is particularly important in the safety needs. In terms of health, it is found through questionnaire survey that most people are relatively healthy. However, academic studies show that health is positively correlated with happiness, and the more healthy the individual is, the happiness index is positively correlated. Due to the poor economic situation of urban low-income groups, there may be insufficient social security for health problems, and the difficulty of seeing a doctor is also an important factor affecting the happiness of urban low-income groups. Therefore, the academic circles believe that physical health and mental health jointly affect individual subjective well-being. At the same time, individual satisfaction with social security also affects individual happiness index. Urban low-income groups are difficult to afford medical insurance due to their economic difficulties, so whether medical problems are guaranteed directly affects their happiness. Secondly, the continuous occurrence of the epidemic has also brought a serious negative impact on people's mental health, which greatly affects the happiness of low-income groups in urban areas.

2.3 The Relevant Influencing Factors of Emotional Needs

2.3.1 Family Relationships

Family status is an important factor affecting people's happiness, and family happiness is also the lifelong pursuit of every family. For urban low-income groups, it is essential to measure the factors influencing their happiness based on family status. Therefore, marital status is an essential variable to examine, and people in good marriages are happier than those in bad marriages or divorced. People's subjective happiness will be compared with their inner goals, and people are more willing to obtain a stable and long-term happy marriage relationship. A good marriage status can improve individual happiness index to a certain extent, and such expectation can better stabilize family relations. Therefore, family relationship is also the main factor affecting the happiness of urban low-income groups.

2.3.2 External Relations

External relations affect individual happiness, which is manifested in the relationship between friends and neighbors. The external relationship of urban low-income groups is more complex, but the research shows that when the neighborhood interaction is good, the individual happiness will rise. Whether an individual is satisfied with a particular situation depends on the situation of others, so whether the external relationship is harmonious also directly affects the individual's happiness feeling. In addition, academic circles believe that when individuals live in a harmonious social relationship and there is no significant difference in income level, the increase of individual family income is positively correlated with happiness. However, there is a negative correlation between family income and happiness when there is a large income gap among families.

References

[1] Yang, L.X., 2019. Research on common prosperity of low-income Groups. Social Security Review. (04), 70-86.

[2] Wang, H.Y., Wei, H., 2021. Analysis of influencing factors of residents' subjective well-being. Population and Health. (10), 33-37.

[3] Dong, Y.Q., 2021. Society to participate in the influence of the subjective well-being of the elderly research. Shandong university of finance and economics. (09), 12-16.

[4] Xia, Y., 2021. The relationship between subjective well-being and social well-being in China. Nanjing social science. (3), 54-63.

[5] Zhang, L., 2020. Why hasn't economic growth led to increased happiness on the influence factor of subjective well-being review. Nankai Economic Research. (04), 24-45.

[6] Sun, D.Sh., 2020. Research on public service management to improve the well-being of low-income groups. Employment and Security. (07), 176-177.

[7] Feng, Y.Q., Zhang, T.Sh., 2016. Generational differences in perspective of peasant workers' subjective well-being factors analysis. Journal of Population. 38(05), 60-69.

[8] Ning, J., 2016. Study on the influencing factors of farmers' happiness in the process of urbanization. Tianjin University. 22(02), 66.

[9] Cui, H.Zh., 2013. Analysis of influencing factors of subjective well-being of rural elderly -- Based on questionnaire data of rural households in 8 provinces (Regions) in China. (6), 139-160.

[10] Luo, J., Huang, Y.P., Chen, Zh., et al., 2019. Research on housing Demand and housing supply of urban low-income groups: Based on micro-empirical Investigation. (112), 23-28.

[11] Guo, Zh.J., 2020. Research on public Service Demand Expression Mechanism of urban Low-income Groups. Central China Normal University.

[12] Wang, K.J., 2019. A theoretical and empirical analysis of influencing factors of subjective well-being. Journal of Xi'an university of arts and sciences (social science edition). 16(02), 45-49.

[13] Zhao, L.Y., 2019. Public expenditure and farmers' subjective well-being: An empirical analysis based on CGSS data. Finance and Economics. (10), 33.

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