A New "Consumption-production" Market Model

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ARTICLE INFO	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-

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.
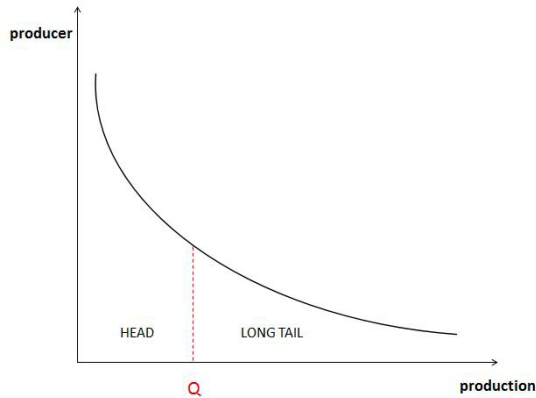

Figure 1. Long tail model

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.
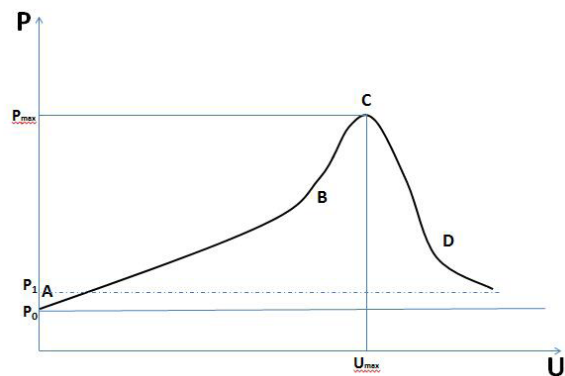

Figure 2. Price-utility model

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.
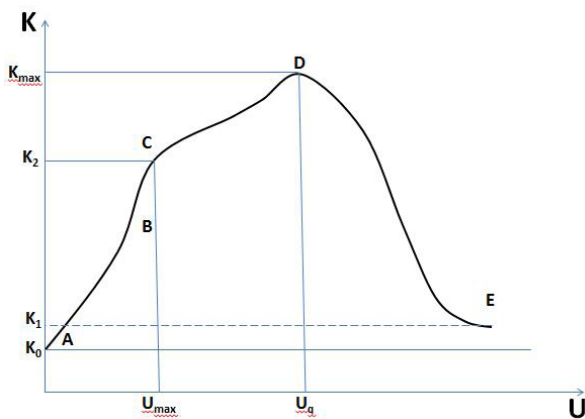

Figure 3. Capital-utility model

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 cap-

ital, 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.
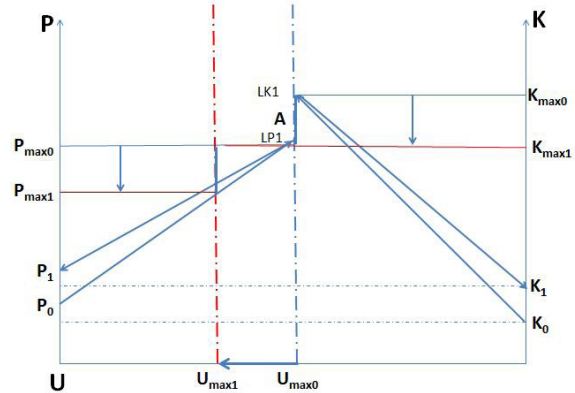

Figure 4. "Consumption-production" maximum utility change

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