Research Article

Modeling and Analysis of the Impact of Information and Communication Technology on Household Consumption Expenditure in Different Regions

Chaozhi Fan, Law Siong Hook, Saifuzzaman Ibrahim, and Mohd Naseem Ahmad

Faculty of Economics and Management, Universiti Putra Malaysia, Serdang, Selangor 43400, Malaysia

Correspondence should be addressed to Chaozhi Fan; gs57155@student.upm.edu.my

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1. Introduction

With the rapid development of mobile businesses, broadband services, and broadcast television businesses in China, the “three-network convergence” is deepening. Broadband, radio, and television entered the era of information and communication technology marked by Internet Plus [1]. At the same time, the penetration, driving, and multiplication of the information and communication technology industry into the national economy are becoming more and more significant, becoming a driver of economic development, and further promoting and accelerating the transformation and upgrading of the national economy [2]. Therefore, this paper studies ICT innovation diffusion and its influencing factors from industrial integration, and the results provide a reference for 5G operation and Internet integration development. The study of literature found that the research on Internet consumer finance and consumer behavior mainly focuses on the influencing factors of residents’ consumer behavior and the relationship between Internet consumer finance and residents’ consumer demand [3]. Scholars generally believe that consumers’ lasting and instantaneous income, unexpected income, income change, consumption habits, and other factors will affect residents’ consumption behaviors. The modern consumption theory starts with the precautionary theory and the liquidity hypothesis. They study the optimal choice of consumers under the condition of uncertainty.

2. Modeling the Impact of Household Consumption Expenditure in Different Regions

2.1. Evaluation Model of Regional Household Consumption Expenditure. To better study the changes and influencing factors of communication consumption of urban residents, this paper attempts to put forward countermeasures and suggestions for the government and enterprises to promote the consumption of urban residents [4]. Therefore, this paper studies the changing structure of information and communication consumption expenditure, as shown in Figure 1.

With the rapid development and renewal of information and communication technology and the continuous penetration in the field of consumption, communication consumption has become one of the important contents of daily
consumption [5]. It is one of the indicators to improve people’s quality of life and promote economic and social development. From the proportion of urban per capita communication consumption in per capita income, it also shows an inverted U-shaped change trend, as shown in Figure 2.

This series of data reflects the current development status of China’s communication industry: compared with residents’ income and other consumption, communication consumption has a relatively downward trend [6]. Furthermore, from the perspective of each region, with the increase of income and consumption, although residents’ communication consumption is also increasing, the communication consumption coefficient and the proportion of communication consumption in per capita income also show a downward trend [7]. Many factors affect the communication consumption of urban residents. To study these influencing factors more scientifically, the following panel data model is constructed, and the specific form is shown in the equation.

\[
Comm_{i,t} = C + \beta'X_{i,t} + \lambda_i + \epsilon_{i,t}. \tag{1}
\]

Advantages of panel data: individual heterogeneity can be controlled. The degree of freedom is increased and the collinearity between explanatory variables is reduced. It is more suitable to study the dynamic adjustment process [8], where i and t represent region and year, respectively; \(Comm_{i,t}\) refers to the per capita communication consumption of urban residents in region i in year t (yuan), that is, the per capita communication consumption calculated according to the permanent resident population of each province and city; \(X_{i,t}\) and \(X_{i,\cdot}\) are the factors that may affect the communication consumption of urban residents; \(\lambda_i\) is the unobservable provincial and municipal effect, which is used to control the provincial and municipal fixed effect; \(\epsilon_{i,t}\) is the residual term; C is a constant term; \(\beta'\) is the coefficient corresponding to each variable. According to the consumption function theory, consumption has inertia [9]. As a kind of consumer goods, communication consumption also has inertia; that is, the current consumption will be affected by the inertia of the previous consumption. The introduction of lag dependent variable is more in line with theory and reality. Therefore, the lag term of communication consumption can be introduced into the model to build a dynamic panel data model. The specific form is as follows:

\[
Comm_{i,t} = a Comm_{i,t-1} + \beta'X_{i,t} + \lambda_i + \epsilon_{i,t}. \tag{2}
\]

To make the data of each year more comparable, the relevant data for these three variables is reduced with 2020 as the benchmark period [10]. At the same time, to reduce the heteroscedasticity of model fitting, take the natural logarithm of these three variables, respectively, and the
corresponding coefficient of the index after taking the logarithm represents the concept of elasticity [11]. The statistical description of each variable is shown in Table 1.

According to the life cycle theory, under limited income constraints, consumers will reasonably distribute all their income among the consumption of various goods to obtain the maximum utility. Compared with the absolute income theory, it emphasizes consumption analysis at all stages of life [12]. Consumers will choose between current consumption and expected consumption and advance future consumption to current consumption, which provides a theoretical basis for the research of Internet consumer finance [13]. Based on the traditional theory, Cox and Ludwig [14] bring consumer credit into the equation of consumers’ intertemporal consumption optimization choice and expound the relationship between consumer credit conditions and residents’ consumption. It is assumed that the consumer credit constraints of current consumers are as follows:

$$D_{t+1} = (1+r)(D_t + C_t - Y_t).$$

(3)

In the formula, $D_{t+1}$ represents the consumer credit in the current period, $r$ represents the established rate of return, $D_t$ represents the consumer credit in the previous period, $C_t$ represents the consumer’s consumption status in the previous period, and $Y_t$ represents the consumer’s income level in the previous period. The current consumer credit $D_{t+1}$ meets the constraints.

$$D_{t+1} \leq D_{t+1} = \frac{1}{\omega} Y_t \exp(\xi_t).$$

(4)

In the above algorithm, $\xi_{t+1} = \phi \xi_t + \epsilon_{t+1}$. Among them, $\omega$ represents a set of determined coefficients, $\xi_t$ represents the impact of external conditions on the current consumer credit constraints, and the basic formula is assumed to obey autoregressive model. $D_{t+1}$ represents the current borrowing limit of consumers. The relationship in the formula shows that residents’ personal income and external impact determine the current consumer credit ceiling [15]. The goal of consumers’ intertemporal choice is to reasonably distribute income to maximize the utility in their life cycle. Therefore, the utility maximization equation of consumers is as follows:

$$\text{Max} U = E_t \sum_{j=0}^T (1+\epsilon)^{-j} u(C_{t+j}).$$

(5)

Select the simple model for quantitative analysis and construct the relationship model between consumer finance and residents’ consumption level. Its advantage is that the model is not limited by specific theories and special environments and can more objectively reflect the actual impact of the Internet on consumer finance and consumer demand [16]. The explanatory variables in the model are divided into three categories: basic variable $y$, core variable $x$, and control variable $K$, where $x$ represents each province on the section, $T$ represents each time, and $P$ represents the individual effect of the region, and $\epsilon$ represents a random error term. $(C_{t+j})$ indicates the explanatory variable, i.e., consumption level [17]. $J$ represents the consumption category, which is basic survival expenditure and development enjoyment expenditure, respectively. $u$ represents the change of consumption level. $u$ represents the basic explanatory variable, i.e., income level. $E_t$ is the coefficient of promoting consumption for income reflecting the impact of income on residents’ consumption. $X$ represents the core explanatory variable, i.e., $\Delta y$ and $\Delta$ [18]. It represents the change of income level and the change of Internet consumer finance level, respectively. $\beta$ represents control variables, that is, other potential variables that may have an impact on urban residents’ consumption. These variables include residents’ savings rate $Con_{it-1}$, the social security level $Icr_{it}$, the urbanization level $Inc_{it-1}$, and other macro variables.

$$\Delta Con_{it} = \beta_0 \Delta Con_{it-1} + \beta_1 \Delta Inc_{it-1} + \beta_2 \Delta Icr_{it} + \beta_3 \Delta Inc_{it} + \beta_4 \Delta K_{it} + \mu_i + \epsilon_i.$$  

(6)

The Bass model is used to study and analyze innovation diffusion. Bass uses probability theory and calculus theory to set up and deduce the innovation diffusion model of durable electronic products, namely, the Bass model [19]. The differential expression of the classical Bass model is

$$n(t) = \frac{dN(t)}{dt} = p[m - N(t)] + \frac{d}{m} N(t) [m - N(t)],$$

(7)

where $d$ is the number of noncumulative adopters; $N(t)$ is the cumulative number of adopters; $m$ is the maximum value of cumulative adopters in the whole life cycle; $P$ is the innovation coefficient, and $p > 0$; $Q$ is the imitation coefficient, and $q > 0$. The new adopter or noncumulative adopter model at time $t$ is

<table>
<thead>
<tr>
<th>Variable</th>
<th>Symbol</th>
<th>Mean value</th>
<th>Standard deviation</th>
<th>Minimum value</th>
<th>Maximum value</th>
<th>Observed value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per capita income of urban residents</td>
<td>Inincome</td>
<td>9.28</td>
<td>0.35</td>
<td>8.69</td>
<td>10.36</td>
<td>377</td>
</tr>
<tr>
<td>Per capita communication consumption of urban residents</td>
<td>Incomm</td>
<td>6.20</td>
<td>0.35</td>
<td>5.26</td>
<td>6.98</td>
<td>377</td>
</tr>
<tr>
<td>Engel coefficient of residents</td>
<td>Ee</td>
<td>37.56</td>
<td>4.25</td>
<td>12.68</td>
<td>52.25</td>
<td>377</td>
</tr>
<tr>
<td>Per capita income tax of working age</td>
<td>Intax</td>
<td>4.36</td>
<td>0.98</td>
<td>2.85</td>
<td>7.23</td>
<td>377</td>
</tr>
<tr>
<td>Real interest rate</td>
<td>r</td>
<td>0.02</td>
<td>1.98</td>
<td>-6.15</td>
<td>4.62</td>
<td>377</td>
</tr>
<tr>
<td>Child support index</td>
<td>Edr</td>
<td>22.58</td>
<td>5.56</td>
<td>9.36</td>
<td>42.06</td>
<td>377</td>
</tr>
<tr>
<td>Average family model</td>
<td>Family</td>
<td>3.20</td>
<td>0.36</td>
<td>2.65</td>
<td>4.68</td>
<td>377</td>
</tr>
</tbody>
</table>
The maximum value of adopter (s*) and the time to reach the maximum value (t*) during (0, t) are obtained by derivation, and their expressions are

\[ S^* = \frac{1}{2} \ln \frac{p}{q} \]

\[ T^* = \frac{1}{2} \ln \frac{p}{q} \]

The parameter estimation of the Bass model mostly adopts the "hybrid" method of the least square method, nonlinear least square method, least square method, and nonlinear least square method. With the development of computer technology, modern intelligent algorithms are more and more used in Bass model parameter estimation [20]. With the deep application of computer technology in econometric analysis, quantitative modeling gradually evolves from section modeling and panel modeling to dynamic spatial panel modeling. Dynamic spatial panel models have stronger explanatory power than reality and better fitting effects. Panel data spatial econometric models are divided into fixed effects and random effects [21]. Compared with the random effect model, the fixed effect model is more applicable than the random effect model, with more robust estimation results and simpler calculation. In recent years, many scholars at home and abroad have used panel data with a fixed effect dynamic spatial autoregressive model for spatial econometric analysis.

\[ Y_t = \mu + \tau Y_{t-1} + \delta W Y_t + \eta W Y_{t-1} + X_t \beta + \xi_t + \epsilon_t. \]

The individual effect term \( \mu \) in the formula does not vary over time and satisfies the requirement that the individual effect \( \mu \) is related to the variable matrix \( X \), consistent with a spatial fixed effect model. The time effect term \( \xi_t \) is consistent in the time dimension and does not vary with individuals, while satisfying the individual effect \( \xi_t \) that is related to the variable matrix \( X \) and is consistent with the time fixed effect model. If it satisfies both individual effect and time effect, the model is consistent with a spatiotemporal fixed effect model. The spatial econometric model partial differential is used to explain the influence of variable changes in the model, and the main diagonal element in the partial derivative matrix is used to represent the direct effect, and the non-diagonal element is used to represent the indirect effect. A spatial dynamic general econometric model of panel data is proposed. At a specific time point, from the partial derivative matrix of \( Y \) expected value corresponding to the K explanatory variable in \( X \) of spatial units 1 ~ n, the expressions of short-term effect and long-term effect are as follows:

\[
\begin{bmatrix}
\frac{\partial E(Y)}{\partial E(x_{1k})} & \cdots & \frac{\partial E(Y)}{\partial E(x_{nk})}
\end{bmatrix} = (I_N - \delta W)^{-1} [\beta_{1k} I_N + \beta_{2k} W],
\]

\[
\begin{bmatrix}
\frac{\partial E(Y)}{\partial E(x_{1k})} & \cdots & \frac{\partial E(Y)}{\partial E(x_{nk})}
\end{bmatrix} = [(1 - \tau) I_N - (\delta + \eta) W]^{-1} [\beta_{1k} I_N + \beta_{2k} W].
\]

The maximum likelihood method (ML) is used to estimate the spatial and temporal static fixed effect spatial model. The quasi-maximum likelihood method is proposed to effectively estimate the spatial dynamic panel SAR model. Using the annual data of 144 countries, the spatial static and dynamic models of panel data are used to study the influencing factors and spatial spillover effects of national defense expenditure. These research results provide a valuable reference for this study. Noncumulative Bass model is used to fit the "bell" classic line of innovation diffusion. City I noncumulative Bass model (Extended) expression is

\[ n(t) = k + m \left( \frac{p + q}{q} \right)^2 \frac{e^{-(p+q)t}}{p^2 \left( q^2 + 1 \right)} \]

where \( n(t) \) represents the year-end arrival number of ICT adopters in the city, and \( K \) is the intercept term. It is necessary to estimate the parameters \( k, m, p, \) and \( q \) in the formula. Model parameter estimation method: this paper uses simulated annealing method to estimate the parameters of ICT innovation diffusion Bass model in 288 prefecture level cities in China, to improve the accuracy of modeling impact analysis.

2.2. Characteristics of ICT Consumption Structure. To reflect the impact of the application of information and communication technology on cost location factors, it is assumed that the transportation cost in economic activities is 0, and all geospatial units are homogeneous and symmetrically distributed on both sides of the equator. At this time, projecting the three-dimensional Earth from the north pole to the south pole onto the two-dimensional plane will form a circular map symmetrical about the equator. It is assumed that the mapping of the Earth \( g \) in the Gaussian plane 2 is a unit circle; see Figure 3.

Figure 4 is the fitted scatter diagram of China cities’ "rank scale." The y-axis is the logarithm of China’s urban population-scale ranking, and the x-axis is the logarithm of the corresponding urban population. The fitted straight-line slope is -1.176437, and its absolute value is the 10-year average Ziff coefficient of China’s urban spatial structure.
As China’s basic industry, the telecommunications industry was the first to implement the government regulation reform. The overall route of the reform is to break the monopoly and encourage competition. Relevant policies and regulatory mechanisms guide the changes in telecom operation patterns. Figure 5 shows the evolution of the consumption market structure of China’s telecom industry.

At present, state space model is widely recognized and used in econometric literature. Economists often use this model to estimate unobservable factors, such as unobservable time series, measurement errors, rational expectations, and long-term income. Many financial time series models such as simple linear model and ARIMA model can be written as special cases into state equations and estimate their parameters. The advantage of state space model is that state variables, i.e., unobservable factors, can be incorporated into the observable model to obtain the estimation results together. Kalman filter has a strong iterative algorithm, and the state space model uses Kalman filter to estimate the parameters. The following is the state space form of the variable parameter model.

\[ y_t = x_t \beta + Z_t \alpha_t + \epsilon_t, \]
\[ \alpha_t = \varphi \alpha_{t-1} + \gamma. \]  

(13)

The process of deriving the best estimate of the state vector in the state space model by using Kalman filter is considering the conditional distribution of the state vector at time and defining the variance matrix and mean value of the conditional distribution.

2.3. Implementation of Impact Analysis of Household Consumption Expenditure. When defining the concept of network information consumption, the author includes the network tools to realize consumption behavior. Therefore, when dividing the types of information products, the electronic information products, including network tools, are also included. In addition to electronic products, another necessary type of information product is literature information resources, which can be divided into printed and nonprinted versions from the carrier’s perspective, as shown in the figure. Information products mainly refer to electronic products and network versions of nonprinting information products for in-network information consumption. Figure 6 shows the consumption categories and grade classification of information products.

Information service is mainly an information value-added activity where the information service subject studies the needs of users, organizes services, transmits valuable and effective information to users, and solves the needs of users. In the network environment, the network information service business is more extensive and powerful, which can provide users with full knowledge coverage and high-quality information, and the carrier forms of information products are more diversified, so that the information needs of different users can be solved efficiently and with high quality. In the network information service, according to the paid meter, it can be divided into paid and free information services. The former mainly includes paid online classrooms, paid online consultations, paid audio-visual resource downloads, etc.; free information services include e-mail, instant messaging, information search, and other services. It is also the most widely consumed network information consumption content among network users. It can also be divided into information acquisition, leisure and entertainment, e-commerce, life service, etc. With the deepening and refinement of user needs, the forms of network information services are becoming more and more diverse. According to different classification standards, they can be divided into different types. It is worth mentioning that, under the network environment, the library’s information service has also been enriched and developed and has become an important provider of network information service. The information behavior of network users refers to the activities that network users use network tools to search, select, absorb, utilize, communicate, and publish network information under the control of information demand and ideological motivation. According to the process from the generation of information demand to the absorption and utilization of information, Yan Hai [22] divided it into information demand behavior, information search behavior, information browsing behavior, information selection behavior, and information utilization behavior. Ren LiXiao [23] divides users’ network information behavior into information release behavior, information search behavior, information selection behavior, information exchange
behavior, information download behavior, information absorption and utilization behavior, etc. From this perspective, information related behaviors completed through network devices (including desktop computers, notebooks, mobile phones, tablet computers) belong to network information behaviors. The difference between network information consumption behavior and network information behavior lies in the word “consumption,” which makes the network information consumption behavior not only have all the behavior modes of network information behavior, but also have some characteristics of network consumption behavior, that is, postconsumption satisfaction evaluation, which promotes the emergence of information release behavior. Figure 7 shows the network information consumption behavior and the relationship between network information consumption behavior and network information behavior.

It is believed that different people will have different sequences of information search behavior, or the same person may have different sequences at different times. Therefore, EIS compares and analyzes the individual information search modes of various social scientists and summarizes the strategic model of information search behavior (Figure 8), which is divided into eight strategies: start, connection, browsing, discrimination, tracking, collection, confirmation, and end [24].
In the traditional environment, scholars use different research methods to explore the construction of information behavior model from different perspectives, which provides an important reference for later scholars. Although network information behavior is still a new research field, the research perspective is focused on the construction of network information search behavior model to ensure the accuracy and effectiveness of modeling and analysis.

3. Analysis of Experimental Results

To avoid the phenomenon of "pseudo regression," it is necessary to test the stationarity of relevant data before regression. Considering that there may be differences in unit roots of panel data, LLC and PP Fisher test methods will be used to test the balance of variables. The test results are shown in Table 2.

The above table shows that when each variable is in the horizontal sequence, each test statistic significantly rejects the original hypothesis of "existence of unit root" at the level of 5%, obeys the zero-order single integer I (0), and can directly enter the model for regression analysis. Due to the lag of dependent variables, the dynamic panel model has an endogenous problem, which can be solved by the generalized moment estimation method. Therefore, the generalized moment estimation method is used to empirically study the influencing factors of communication consumption of urban residents. The research results are shown in Table 3.

From the measurement results, according to the standard deviation corresponding to the estimated coefficient, Sargan test and residual sequence correlation test, the two-step estimation of difference GMM and System GMM is better than one-step estimation. The joint significance Wald test results of two-step estimation of differential GMM and System GMM show that the model is very significant in general. The $P$ values of Sargan test are greater than 0.05, indicating that the instrumental variables are effective as a whole. The results of AR (1) test and AR (2) test show that...
there is only first-order sequence correlation, but no second-order sequence correlation. The greater the $p$ value of Sargan test is, the more it can explain the effectiveness of instrumental variables. From the estimation results, the System GMM two-step estimation is better than the differential GMM two-step estimation. Therefore, take the System GMM two-step estimation as an example for analysis. Figure 9 shows the scale of Internet users and Internet consumption in China and Figure 10 shows the consumption scale and proportion of mobile Internet users in China is used for further analysis.

The System GMM two-step estimation shows that the per capita communication consumption of urban residents is affected by many factors. Among them, the lag of the logarithm of per capita communication consumption of urban residents in the first period has a significant impact on the current period, and the estimation coefficient is 0.561, indicating that the per capita communication consumption of urban residents will be affected by the previous period, reflecting that communication consumption is an aspect of residents’ consumption; it also has strong consumption inertia. The logarithm of per capita income of urban

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Table 2: Balance test of variables.

<table>
<thead>
<tr>
<th>Variable symbol</th>
<th>Inspection form</th>
<th>LLC inspection</th>
<th>PP Fisher test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Statistic</td>
<td>Probability value</td>
</tr>
<tr>
<td>Inincome</td>
<td>(c,t,o)</td>
<td>-5.351283</td>
<td>0.0000</td>
</tr>
<tr>
<td>Incomm</td>
<td>(c,t,o)</td>
<td>-9.521436</td>
<td>0.0000</td>
</tr>
<tr>
<td>Ee</td>
<td>(c,t,o)</td>
<td>-19.3568</td>
<td>0.0000</td>
</tr>
<tr>
<td>Intax</td>
<td>(c,t,o)</td>
<td>-3.254786</td>
<td>-0.0004</td>
</tr>
<tr>
<td>r</td>
<td>(c,t,o)</td>
<td>-22.8135</td>
<td>0.0000</td>
</tr>
<tr>
<td>Cdr</td>
<td>(c,t,o)</td>
<td>-8.05868</td>
<td>0.0000</td>
</tr>
<tr>
<td>Family</td>
<td>(c,t,o)</td>
<td>-7.36586</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

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Table 3: Generalized moment estimation results of dynamic panel of communication consumption of urban residents.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Differential GMM</th>
<th>System GMM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One-step prediction</td>
<td>Two-step prediction</td>
</tr>
<tr>
<td>Inincome</td>
<td>0.262*** (0.047)</td>
<td>0.265*** (0.021)</td>
</tr>
<tr>
<td>Incomm</td>
<td>0.523*** (0.052)</td>
<td>0.532*** (0.035)</td>
</tr>
<tr>
<td>Ee</td>
<td>-0.012*** (0.002)</td>
<td>-0.021*** (0.003)</td>
</tr>
<tr>
<td>Intax</td>
<td>-0.052*** (0.021)</td>
<td>-0.053*** (0.012)</td>
</tr>
<tr>
<td>R</td>
<td>0.008* (0.002)</td>
<td>0.008* (0.003)</td>
</tr>
<tr>
<td>Cdr</td>
<td>-0.002 (0.002)</td>
<td>-0.002 (0.003)</td>
</tr>
<tr>
<td>Family</td>
<td>-0.066** (0.032)</td>
<td>-0.055** (0.015)</td>
</tr>
<tr>
<td>Obs.</td>
<td>315</td>
<td>315</td>
</tr>
</tbody>
</table>

Figure 9: Scale of Internet users and Internet consumption in China.
residents also has a positive and significant impact on the logarithm of per capita communication consumption. For every 1% increase in per capita income of urban residents, per capita communication consumption will increase by 0.158%. This also confirms Keynesian consumption theory that income is a function of consumption and income is the main factor affecting consumption demand. As an indispensable kind of consumption in contemporary life, communication consumption is naturally affected by income. The logarithm of the per capita personal income tax of the working age population has a significant negative impact on the logarithm of the per capita communication consumption of the residents. For every 1% increase in the per capita personal income tax of the working age population, the per capita communication consumption of the residents will decrease by 0.034%, which shows that the increase in the per capita personal income tax will hinder the communication consumption of the residents. This is also in line with the reality. When the individual income tax of residents increases, the disposable income naturally decreases, which affects the communication consumption. Different consumer groups have different income levels, so their consumption ability and consumption tendency will be different, which makes their consumption expenditure on communication services very different. According to the statistical norms of the National Bureau of statistics, all survey households are ranked from low to high according to their per capita disposable income and are divided into seven levels: lowest income households, low income households, lower middle income households, middle income households, upper middle income households, high income households, and highest income households. Table 4 shows the per capita communication consumption of urban residents in China by level.

![Image of Table 4: Per capita communication expenses of urban residents of different income levels.](image)

![Image of Figure 10: Consumption scale and proportion of mobile Internet users in China.](image)

![Image of Figure 11: Comparison of per capita communication cost difference among residents of different income levels.](image)
From the “total average” in the second column to the “highest income households” in the last column, the per capita communication consumption expenditure of urban residents and communication consumption expenditure at all levels in China show an increasing trend, and the “total average” annual growth rate is about 17%. Further analyze and record the expenditure of communication consumption of residents at all income levels, as in Figure 11.

It can be found that there are great differences in the communication level and growth range of different income classes. Taking the difference of per capita communication fee between low income households and high income households as an example, this paper makes a comparative analysis. In terms of consumption level, there is a great gap between low income households and high income households. The consumption expenditure of the highest income households is 15 times that of the lowest income households. In terms of growth rate, high income households are 8 percentage points higher than low income households. To observe and compare the per capita communication expenses of urban residents of different income levels in China, the figure can be used for comparative analysis more intuitively.

4. Conclusion

The communication consumer price index is one of the important factors affecting the change in communication consumption of urban residents in China, which shows that the pricing mode of the telecom business is bound to have a substantial impact on residents’ communication consumption. Due to the fierce competition in the telecom market, major telecom operators launch new services and fight a price war at the same time. Therefore, disorderly competition may be the biggest threat to the sustainable development of the telecom industry. The telecom service pricing model is not only related to the profits of telecom enterprises, but also related to the development prospects of the whole telecom industry. With the relevant government departments gradually paying attention to the supervision of telecom prices, there are still unreasonable standards in the service pricing of the telecom market, which is a problem that communication enterprises must solve. Therefore, telecom operators must actively adopt more scientific telecom service pricing models and methods. Firstly, we should follow the principle of classified pricing for different telecom services. For example, for new business pricing, the operator should independently determine the tariff according to the market. The basic telecommunications industry has the typical nature of a natural monopoly. Various basic telecommunications services have accumulated a large amount of funds for the competition and development of other services. Its pricing can adopt the government’s guidance price or government pricing based on cost accounting. The second is to comprehensively consider market and user factors. Facing the complex and changeable situation of the telecom market, a single pricing model cannot meet the changing needs, nor is it conducive to enterprises’ giving full play to their respective business advantages. Therefore, the tariff for the same service can also consider the different needs of different customers in the market as much as possible, provide customers with a variety of tariff schemes, subdivide the user group, and increase the selectivity of the telecom tariff. Finally, operators should strengthen the research on pricing methods to ensure the enforceability of the pricing model and make the pricing model more competitive.

Data Availability

The labeled dataset used to support the findings of this study is available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflicts of interest.

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References


