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Could Consumer Economic Environment Impact the Spread of Chinese Smartphone Brands: Evidence from a Hierarchical Regression Analysis

Karamoko N'da[1]*, Jiaoju Ge[1], Steven Ji-Fan Ren[1], Jia Wang[2]

[1]School of Economics and Management, Harbin Institute of Technology (Shenzhen), Shenzhen, China
[2]School of E-Commerce and Logistics, Suzhou Institute of Trade & Commerce, Suzhou, China
Email: *andabuy@yahoo.com, jiaoge@hitsz.cc, renjifan@hitsz.cc, wangjia@szjma.edu.cn

Abstract

Despite the impact of buyers' economic environment on the spread of Chinese product brands worldwide through Chinese's International Online Shopping (CIOS), very few researchers are interested in it. Based on 19,493 purchases of Chinese smartphone brands, transaction variables, consumer economic environment data, and a hierarchical regression model, we investigated how consumer economic environment and transactional variables differentially assess consumers' preferences for Chinese smartphones. The result showed that the consumer economic environment positively influences smartphone choice preferences. Thus, the study improves practitioners' understanding on Chinese smartphone globalization and contributes to a better understanding of the Chinese international Online shopping Market (CIOSM). Such a model can be used to guide e-retailers and brand managers.

Keywords

International Online Shopping, Consumer Economic Environment, International Online Consumers, Chinese Smartphone Brands, Choice Preferences

1. Introduction

The internet and the technological revolution have enabled sellers and buyers to trade closer than ever (Chmielarz et al., 2021). Henceforth, buyers and sellers are no longer limited to national online marketplaces; instead, they can buy and sell

in broader and international markets (Liu et al., 2022). In this direction, consumers from various countries increasingly use the Chinese International Online Shopping (CIOS) framework to purchase Chinese product brands from China (Ma, Chai, & Zhang, 2018). Since 2015, China has exceeded the USA's leadership in International Online Sales (IOS) with about $628.26 billion in turnover from IOS' B2C sales only (Liu et al., 2022). Moreover, every year, this growth is increasingly expanding to all of the sale modes of CIOS (B2B, B2C, and C2C) (Ma, Chai, & Zhang, 2018). However, prior research has only primarily focused on either the impact of CIOS in Chinese international trade or the factors determining the success of CIOS from the perspectives of sellers or purchasers, such as laws, regulations and taxes, despite the unprecedented growth of CIOS and its significance in the sales of Chinese products worldwide (Liu et al., 2022). Only very few studies have focused on buyers' economic environment in analyzing Chinese product brands on CIOS platforms (Ding et al., 2020). Nevertheless, international buyers' economic environment may be seen as the foundation of their buying decisions and behaviors (Ding et al., 2020). Moreover, despite the varied origins of International Online Consumers (IOCs) buying Chinese product brands from the CIOS framework, very little is known about their choice preferences of different Chinese product brands. As a result, this research purpose is to investigate the effect of IOC's economic environment on the choice preferences of Chinese product brands. In other words, the study primarily seeks to determine the effect of factors measuring Countries' Level of Economic Development (CLED) on choice of Chinese product brands, especially Chinese smartphone brands.

Chinese smartphones are the most sold out in China from the CIOS framework (Qi et al., 2020). Therefore, this study's framework concerns only the IOCs' choice preferences of Chinese smartphones. Since consumers' economic environment somehow guides their choice tendencies about transaction factors, we added to factors of CLEDs, transactional factors, to examine consumers' choice preferences about Chinese smartphone brands. Accordingly, we utilized a Hierarchical regression model to investigate how CLEDs' factors and internal transaction factors differentially assess IOCs' choice preferences of Chinese smartphone brands. We found out that CLED does influence consumer choice preferences.

This study improves the CIOS literature by integrating, along with internal transaction variables, factors associated to countries economic environment to explore how these two groups of elements influence the choice preferences of IOCs regarding Chinese smartphone brands. The study has substantial implications for e-sellers of CIOS who sell Chinese product brands to IOCs. Consider a seller that sells Chinese product brands to IOCs through CIOS. Such a seller might be interested in comprehending the impact of CLEDs' factors associated with the internal transactional factors on consumers' choice preferences. In that context, the study can be perceived as a guide for sellers.

2. Literature Review

As a new trade channel at the international level, CIOS is the new gateway for Chinese product brands into the global market (Liu et al., 2022). It is incommensurable in Chinese international commerce (Liu et al., 2022). According to Fan (2019), CIOS has profoundly changed the traditional global commerce model regarding easiness and services. It constitutes an excellent framework for Chinese companies and brands to strengthen their competitiveness in the international market by knowing IOCs' demands and reducing transaction time and costs (Niu & Li, 2017). According to Mooney (2018) and Liu and Jiang (2017), since 2012, CIOS has become the leading market for IOS worldwide, with a growth rate of 30% annually. According to (Liu et al., 2022), this rapid emergence of CIOS is based on two fundamental pillars: the internet and logistics. These factors made access to the Chinese market better-off by eliminating traditional obstacles, excessive gain, and permitting ease' of payment modes for the IOCs (Yang & Shen, 2015). According to Niu and Li (2017), technological developments and the advantage of Chinese product brands' prices are the core factors of the rapid growth of CIOS. This rise of CIOS opened up broad perspectives for Chinese brands and companies in the global market (Niu & Li, 2017). In this context, many Chinese companies and e-sellers use it to get new market shares at the global level (Bartikowski, Fastoso, & Gierl, 2019). According to the data released by the Chinese government, about 5000 CIOS platforms and more than 200,000 enterprises are operating in the CIOS field (Fan, 2019). SMEs and self-employed businesses represent 90% of the total (Li & Xing, 2016). The transaction volume through CIOS since 2014 reached RMB 3 trillion, with RMB 300 billion for retail businesses (B2C transactions) (Mou, Cohen, Dou, & Zhang, 2020). In 2018, customs data revealed that purchases through CIOS had reached a record of $2.46 trillion, an increase of 7.1% from previous years (Zhong, 2019); enabling China to preserve its position as a superpower in terms of commerce of manufactured products at the international level (Mou, Cohen, Dou, & Zhang, 2020). Since then, many studies investigated the CIOS and its effect on Chinese economic growth (Liu et al., 2022). For instance, Liu and Liu (2017) studied the development stages of the CIOS and its effects on Chinese international trade. They have shown that the CIOS has been developing continuously from year to year since its advent. Li and Xing (2016) investigated seller behaviors. They highlighted the negative effect of those behaviors on sales. Mou et al. (2019) studied buyers' criticisms of sellers and pointed out the adverse effects of purchasers' criticisms on purchases. Guo et al. (2018) examined sellers' trust and positively affected buyers' purchase behavior. Wang et al. (2017) highlighted the adverse impact of the taxes and logistics costs on purchases. He and Xu (2018) examined the issues related to CIOS and its profit, marketing, and supervision models. They have demonstrated that this market has been steadily growing ever since it first emerged, offering the products branded "*Made in China*" more opportunities worldwide. They pointed out that innovation of CIOS must be done to en-

hance competitiveness through the supply chain and logistics development. Fang (2017) presented the situation of CIOS, compared commercial models and different markets related to it, and examined the solutions regarding essential issues undermining CIOS development, such as customs clearance issues. Likewise, many works have been interested in CIOS development, focusing on the transaction environment's factors from the sellers' side (e.g., logistics, laws, regulations, and government policies).

In the IOS, customers' trust is greatly influenced by the transaction environment on the vendors' side. In this regard, Li and Xing (2016) have shown that factors constituting the sellers' side's transaction environment, such as taxes, logistics, and regulations, impact the development of CIOS. In this direction, Yang, & Shen (2015) stated that issues such as product inspection, clearance, lack of oversight, and challenges with conflict resolution hamper the growth of CIOS development. Therefore, starting in 2017, China's government established a series of regulations to address such problems and advance the growth of CIOS (Li & Xing, 2016; Liu et al., 2015; Wang et al., 2017). That strategy of the Chinese government has encouraged researchers to focus on comprehending the effects of internal transaction factors affecting purchases. In this perspective, Mou et al. (2017) have shown that price and perceived value impact consumers' purchase intention. Guo et al. (2018) demonstrated that consumer trust is essential for consumer purchases. However, although those studies have contributed to understanding the state of CIOS and consumers' purchases from transaction factors, very limited study has focused on the external factors from the purchaser side. That is to say, the economic environment of the buyer. Previous works have concentrated mainly on factors influencing buyers and sellers during the transaction (internal transaction variables). Accordingly, this research aims to investigate the impacts of external transactional variables based on buyers' economic environment. We decided to it so to understand how buyers' economic environments influence international consumer purchase preferences of Chinese smartphone brands.

2.1. External Transaction Factors from the Buyers Side: Economic Environment

This study concentrates mainly on comprehending the type of smartphone consumers prefer according to the economic setting. Like other smartphone brands, Chinese smartphone brands have several products according to processing power. Consequently, consumers are faced with several choices regarding the type of smartphone to buy according to their purchasing power. These consumers come from different social and economic settings. In the domestic online shopping purchase framework, purchasers' choices and purchases studied from internal transaction factors perspective, such as price, feedback, logistics, etc. However, additional variables that have not been considered yet could probably influence buyers' choices. Those variables are related to the purchasers' economic surroundings and other external conditions. These elements provide a broad pic-

ture of IOC preferences and behavioral tendencies.

2.2. The Effect Country's Economic Environment on Smartphone Choice Preferences

As an essential medium for international trade, the internet allows consumers from different countries to purchase products outside their country's borders (Qi et al., 2020). Those buyers come from various countries in terms of economic development level. There is evidence that consumers from different countries in terms of economic background do not have the same preference trends (Mahmood, Bagchi, & Ford, 2004; Strizhakova & Coulter, 2015). Accordingly, one could assume that developed countries' choice preferences will be different from those of under developed nations in terms of smartphone buying habits (Ahmad, Ahmed, & Ahmad, 2019). However, only a few studies have tried to study consumer choice preferences based on their CLED. Therefore, this research is intended to fix this gap within the literature.

2.3. Theoretical Development and Hypotheses

This article's main objective is to study IOCs' smartphone choice preferences based on their CLED. In this direction, the study seeks to determine the effect of the buyers' economic environment on Chinese smartphone brands' choice preferences. We also study the influence of the internal variables related to their choice tendencies, i.e., price and logistics cost, since we consider that a buyer's economic environment influences its choice tendencies of internal transaction components. Consequently, we associated consumers' economic environment with internal transaction factors. Thus, the theoretical model is based on variables that describe purchaser economic environment (such as income level) and internal transaction elements that have an influence on purchases throughout the transaction process, such as pricing and logistic cost.

2.4. The Theoretical Framework

In international commerce, comprehending consumers' choice preferences from an economic perspective has always been a marketing challenge because of countries' differences in terms of economics (Jamalova & Milán, 2019). Those economic disparities among countries raise issues concerning the foundations of consumer preferences and how consumers' soco-economic status impacts their purchasing decisions regarding product brands for public use, like smartphones. In this regard, Mahmood, Bagchi, and Ford (2004) highlighted that consumers' preferences vary depending on the socio-economic context. Qi et al. (2020) pointed out that the social-economic indicators, such as the income level of a given environment, influence consumers' ability to purchase goods. In this direction, Jamalova and Milán (2019) studied the effect of economic variables such as GDP per capita on smartphone consumer purchase decisions in different economic backgrounds. They showed that the economic context was essential

for analyzing purchasers' purchasing power. They pointed out that, according to the economic context, consumers prefer different ranges of smartphones in terms of price or quality and behave differently during the purchasing process. They have shown a strong influence of a country's income level on smartphone choice preferences.

Some studies have also analyzed consumer purchases according to the socio-economic contexts and other internal transactional variables within different countries. For instance, Uddin et al. (2014) demonstrate that in Bangladesh, price and environment have a significant role in influencing customers' decisions to purchase smartphones. Price, features, and service all have an impact on people's preferences for smartphones, according to researchers Karakaş and Öztürk (2016). According to Shabrin et al. (2017), factors such as product features, price, and the social context have an influence on Malaysian consumers' choices for smartphones. Rahim et al. (2016) found that social influence is a crucial element influencing Malaysian consumers to select a certain smartphone brand when purchasing a smartphone. Thokchom demonstrated by analyzing factors affecting Indonesian consumers' buying intention of smartphones that price and brand image are the most important factors that guide consumers' choice preferences. A positive and significant link between price, quality, brand, and consumer smartphone choices in Vietnam was demonstrated by Wollenberg (2014). Accordingly, we added to economic factors the internal transaction factors that consumers rely on during the purchase process, such as smartphones' processing powers, prices, and logistics. Therefore, the study aims to identify the impact of economic environments and their choice tendencies when facing internal transactional factors. Figure 1 presents the conceptual framework.

2.5. Income Level and Internet Access Level

Grasping consumers' purchase behavior requires understanding a nation's economic growth (Jamalova & Constantinovits, 2020). In doing so, scholars argue that a country's macroeconomic indicators are essential to gauge consumer preferences and behaviors (Jamalova & Constantinovits, 2020). These macroeconomic variables offer a broad picture of the social-economic level to comprehend people's purchasing power and spending habits. Accordingly, the current study adopts the following factors for measuring economic development: 1) countries' income levels based on World Bank classification; and 2) the rate of internet access.

The World Bank categorizes nations yearly according to their income level. That classification is used to assess the economic development levels of the countries. The categorization is divided into four groups based on the income levels (e.g., low, lower-middle, high-income, and upper-middle). According to Jamalova and Constantinovits (2020), the income level is essential to purchasing product brands like smartphones. Income is a key variable in determining customers' purchasing power and brand preferences, and it is also one of the key
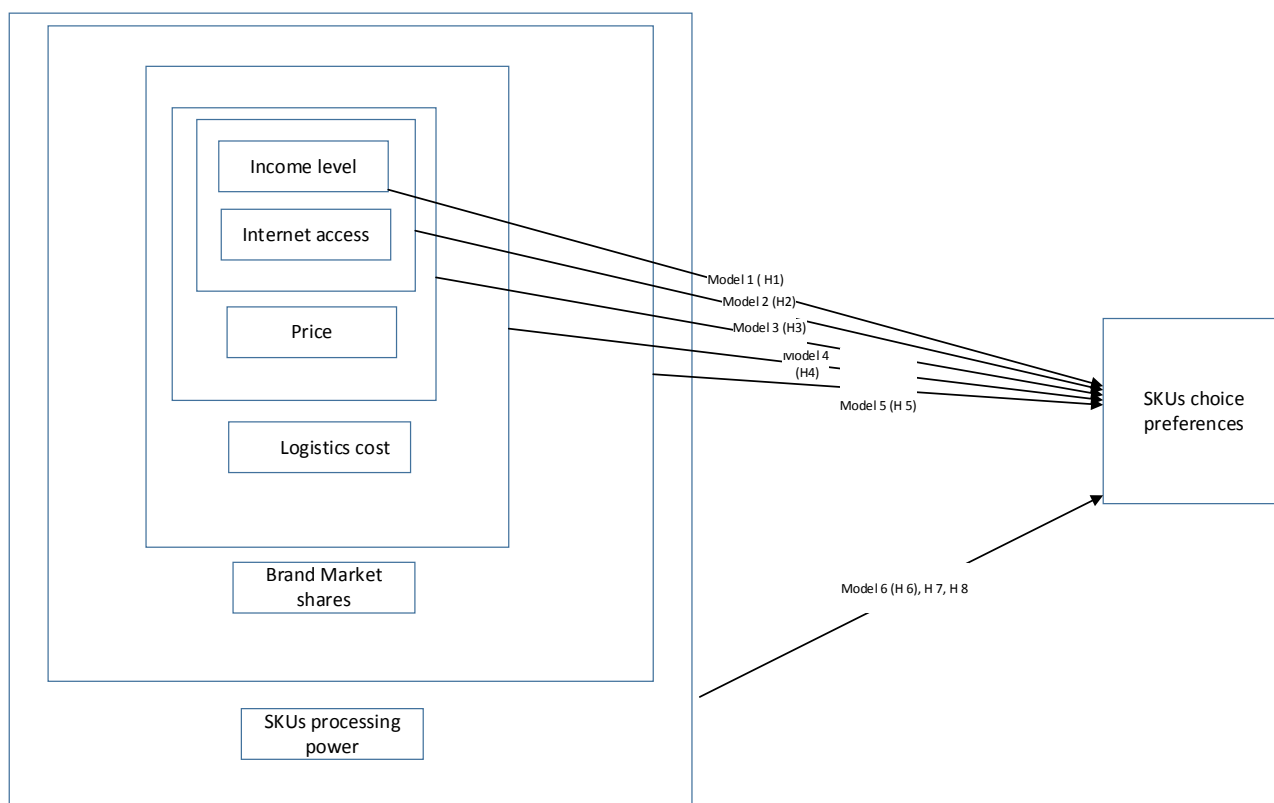
Figure 1. Conceptual framework.

variables that highlight countries' variations in smartphone preference (Jamalova & Milán, 2019). In this direction, James (2016) shows that smartphone spread is related to income in emerging countries. Jamalova and Constantinovits (2020) showed the imbalance in the purchase of phones in regions of the world is due to the income level. Numerous studies have shown that smartphone buying is impacted by income level (Reid, 2018). According to Reid (2018), 30% of low-income Americans do not have smartphones. Therefore, we have incorporated into the model the countries' income levels based on World Bank classification to indicate the countries' purchasing power.

The internet has driven essential consumer purchasing behavior changes worldwide (Rahman et al., 2018). Today, online purchasing is receiving substantial attention from many consumers worldwide (Lawrence & Tar, 2010; Rahman et al., 2018). In this context, Lawrence and Tar (2010) show that the lack of suitable socio-economic infrastructures such as internet access creates substantial barriers to developing online shopping in developing countries. A report by OECD in 2004 has shown that the level of Internet connection in developing countries affects consumers' decisions to adopt online purchase mode. Since the purchases are made online, the internet access level can indicate the countries' development levels, consumers' ability to purchase online, and preference patterns. We started with the idea that in developed countries with easy internet access, consumers use their smartphones to surf the internet

and shop online. Consequently, consumers in those countries may need more powerful ROMs and RAMs than consumers in underdeveloped countries, where internet access is more challenging and online shopping less developed. Therefore, the study integrated the internet connection rate as an economic variable into the model to assess its influence on consumers' preferences in purchasing Chinese smartphone brands. Accordingly, we propose the following hypothesis:

H1: The income level positively influences consumers' choice preferences of Chinese smartphone brands.

H2: The internet access rate positively affects consumers' choice preferences for Chinese smartphones.

2.6. The Effects of Internal Transaction: Price, Logistics Cost, Brands' Popularity and Smartphone Processing Power

Price has historically been regarded as a crucial factor when purchasing products (Seduram et al., 2022). Gallice and Sorrenti (2022) identified it as a significant factor affecting consumers' satisfaction. Some works have already investigated the role of price on the choice process in the CIOS framework. For instance, Chen, J., Tournois, N. and Fu (2020) have shown that price influences consumers' choice preferences in the CIOS framework. Therefore, the study included the price as an internal transaction variable to study its effect on IOCs' choice preferences. However, in IOS, product price is not the only those consumers worry about. Customers also have to worry about paying customs duties. Since customs costs and procedures vary from nation to nation, we did not consider them. Online shopping and logistics have always been examined largely from a national standpoint. IOS logistics, however, are distinct from domestic ones. Research has shown that logistical features, such as logistics cost, significantly impact online shopping. For instance, Nguyen, de Leeuw, and Dullaert (2018) pointed out that logistics costs are particularly crucial for online purchasers. It serves as a marketing tool for influencing a consumer's purchase decision. Xinman Lu et al. (2022) found that logistics costs significantly affect consumers' purchase patterns and sizes. As a result, we incorporated the logistics cost into this model for studying IOCs' choice preferences of Chinese smartphone brands.

Smartphone purchases are a decision that might be associated with other factors specific to each business environment, such as popularity of brands in countries. To account for that variable's effect, we integrated into the model market shares of brands to control brands' popularity differences between countries. In developed countries with easier access to the internet, consumers spend a lot of time on the internet and use their phones to surf the internet and store data. Therefore, their preference for smartphone processing capability might differ from that of consumers in developing countries. According to Ahmad, Ahmed, and Ahmad (2019), RAM and ROM are the basis of smartphones' processing power. Accordingly, we utilized those two features to quantify the

smartphone processing power (SMpp) and see how those variable influences consumers' choice preferences. Hence, given above, we propose the following hypothesis:

H3: The price positively influences consumers' preferences for Chinese smartphones.

H4: Logistics cost positively affects Chinese smartphone brand choice preferences.

H5: Brands' popularity within countries positively influences consumers' choice preferences of Chinese smartphone brands.

H6: The smartphone processing power positively influences consumers' choice preferences for Chinese smartphone brands.

H7: The smartphone processing power more robustly impacts consumers' choice preferences than income level and Internet access rate.

H8: The Income level and the Internet access rate together have a more robust impact on consumers' choice preferences of Chinese smartphone brands than all other variables considered in the study.

3. Methodology

3.1. Chinese Smartphone Brand Market Worldwide

According to Jamalova and Constantinovits (2020), by the end of 2018, the number of smartphone owners worldwide was around 5.2 billion. In this regard, China, the second economy worldwide, possesses one of the largest markets for smartphone brands. Li (2019) estimates that 12 of the 76 smartphone brands sold worldwide, including Huawei, Xiaomi, VIVO, Oppo, Vivo, and Oppo, are Chinese brands. However, we choose only four of them to carrit out our investigation. Huawei smartphones (Li & Wei, 2019) are sold in more than 170 nations. With a 28.1% market share in the second quarter of 2018, Huawei was the leading smartphone brand in China. Huawei and Xiaomi were ranked among the top five smartphone brands in China by the third quarter of 2018 (Li & Wei, 2019). The sales of Oppo goods fell by over 3% at the same period, while Huawei sold around 30.72 million smartphones with a share of 28.6%, followed by Xiaomi, which sold about 12.61 million items with a share of 11.7% (Li & Wei, 2019). In 2014, Xiaomi, the fourth-largest phone brand in the world that produces high-quality but affordable smartphones, was ranked as the leading manufacturer of smartphones in the Chinese market (Tabassum & Ahmed, 2020). With 12.1 million phones sold and a market share of roughly 28.8% during the third quarter of 2018, it has overtaken all other phone brands in the Indian market (Tabassum & Ahmed, 2020). In the Chinese market, the Vivo brand's market share climbed from 2008 to 2014 to about 9.88% (Yu et al., 2020).

3.2. Dataset Structure

Using Octopus Software and the Google spreadsheet programming language, transaction data from 63 CIOS retail businesses has been gathered. These 63 re-

tailers comprised both brand stores and independent merchants. The shops sell in B2C mode. The dataset consists of 19493 transaction data of 4 Chinese smartphone brands bought between December 2021 and July 2022 by customers from 109 countries. China has more than 12 smartphone brands. However, we chose to concentrate on the top four smartphone brands that sell to IOCs via the CIOS platform. Namely Huawei (Br0 = 0), Xiaomi (Br1 = 1), Vivo (Br2 = 2), and Oppo (Br3 = 3). The dataset is distributed as follows Huawei 43.62%, Xiaomi 48.54%, Vivo, and Oppo 7.84%.

The model deals with IOCs' purchase preferences of these four Chinese smartphone brands. Accordingly, the categories have been chosen based on their processing power. That is to say, their ability to treat and store information, namely, Random Access Memory (RAM) and Read-Only Memory (ROM). The dataset contains 18 categories distributed as follows: 6 for Huawei, 4 for Xiaomi, 4 for Vivo, and 4 for Oppo. Likewise, the dataset contains variables regarding consumers' socio-economic environment. That is to say, countries' income levels and internet access rates.

We downloaded the countries' income levels from the World Bank website (World Bank, 2021). Each year, World Bank classifies countries into four groups from their income levels. Namely, Higher Income countries (H), Lower Income countries (L), Lower Middle-Income countries (LM), and Up Middle-Income countries (UM). We have integrated this classification into the dataset: Higher Income countries = 1, Middle-Income countries = 2, Lower Middle-Income countries = 3, and Lower Income countries = 4.

Regarding the internet access rate, we got it from (World Bank and Database, 2021). These two variables constitute the external transaction variables since they can influence consumers' choice preferences, but they do not constitute choice criteria during the purchase. The dataset also includes each brand's market share and the total market share of the four brands across the 109 countries (BMshare). However, we did not incorporate the combined market share (CMshare) effect into the model. We utilized each brand's market share (BMshare) to control brands' popularity differences within countries. Since we have considered the purchased brands' market shares as the rate of purchases within countries, these market shares are those of 2021 and have been obtained from the website of Statcounter Globalstats (Statcounter, 2021). Besides, the dataset has data related to the product price (price), the logistics cost (logistics), and smartphone processing power (SMpp). We calculated the smartphone processing power (SMpp) from the mean of the ROM and RAM. We used the average value to characterize each smartphone's processing power. Table 1 shows the statistics of the dataset.

3.3. Hierarchical Regression Model

As the study's objective is to determine whether CLED influences IOCs' choice preferences for Chinese smartphones, we applied a hierarchical regression model. We assumed that the IOCs' choice preferences regarding Chinese smartphone

Table 1. Summarized statistics.

Variables and Definitions	Mean	Std. Dev.	Min	Max
Income level	1.964	0.496	1	4
Internet access rate (Internet)	76.606	8.561	4.71	99.65
Combined of the market shares of the four brands (CMshare)	1.214	0.588	0.05	10.15
Brand market share in the country (BMshare)	0.9	1.401	0	34.29
Smartphone processing power (SMpp)	19.296	10.665	9	67
Product price	172.185	90.106	115.71	611.4
Logistics Costs	4.435	10.708	0	91.85
Categories	Huawei	Xiaomi	Vivo	Oppo
Cat1	3GB32GB	-	-	-
Cat2	4GB32GB	-	-	-
Cat3	4GB64GB	-	-	-
Cat4	4GB128GB	-	-	-
Cat5	6GB64GB	-	-	-
Cat6	6GB128GB	-	-	-
Cat7	-	2GB16GB	-	-
Cat8	-	3GB32GB	-	-
Cat9	-	4GB64GB	-	-
Cat10	-	6GB64GB	-	-
Cat11	-	-	2GB16GB	-
Cat12	-	-	2GB32GB	-
Cat13	-	-	3GB32GB	-
Cat14	-	-	4GB64GB	-
Cat15	-	-	-	3GB32GB
Cat16	-	-	-	4GB64GB
Cat17	-	-	-	6GB64GB
Cat18	-	-	-	3GB32GB

brands are related to different groups of variables. The first group of variables is associated with the external transaction variables of buyers. That is to say, the socio-economic environments of the IOCs. These variables highlight the IOCs' countries' economic conditions. The second group of variables concerns internal transaction factors (price and logistics costs). We assumed that as consumers come from various socio-economic environments, their purchase behaviors and choice patterns for internal transaction variables will differ and reflect their socio-economic background. The third group is about the market conditions of each brand under study. That is to say, the popularity of each brand within the

countries involved in the transactions. Thus, to consider each brand's popularity, we incorporated into the model the market share of each brand within each country. These market shares are those of the year preceding the transactions analyzed in this study (2020-2021). We did so to control the difference in brand popularity. The last variable incorporated into the model is the smartphone processing power. We assumed that the consumer's economic environment influences smartphone processing power choices. Because if the consumer is living in a developed environment, they could spend more time on the internet on their smartphone.

As a result, the consumer might need a smartphone with higher processing power than consumers in underdeveloped countries. We evaluated IOCs' choice preferences for Chinese smartphone brands using these variables through six successive steps. We assumed that if an included variable influences consumers' preferences, we expect the R^2 to increase across the model. Thus, we analyzed not only the R^2 value but also the change from one model to another. In other words, after running the model, we observed the R^2 change (Table 4), which reflects the change in R^2 as a function of adding predictors. Essentially, we have six models that we can consider a nested model. The last model (model 6) is the main model, and models 1, 2, 3, 4, and 5 are nested within model 6.

4. Results and Discussion

We assumed that IOC's choice preferences of Chinese smartphones are related to 6 groups of variables. In Table 2, one observes that smartphone purchases follow almost the income level. The most significant purchases have been made in middle-income and higher-income countries, followed by lower-middle-income and lower-income countries. In Table 4, the R^2 value of model 1, with only the income level variable, accounts for approximately 0.9% in the variation of smartphone choice preferences instead of 0% when we have no predictors. When we look at the F test of model 1, one sees that the F test is deemed statistically significant (182.922; $p < 0.001$). Likewise, the coefficients related to the variable of income level are all significant across the six models.

Similarly, one observes from Table 3 a positive influence of income level on smartphone choice preferences (0.096; $p < 0.01$). Therefore, hypothesis 1 (H 1) is supported. In Table 4, the R^2 change of model 2, when adding the variable of internet access rate, is 0.1% in the variation of smartphone choice preferences. However, in Table 3, we see a negative correlation between the internet access rate and choice preferences of Chinese smartphone brands (-0.039; $p < 0.01$). These results show that although the variable of internet access rate influences consumers' smartphone choice preferences, that influence is negative. Therefore, hypothesis 2 (H 2) fails to be supported. After adding the price variable over the first two variables, we saw that the R^2 value (0.014) was higher compared to the R^2 value of the second model (0.011) with an R^2 change of 0.3% and an F test = 89.053. However, we got a negative and significant coefficient of price variation on smartphone purchases across almost all models except for model 5.

Table 2. Brands' SKUs purchases per market.

	Huawei						Xiaomi						Meizu			Coolpad			
	Cat1	Cat2	Cat3	Cat4	Cat5	Cat6	Cat7	Cat8	Cat9	Cat10	Cat11	Cat12	Cat13	Cat14	Cat15	Cat16	Cat17	Cat18	Total
H	196	59	27	41	60	118	363	1074	364	182	20	12	24	5	130	40	21	2	2738
L	2	0	0	0	0	2	1	3	3	4	0	0	0	0	10	0	0	0	25
LM	56	14	5	10	2	7	429	903	53	51	15	12	71	7	250	88	8	2	1983
UM	570	327	28	167	77	129	3188	5920	803	301	373	273	773	51	1020	672	72	3	14747

Note: Higher Income countries (H), Lower Income countries (L), Lower Middle-Income countries (LM), and Up Middle-Income countries (UM).

Table 3. Correlation.

	Income level	Internet	Price	Logistics	BMshare	Skupp	Choice preference
Income level	1	−0.682**	−0.180**	0.009	−0.078**	−0.136**	0.096**
Internet	−0.682**	1	0.025**	−0.259**	−0.054**	0.017*	−0.039**
Price	−0.180**	0.025**	1	0.133**	0.253**	0.787**	−0.075**
Logistics cost	0.009	−0.259**	0.133**	1	0.322**	0.123**	−0.158**
BMshare	−0.078**	−0.054**	0.253**	0.322**	1	0.208**	−0.552**
SMpp	−0.136**	0.017*	0.787**	0.123**	0.208**	1	0.123**
Choice preference	0.096**	−0.039**	−0.075**	−0.158**	−0.552**	0.123**	1

**Correlation is significant at the 0.01 level; *Correlation is significant at the 0.05 level.

Table 4. Hierarchical regression analysis.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Income level	0.658*** (0.049)	0.886*** (0.066)	0.767*** (0.068)	0.455*** (0.069)	0.216*** (0.056)	0.168*** (0.054)
Internet		0.0194*** (0.004)	0.015*** (0.004)	−0.012** (0.004)	−0.02*** (0.003)	−0.022*** (0.054)
Price			−0.2*** (2.95)	−16.371*** (2.929)	30.753*** (2.526)	−125.05*** (3.688)
Logistics cost				−51.294*** (2.379)	0.917 (2.089)	−2.212 (1.946)
Bshare					−1.382*** (0.015)	−1.388*** (0.014)
SMpp						0.156*** (0.00284)
cons	7.346*** (0.098)	5.413*** (0.396)	6.358*** (0.414)	9.333*** (0.432)	10.405*** (0.365)	10.536*** (0.339)
R^2	0.009	0.011	0.014	0.037	0.315	0.407
R^2 change		0.001	0.003	0.023	0.278	0.092
F	182.922***	104.279***	89.053***	184.644***	1791.633***	2224.461***
F change		25.407***	57.99***	465.056***	7919.485***	3006.828***

Note: Standard errors in parentheses. **$p < 0.01$, ***$p < 0.001$.

Similarly, Table 3 shows a significant and negative correlation between price and smartphone choice preferences (−0.075; $p < 0.01$). Accordingly, hypothesis 3 (H 3) fails to be supported. Similarly, with the fourth model, after adding the variable of the logistics cost over the previous variables, we saw from Table 4 that the R^2 value (0.037) was higher compared to the R^2 value of model 3 (0.014) with an R^2 change of 2.3%. Nevertheless, we also got negative and significant coefficients of logistics cost on smartphone purchases through models 4 and 6. Through Table 3, we see a negative impact of the logistics cost variable on smartphone choice preferences (−0.158; $p < 0.01$). Accordingly, hypothesis 4 (H 4) is not supported.

In the next model, after adding the control variable to the previous variables, we can see that it is also statistically significant ($R^2 = 0.315$), one of the highest of all of the models and an R^2 change of the highest of the models (27.8%). However, the market share variable presents negative and significant coefficients on smartphone choice preferences (−1.382; $p < 0.01$ in model 5, and −1.388; $p < 0.01$ in model 6). Likewise, in Table 3, that variable shows a negative and significant effect on smartphone choice preferences (−0.552; $p < 0.01$). Therefore, hypothesis (H 5) is not supported.

The purchases we are analyzing are online purchases; therefore, the negative effect of the variable of market shares could be understood in this way. When brands are popular (high market share) in the local markets (countries), consumers prefer to buy product brands in the local markets directly instead of buying online. With the last model (model 6), adding the factor of the smartphone processing power (SMpp), we observe that the R^2 value (0.407) was higher compared to that of models 1, 2, 3, 4, and 5, with an R^2 change statistically significant and one of the highest of all of the models (9.2%). This result shows that the processing power factor substantially and significantly impacts Chinese smartphone choice preferences. The coefficient associated with the processing power (0.156; $p < 0.01$) is also positively significant. Likewise, Table 3 shows that the processing power positively and significantly affects smartphone choice preferences (0.096; $p < 0.01$). Therefore, hypothesis 6 (H 6) is supported.

In Table 4, we can see that the variable of smartphone processing power accounts for approximately 9.2% of the smartphone choice preferences alone, compared to 0.9% and 1.1% for income level and the Internet access rate. Therefore, smartphone processing power more robustly affects consumers' choice preferences than income level and the Internet access rate. Hence, hypothesis 7 (H 7) is supported.

In Table 4 through model 2, one observes that variables of income level and the Internet access rate together account for approximately 0.1% of the variation of smartphone choice preferences compared to models 3, 4, 5, and 6, which represent, respectively, 0.3%; 2.3%; 27.8%, and 9.20% of the variation of smartphone choice preferences. Hence, hypothesis 8 (H 8) fails to be supported.

5. Conclusion and Limitation

Since the advent of international e-commerce, consumers are more and more

purchasing various product brands labelled "*Made in China*" through the CIOS framework. That is the case with Chinese smartphones. Unfortunately, e-sellers, which act as intermediaries between those Chinese product brands and international customers, do not factor the economic contexts of the IOCs into their marketing plans. However, our results proved that countries' income levels influence consumer preferences for Chinese smartphone brands. As a result, Chinese smartphone brands and e-retailers need to match their managerial strategies to international customers' economic environments. Globally speaking, our discoveries could help Chinese smartphone products become more widespread worldwide. Thus, accounting for CLEDs' factors in consumers' choice preferences of Chinese smartphone brands gives a new understanding of consumers' preferences.

Nevertheless, this study has certain limitations despite its contributions to CIOS literature. The limitations of this study concern the nature of the data. The data is secondary data. We collected the data from only one single CIOS platform. Future study might be done by gathering data from other or different international selling platforms in China or elsewhere. Alternately, it would be better to conduct the study utilizing primary data.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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