

The Commercialization of Cultural Heritage: Consumer Preferences and Innovation in the Transformation of Zibo Glass Art

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Abstract. The commercialization of intangible cultural heritage plays an important role in balancing cultural preservation with sustainable economic development. This study investigates consumer preferences for Zibo glass art, a representative Chinese traditional craft, and identifies the key factors influencing consumers' willingness to pay and product choices. A discrete choice framework is developed to examine how cultural attributes, product characteristics, and price jointly shape purchasing decisions. Primary survey data were collected from 153 respondents and analyzed using correlation analysis, ordinary least squares (OLS), binary logistic regression, and multinomial logit models. The empirical results indicate that consumers who place greater value on cultural heritage and traditional craftsmanship exhibit a significantly higher willingness to pay and are more likely to choose handmade glass products over mass-produced alternatives.

Keywords: Zibo Glass Art, Intangible Cultural Heritage, Consumer Preferences, Willingness to Pay, Cultural Commercialization

1. Introduction

Traditional handicrafts play an important role in modern economies: they function simultaneously as utilitarian products and as carriers of cultural meaning, identity and heritage. As global markets expand and creative industries develop, traditional crafts are increasingly incorporated into commercial channels through branding, design innovation, and cultural storytelling [1].

Zibo glass art, originating in Boshan District of Shandong Province, represents a particularly compelling case of this transformation. With a history tracing back to the Yuan Dynasty (1271–1368), Boshan colored glass craftsmanship evolved through family-based artisanal production and developed into a distinctive regional artistic tradition [2]. Despite its artistic and cultural value, Zibo glass art faces substantial commercialization challenges. The production is highly dependent on manual labor, requiring a considerable amount of time investment for each piece [3]. This results in high production costs, making it difficult to scale the production of handmade glass art in competitive markets.

Addressing these questions requires a deeper understanding of consumer behavior towards Zibo glass art. The commercialization of heritage goods depends on whether consumers are willing to pay

for attributes such as cultural symbolism, handcrafted production and artistic innovation. Previous studies also suggest that the combination of functional value and artistic aesthetics is an important source of consumer appreciation for traditional glass art [4].

To formally analyze this trade-off, this paper develops a discrete choice framework that models consumer demand for Zibo glass products. A total of 153 valid responses were collected. The survey records respondents' demographic characteristics, prior purchasing experience, familiarity with Zibo glass art, and preferences for cultural heritage, storytelling, traditional design, and price. Correlation analysis, OLS regression, logistic regression, and multinomial logit models are then used to examine determinants of willingness to pay and product choice. The results show that stronger cultural preferences increase consumers' willingness to pay, which in turn raises the likelihood of choosing handmade Zibo glass products.

This study contributes to the literature on cultural economics and creative industries in three ways. First, it extends research on the commercialization of cultural heritage by examining how consumers value cultural attributes in purchasing decisions. Second, it applies a discrete choice framework to analyze the trade-off between cultural value and price in the context of traditional handicrafts.

2. Framework

The commercialization of Zibo glass art can be understood as a problem of vertical differentiation under price competition. However, handmade production implies higher marginal costs and therefore higher prices. The success of commercialization depends on whether consumers' valuation of authenticity and cultural meaning compensates for the price premium required by handcrafted production. Consumer demand is modeled in a differentiated product setting where consumers choose between a handmade heritage product, a mass-produced substitute and an outside option.

2.1. Consumer choice

Denoting each consumer i selects one alternative from the finite set J :

$$J = \{0, Z, M\}$$

Where 0 denotes the outside option where no purchase from consumer; Z denotes handmade Zibo glass; M denotes the mass-produced glass substitute.

Consumer i maximizes utility:

$$j_i^* = \operatorname{argmax}_{j \in J} U_{ij}$$

The outside option is normalized as $U_{i0} = 0$.

2.2. Utility specification

Utility is given by:

$$U_{ij} = V_{ij} + \epsilon_{ij}$$

Where ϵ_{ij} represents unobserved idiosyncratic preferences which follows T1EV distribution. The deterministic component is specified as:

$$V_{ij} = \beta_a a_j + \beta_c c_j + \beta_d d_j - \beta_p p_j + \theta^T x_j$$

Where p_j represents price; a_j denotes the authenticity and handcrafted intensity; c_j represents cultural and heritage symbolism; d_j innovation and modern design; x_j other observable product characteristics

2.3. Choice probabilities

Assume ϵ_{ij} are i.i.d. Type I extreme value. The implied multinomial logit choice probabilities are:

$$P_{ij} = \frac{\exp(V_{ij})}{\sum \exp(V_{ik})}$$

An increase in any attribute that raises V_{ij} increases the probability that alternative j is chosen, holding other alternatives fixed.

2.4. Willingness to pay

Willingness to pay (WTP) for a given attribute is derived from the marginal rate of substitution between that attribute and price.

Holding utility constant:

$$dV_{ij} = \beta_k dx_{kj} - \beta_p dp_j = 0$$

Thus, the marginal WTP for authenticity is:

$$WTP_a = \frac{\beta_a}{\beta_p}$$

These quantities measure the price premium consumers are willing to pay for different attributes.

2.5. The commercialization condition

To understand when handmade Zibo glass is preferred to mass produced substitutes, consider the deterministic utility difference:

$$\Delta V_i = V_{iZ} - V_{iM}$$

Substituting the utility specification:

$$\Delta V_i = \beta_a(a_Z - a_M) + \beta_c(c_Z - c_M) + \beta_d(d_Z - d_M) - \beta_p(p_Z - p_M) + \theta^T(x_Z - x_M)$$

Which implies that handmade Zibo glass is preferred when:

$$\beta_a \Delta a + \beta_c \Delta c + \beta_d \Delta d + \theta^T \Delta x \geq \beta_p \Delta p$$

This inequality summarizes the economic trade off: the utility gain from authenticity and cultural differentiation must exceed the utility loss from the price premium.

3. Methodology

This study employs a survey-based empirical approach to examine consumer preferences for Zibo glass art and to evaluate how cultural attributes and price considerations jointly influence purchasing decisions. The data are collected through an online questionnaire administered via Wenjuanxing, a widely used survey platform in China. A total of 153 valid responses are obtained and used in the analysis.

The empirical analysis is conducted using the individual level survey responses. Correlation analysis is conducted to examine the relationships among key variables and to provide descriptive evidence on how cultural preferences relate to purchasing decisions. T-tests are used to compare mean differences across groups, such as respondents who are familiar with Zibo glass art versus those who are not. ANOVA is implemented to evaluate whether preferences and purchasing behavior differ across age groups, income levels and education categories. These tests provide insights into how awareness and experience are related with consumer preferences and demographic.

Several regression models are estimated to formally analyze the determinants of consumer behavior. An ordinary least squares (OLS) model is used to examine the factors influencing consumers' willingness to pay for Zibo glass products. A binary logistic regression model is employed to identify the determinants of consumers' willingness to pay a price premium for handmade products. A multinomial logit model is estimated to analyze consumers' choices between handmade and machine-made glass products, while an additional binary logit model examines the factors affecting the likelihood of choosing handmade Zibo glass products.

Together, these empirical methods provide a comprehensive analysis of consumer preferences and purchasing behavior, allowing the study to examine the importance of cultural attributes and price in the commercialization of Zibo glass art.

4. Result

Table 1. Correlation matrix of key variables

	(1) Handmade Pref	(2) Heritage	(3) Story	(4) Traditional	(5) WTP	(6) Price Sens	(7) Budget	(8) Choose A
(1) Handmade Pref	1.000	0.569***	0.533***	0.509***	0.462***	0.299***	0.087	0.186**
(2) Heritage		1.000	0.799***	0.571***	0.607***	0.409***	0.074	0.250***
(3) Story			1.000	0.712***	0.617***	0.415***	0.125	0.253***
(4) Traditional				1.000	0.585***	0.488***	0.161*	0.255***
(5) WTP					1.000	0.490***	0.150	0.271***
(6) Price Sens						1.000	-0.095	-0.048
(7) Budget							1.000	0.349***
(8) Choose A								1.000

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 1 presents the correlation matrix of key variables. Several important patterns emerge.

First, cultural preference variables, including preference for handmade products, perceived cultural heritage, product storytelling and preference for traditional design, are all positively and strongly correlated with each other. In particular, the correlation between heritage and storytelling is especially high (0.799, $p < 0.01$), indicating that consumers tend to perceive cultural meaning and narrative content as closely linked attributes.

Second, these cultural attributes are significantly associated with willingness to pay (WTP). The correlations range from 0.462 to 0.617 which are all significant at 1% level. There is a positive correlation between storytelling and willingness to pay (0.617, $p < 0.01$). From this, storytelling enhances value perceptions and willingness to pay premiums for products.

Table 2. OLS regression: willingness to pay

Variable	Coef.	Std.Err.	z	P> z	[0.025	0.975]
Heritage attractiveness	0.286	0.131	2.182	0.029	0.029	0.543
Care about story	0.174	0.152	1.146	0.252	-0.124	0.471
Traditional design	0.244	0.111	2.188	0.029	0.025	0.462
Handmade preference	0.020	0.084	0.237	0.813	-0.145	0.184

Table 2. (continued)

Price sensitivity	0.161	0.075	2.157	0.031	0.015	0.307
Heard Zibo glass	0.079	0.134	0.591	0.555	-0.183	0.341
Bought handicrafts	-0.145	0.233	-0.625	0.532	-0.601	0.311
Income (high)	0.643	0.246	2.613	0.009	0.161	1.125

Table 2 reports the results of the OLS regression, where willingness to pay is regressed on cultural attributes, price sensitivity and control variables. The results show that heritage attractiveness (coefficient = 0.286, $p < 0.05$) and preference for traditional design (coefficient = 0.244, $p < 0.05$) are both positive and statistically significant predictors of willingness to pay. This suggests that cultural differentiation increases the perceived value of heritage products. The coefficient in price sensitivity is also positive and significant.

Among the control variables, high-income respondents exhibit significantly higher willingness to pay (coefficient = 0.643, $p < 0.01$), indicating that financial resources influence the upper bound of valuation. In contrast, respondents with lower income generally exhibit lower willingness to pay, reflecting the influence of financial constraints on consumer valuation.

Table 3. Logistic regression: paying premium

Variable	Coef.	Std.Err.	z	P> z	[0.025	0.975]
Intercept	-4.846	1.784	-2.716	0.007	-8.343	-1.349
WTP	0.797	0.348	2.289	0.022	0.115	1.478
Price sensitivity	-0.772	0.282	-2.735	0.006	-1.325	-0.219
Budget	0.927	0.265	3.494	0.000	0.407	1.447
Heritage	0.291	0.410	0.710	0.478	-0.513	1.095
Story	0.490	0.407	1.203	0.229	-0.308	1.287

Table 3 presents the results of the logistic regression model, where the dependent variable indicates whether a respondent is willing to pay a premium for handmade products. The results show that WTP (coefficient = 0.797, $p < 0.05$) significantly increases the probability of choosing a premium option. Consumers with higher willingness to pay are more likely to accept the premium price of handmade products. In contrast, higher price sensitivity (coefficient = -0.772, $p < 0.05$) significantly reduces the likelihood of paying a premium because these consumers place greater importance on affordability than on cultural attributes.

Most notably, budget has a large and highly significant positive effect (coefficient= 0.927, $p < 0.01$), indicating that financial capacity plays a critical role in enabling premium purchases.

Table 4. Multinomial logit: choice of product B vs A

Variable	Coef.	Std.Err.	z	P> z	[0.025	0.975]
Price sensitivity	1.173	0.520	2.255	0.024	0.153	2.193
Budget	-0.959	0.436	-2.201	0.028	-1.813	-0.105
WTP	-0.886	0.504	-1.759	0.079	-1.874	0.101
Heritage	-1.091	0.632	-1.726	0.084	-2.330	0.148

Table 5. Logit model: choosing handmade product

Variable	Coef.	Std.Err.	z	P> z	[0.025	0.975]
Heritage orientation	0.967	0.345	2.803	0.005	0.291	1.643
Budget	1.158	0.342	3.390	0.001	0.488	1.827
Price sensitivity	-0.418	0.495	-0.846	0.398	-1.388	0.551

Table 4 reports the results of the multinomial logit model comparing the choice of the machine-made product (Product B) relative to the handmade product (Product A). The results indicate that price sensitivity significantly increases the likelihood of choosing machine made alternative (coefficient = 1.173, $p < 0.05$), while budget significantly reduces it (coefficient = -0.959, $p < 0.05$). Cultural variables such as heritage have negative coefficients, indicating that stronger cultural preferences reduce the likelihood of choosing machine made options.

Table 5 presents the results of the binary logit model for choosing the handmade product. The results show that heritage orientation has a strong and statistically significant positive effect (coefficient = 0.967, $p < 0.01$), indicating that consumers who place greater value on cultural heritage and traditional craftsmanship are significantly more likely to choose the handmade product.

5. Managerial implications

The empirical findings of this study provide several important implications for the commercialization and market positioning of Zibo glass art.

First, the results show that cultural attributes increase consumers' willingness to pay, which in turn raises the likelihood of purchasing handmade Zibo glass products. By helping consumers better understand the cultural meaning behind each product, firms can increase its perceived value and justify premium prices.

Second, the results show that consumer awareness and prior purchasing experience play an important role in shaping preferences. Consumers who are familiar with Zibo glass art or have previously purchased handicrafts are more likely to recognize its cultural value and show higher willingness to pay. As more people become familiar with Zibo glass art, consumer interest and purchase intention are likely to increase, creating a stronger market for traditional handmade products.

Third, although cultural preferences are relatively similar across different demographic groups, budget constraints remain an important factor affecting actual purchasing decisions. Producers should adopt a tiered pricing strategy by offering products at different price levels. This approach can expand the customer base without reducing the value of high-quality handmade products.

6. Conclusion

This paper examines how consumer preferences influence the commercialization of Zibo glass art. Data collected from 153 questionnaire responses are analyzed using correlation analysis, OLS regression, logistic regression, and multinomial logit models to examine determinants of willingness to pay and product choice.

The empirical results show that cultural heritage, traditional craftsmanship, and product storytelling have a positive effect on consumers' willingness to pay.

Based on these findings, the paper suggests that the commercialization of Zibo glass art should focus on strengthening its cultural identity instead of relying mainly on price competition.

Overall, this study shows that cultural value can improve consumers' willingness to pay and increase the competitiveness of traditional handicrafts. By combining cultural preservation with product innovation and effective commercialization strategies, Zibo glass art can achieve sustainable development while maintaining its unique cultural heritage [5].

References

- [1] Liu, H., Alli, H., & Yusoff, I. S. M. (2024). The impact of user preference and perceived value on customer satisfaction and marketability at traditional handicraft product. *Cogent Business & Management*, 11(1), 2327476.
- [2] UNESCO. (2013). Creative economy report.
- [3] Wang, Y., Li, J., & Chen, H. (2019). Traditional glass craftsmanship and regional culture in China.
- [4] Li, X., Sun, Y., & Gao, R. (2020). Functional aesthetics in traditional Chinese glass art. *Design and Culture*, 12(3), 311–325.
- [5] Chen, L., Huang, Z., & Wu, T. (2021). Innovation and sustainability in traditional Chinese handicrafts.