

ARE THE RICH WILLING TO PAY MORE FOR BEAUTIFUL CITIES? INCOME EFFECTS ON THE WILLINGNESS TO PAY FOR AESTHETIC IMPROVEMENTS

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ABSTRACT: This study used the contingent valuation method to measure the amount that Metro Manila households are willing to pay (WTP) for an improvement in urban aesthetic values through the removal of billboards. A household survey was conducted to elicit WTP using the single-bound binary choice format. A measure of income elasticity was used to determine the effects of income on WTP, testing a hypothesis that higher income increases willingness to pay for urban aesthetic improvements. Results of the logistic regressions showed that income is a statistically significant determinant of WTP. Estimates of mean WTP ranged from PHP1,276 (USD29) to PHP1,416 (USD32), while income elasticity was estimated at 1.02 and 1.19, indicating that WTP for urban aesthetic improvements increases more than proportionally as income rises. This implies that programs aimed at improving city aesthetics are valued more by high-income households than low-income households.

1. INTRODUCTION

Signs, billboards, and other forms of outdoor advertising are now ubiquitous in most urban centres across the country. Traffic safety and public health issues have been raised by some policymakers but one particular issue often overlooked is the effect of unrestrained outdoor advertising on the urban environment and roadside aesthetics. The uncontrolled proliferation of billboards and signage creates visual clutter and contributes to urban blight. When outdoor advertising is improperly placed, made too large and too many, it can infringe on natural, scenic, historic, and aesthetic values of the urban landscape (Pennsylvania Resources Council, 2003). Many towns and cities in developed countries have adopted local measures to mitigate such “visual pollution”. However, this has not been the case in most developing countries, where worrying about visual clutter and adopting programs aimed at enhancing the urban landscape in general is often deemed too costly and uneconomical. Although on a priori grounds there is no reason to believe that environmental quality is a luxury good, many have argued that concern for the environment is essentially a pursuit of the privileged (Kristom and Riera, 1996).

This study uses the contingent valuation (CV) method to estimate household valuation of aesthetic improvements in the urban landscape and examines the role of income, among other determinants, in the willingness to pay for such improvements. It answers the research question: does higher income increase willingness to pay for improved urban aesthetic values? Income elasticity of WTP is estimated to determine whether willingness to pay for improved

aesthetic values through the removal of billboards increases more than proportionally with income.

A household survey is conducted to elicit WTP values using the referendum-style binary format developed by Hanemann (1984). Two logit model specifications are used to estimate values of WTP and income elasticity. The findings are particularly interesting for its developing country context to determine whether Metro Manila residents are willing to sacrifice some disposable income for better urban aesthetics and whether income plays a significant role in people's willingness to pay for a more visually-appealing urban environment. Findings also have implications on the Environmental Kuznets Curve hypothesis of a U-shaped relationship between output growth and environmental degradation. Finally, a measure of the income elasticity of WTP quantifies the distributional pattern of WTP, indicating whether the rich or poor households benefit more from such program.

2. REVIEW OF RELEVANT LITERATURE AND EXPERIENCE

The visual characteristics of a community are said to create a sense of place and civic pride, defining the unique aesthetics that identify the community and its members. When outdoor advertising is poorly managed, the visual clutter can compromise the aesthetic appeal of the urban landscape, contributing to urban blight and decay. Billboards, along with overhead power lines, telephone poles, haze and smog are common examples of visual pollution – a general term used to describe unattractive visual elements that intrude on aesthetically-pleasing scenery or impair one's ability to view distant objects or vistas. Although visual pollution is often studied with reference to rural landscapes (Szoegé et al, 2005 and Groothuis et al, 2006), much public attention has been drawn in recent years towards the urban landscape as well. In the U.S., the states of Vermont, Maine, Hawaii and Alaska have banned billboards for the sake of preserving the aesthetic appeal of their natural landscapes in particular but about 1,500 towns and cities have also done the same to eliminate visual clutter in the urban setting. The Norwegian city of Bergen prohibits billboards and many other towns and cities such as Moscow, Auckland, and São Paulo have placed or are planning to place severe restrictions on outdoor advertising (Pennsylvania Resources Council, 2003).

Alongside the aesthetic issues surrounding the proliferation of billboards, concerns have also been raised regarding the effects of billboards on local businesses, traffic flow, and public safety. Unappealing sign clutter can damage the visual appeal of businesses sharing the same location and may make it difficult for smaller businesses to be seen when their signage is overshadowed by larger billboards and other off-premise advertising. With regards to road traffic safety, visual clutter can serve as a distraction for motorists and can contribute to traffic accidents. Finally, damaged billboards and signage can be hazardous particularly during typhoons and strong rains. For instance, during a typhoon that hit Metro Manila in September 2006, a total of 22 billboards were toppled by strong winds according to the Metro Manila Development Authority (MMDA)

The MMDA and the Department of Public Works and Highways (DPWH) have been particularly worried about the traffic safety and public health hazards that billboards pose to motorists, commuters, and roadside residents. However, due to the absence of an explicit legal framework, these agencies have been unable to closely regulate the placement of outdoor advertising. The Outdoor Advertising Association of the Philippines (OAAP) lists more than 8,000 billboards in Metro Manila in 2004. Most billboards are concentrated along major thoroughfares like EDSA and C-5, but secondary roads have not been spared from other forms of advertising like tarpaulin banners.

In 2006, the Philippine Senate passed an act “regulating the placement of billboard signs”, also known the “Anti-Billboard Blight Act” prohibiting billboards that (1) obstruct the view of vehicular or pedestrian traffic in such a manner as to endanger their movement, (2) impair scenic vistas from the highway, and (3) obstruct windows and doorways of adjacent buildings. Unfortunately, the bill was not prioritized by the House of Representatives and ultimately failed to pass Congress.

It has long been argued that environmental quality is a luxury good, with an income elasticity of demand greater than one (Kristom and Riera, 1996). In general, beautification programs and similar projects that focus primarily on aesthetic and “quality of life” values may tend to be less prioritized in developing countries because of their low levels of income. The lack of enthusiasm on the part of Congress to act on the 2006 anti-billboard bill may be a case in point. It is often thought that matters such as eradicating poverty, building infrastructure, and fighting crime deserve more government attention than taking down billboards to improve the urban landscape.

In his review of early literature on the relationship between income and environmental quality, Pearce (1980) shows that the consensus among economists was that concern for environmental quality is essentially a pursuit of the privileged class and that the environment is a luxury good. Boercherding and Deaton (1974) is one of earlier work on the topic that suggests that the income elasticity of public goods is greater than one. Their study of the demand for non-federal government services including police, fire protection, and parks/recreation reveals income elasticities greater than unity in three out of four cases. Demand for parks/recreation particularly, which is closest to the subject of urban aesthetics, exhibited income elasticity greater than one. In a parallel study, Bergstrom and Goodman (1973) obtained similar results. More recent work such as Pereyra and Rossi (1991), Miles et al (2002), and Ghalwash (2006) also suggest that the environment is a luxury good.

Studies by Grossman and Kreuger (1991) and the World Bank (1992) have popularized a hypothesized relationship between various indicators of environmental degradation and income per capita that resembles the pattern of inequality and income first described by Kuznets (1955). The idea behind the so-called environmental Kuznets Curve (EKC) is that at low-income levels, degradation and pollution are seen to increase but beyond some income threshold level, the trend reverses so that at high-income levels pollution and degradation decreases with economic growth (Stern, 2003). In his review of past empirical

studies, Barbier (1997) shows that as per capita incomes increase, demand for environmental quality increases, and claims that a very high income per capita is needed before environmental quality begins to increase, implying that most countries have yet to reach the turning point.

3. FRAMEWORK

The EKC relationship can be traced to three aspects of economic activity affected by income growth: scale of production, product composition, and production technology. If there is no change in structure or product composition, economic growth increases the scale of output along with the level of pollution. Under this assumption of a balanced growth path for the economy, pollution per unit of output stays constant, and thus total pollution rises as output increases. This is known as the scale effect. On the other hand, when income growth is accompanied by a change in preferences and thus the composition of goods produced, then pollution may increase or decrease depending on whether more or less pollution-intensive goods are produced. Finally, if richer countries can afford less-polluting production technologies, and environmental quality is at least a normal good, then growth can lead to less pollution and less degradation (Stern, 2003).

Grossman's (1995) decomposition of income effects on pollution and environmental degradation shows it is possible for pollution to decrease as incomes rise through structural or technological changes. Differentiating total emissions with respect to time and dividing the derivatives by E_t leads to Grossman's income-effects decomposition equation:

$$\dot{E}/E = Y/Y + \sum_j e_j S_j/S_j + \sum e I_j/I_j \quad (1)$$

The first term on the right-hand side shows the scale effects of higher income, the second term reflects structural effects or changes in product composition, and the third term represents change in production technology. Higher income leads to a larger scale of production and thus leads to more pollution. On the other hand, changes in the kinds of goods and services produced may lead to more or less pollution, depending on what particular goods/services are demanded following the change in income. Finally, changes in income may lead to changes in production technology, which may also increase or decrease pollution. This framework suggests that as income rises, changes in demand for particular goods such as environmental quality may lead to changes in product composition and technology, leading to reduced environmental degradation.

If environmental quality is a luxury good then demand for it will rise more than proportionally as income increases. As demand for environmental quality increases more than proportionally with income while demand for other goods increase less than proportionally, the structural change in product composition away from "dirty" goods towards cleaner, less-polluting output may more than offset the scale effect of rising income. The decrease in pollution at a specific income threshold is precisely what the environmental Kuznets curve (EKC)

suggests. In his review of the EKC, Lieb (2003) postulates that higher income generates greater demand for environmental quality, causing the turning point at the peak of the EKC.

To test for the effects of income on WTP for improved environmental quality, which in this study takes the specific form of improved urban aesthetics, Jacobsen and Hanley's (2008) measure of the income elasticity of WTP is used. WTP is estimated using the contingent valuation method or CVM for a program aimed at removing billboards in Metro Manila.

Following Kristöm and Riera (1997), let consumer utility $u(z, q)$ be a function of the state of the environment z and composite good q . The consumer maximizes his utility subject to a budget constraint $y = pq$ where the price of q is normalized to one. Solving for the consumer's indirect utility function yields $V(z, y)$. Letting z^i ($i=0,1$) be the state of the environment in i , and using the indirect utility function, WTP can be defined as:

$$V(z^1, y - wtp) = V(z^0, y) \quad (2)$$

Willingness to pay for an improvement in state of the environment from z^0 to z^1 thus corresponds to the compensating variation that will make a consumer as well-off with the new state of the environment and the new income as with the old state of the environment and the old income.

Under the framework of the random utility theory (McFadden, 1974), indirect utility can be written as:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad (3)$$

The utility that person i derives from choosing alternative j is written as U_{ij} , where V_{ij} is the deterministic component of utility and ε_{ij} is a stochastic element that represents unobservable influences on consumer choice.

In the binary choice format of the CVM, two alternatives are presented to the consumer, an improved state j and the status quo k . Following Hanemann (1984), the probability that a consumer prefers option j or k is:

$$P_{ij} = P(\varepsilon_{ij} - \varepsilon_{ik} < V_{ik} - V_{ij}) \quad (4)$$

$$P_{ik} = P(\varepsilon_{ik} - \varepsilon_{ij} < V_{ij} - V_{ik})$$

Assuming that each random term is Type I extreme value distributed, the probability of the consumer choosing alternative j is:

$$P_{ij} = 1/(1+e^{-\omega(V_{ik} - V_{ij})}) \quad (5)$$

This can be estimated using Hanemann's binary logit model where ω is normalized to one.

4. METHODOLOGY

To test for the effects of income on WTP for improved environmental quality, which in this study takes the specific form of improved urban aesthetics, Jacobsen and Hanley's (2008) measure of the income elasticity of WTP is used. WTP is estimated using the contingent valuation method or CVM for a program aimed at removing billboards in Metro Manila.

Contingent valuation is an approach to the valuation of non-marketed goods (i.e. goods and services not traded in markets) that uses surveys to elicit willingness-to-pay for positive changes in the environment or willingness-to-accept negative changes. A CV survey presents scenarios that offer different possible future government actions, and asks respondents to state their preferences among those actions. The choices made by survey respondents among the hypothetical scenarios are then analyzed in the same way as the choices made by consumers in actual markets (Carson, 1999).

There are a number of issues surrounding the use of CV methodology in general. These issues concern (1) the hypothetical nature of the CV question; (2) potential bias generated by "strategic" responses; and (3) the possible biases generated by design flaws in the survey instrument. The hypothetical nature of the CV question has long been a major focus of debates on the reliability of CV methodology. How a respondent answers a hypothetical CV question might not accurately reflect his true response faced with the real situation. For instance, respondents may answer CV questions with a "warm-glow" by which they get moral satisfaction from the act of paying for the good/service regardless of the characteristics of the actual environmental good, which means that they were being motivated by the utility derived from the mere act of "doing charity" or "doing the right thing" and not by the utility they expect to derive from the environmental good being presented.

Another problematic type of response is that which is strategic. Strategic responses to the CV question may be in the form of "nay-saying" or "yea-saying". Nay-saying occurs when the respondent provides a no response to an amount asked even though WTP is greater than the amount proposed. Saying "no" may be a strategic response so that should the alternative policy or non-status quo condition be implemented, the respondent would not have to pay the full amount he/she is truly willing to pay. Yea-saying occurs when a respondent says yes to an amount in order to please the interviewer even though the respondent's WTP is less than the amount proposed.

There are also issues regarding the choice of format for the CV question. One of the earliest formats is the open-ended protocol used by Davis (1963) where the respondents is simply asked how much he is willing to pay for the alternative scenario to be implemented. The problem with the open-ended format was that it was subject to unrealistic bids that became outliers, making analysis and value estimation more difficult, if not questionable. The most commonly used format of the CV approach offers the survey respondent a binary choice between the status quo and an alternative policy scenario that costs more than maintaining the status quo. The respondent is told that the government will impose the higher

cost if the alternative scenario is implemented. A willingness-to-pay (WTP) question is asked and the respondent provides a “favor/not-in-favor” response. Developed by Hanemann (1984), this so-called referendum format offers each respondent a single bid price, but offers different bids to different respondents, and then from this, traces out the distribution of WTP. An advantage of the referendum format is that responses are bound by the researcher’s questions, allowing him to exclude unrealistic bids (Kimenju et al, 2005).

Finally, the double-bounded CV format introduced by Carson, Hanemann et al (1986) is an improvement of the referendum format that is said to be more statistically efficient (Hanemann, Loomis et al, 1991). Here the respondent is offered a second bid, higher or lower depending on whether the first bid was accepted or not. A drawback of the double-bounded format is that responses to the first and second choice question may not be perfectly correlated and also, it may suffer from starting point biases (Lusk and Hudson 2004).

Due to its relative simplicity and widespread use in the literature, the single-bound referendum-style binary choice format developed by Hanemann (1984) is used in this study. This close-ended question format is chosen over an open-ended question that simply asks for the respondent’s maximum willingness to pay because, as mentioned earlier, open-ended questions can be problematic when the good in question is a public good (Whittington, 2002). Respondents may feel that it is not fair for them to give their maximum WTP if others do not have to pay the same amount to benefit from the good.

In this study, the status quo is the current level of visual pollution characterized by the proliferation of billboards in Metro Manila, while the alternative is a billboard-free environment through the adoption of the proposed program at a cost to households. The respondent is asked whether he is in favor or not of a government program aimed at removing billboards to improve the quality of the roadside environment at the cost of a one-time payment, A , collected on top of their real estate tax this year. Each respondent is presented a single bid price A in pesos, but five different bids (PHP100, PHP500, PHP1,000, PHP2,000 and PHP3,500) are offered to different respondents. The distribution of WTP is traced out by randomly assigning bid prices to respondents. The actual CV question can be found in Appendix A.

Two specifications are adopted using Hanemann’s (1984) binary logit model. Model1 estimates the probability of a “yes” response as a function of the bid price A and income only:

$$\text{Pr(Yes)} = 1/(1+\exp[\beta_0 + \beta_1 A + \beta_2 \text{income}]) \quad (6)$$

Model2 estimates the probability of a “yes” response as a function of the bid price, income, education, whether the respondent notices billboards, whether he finds them useful in deciding where to shop or what to buy, and whether he finds them harmful to city views:

$$\Pr(\text{Yes}) = 1/(1+\exp[\beta_0 + \beta_1 A + \beta_2 \text{income} + \beta_3 \text{education} + \beta_4 \text{notice} + \beta_5 \text{useful} + \beta_6 \text{harmful}]) \quad (7)$$

The probability of a “yes” response is expected to be positively related to income. Higher income should generate greater demand for environmental quality (Lieb, 2003) if the environment is a normal good. β_2 is therefore expected to have a positive sign. Meanwhile, β_1 should be negative since a higher bid price A should lead to a lower probability of a “yes” response if environmental quality is an ordinary good. In Model2, education is expected to have a positive effect on the probability as environmental awareness grows with higher levels of education (Selden and Song, 1994). β_3 should therefore be positive. A respondent who takes notice of billboards may be more concerned about their proliferation. A respondent who finds the information provided by billboards useful may not be willing to pay to have them removed, while a respondent who finds billboards harmful to city and roadside views may be eager to have them dismantled.

Mean willingness to pay is calculated according to the equation:

$$\text{WTP} = -\alpha/\beta_1 \quad (8)$$

where α is the sum of the constant term and the coefficients of all explanatory variables except price multiplied by their respective mean values and β_1 is the coefficient of the bid price A .

To measure income effects, income elasticity of willingness to pay ε_w is calculated using Jacobsen and Hanley’s (2008) formula where:

$$\varepsilon_w = (y/\text{WTP})(\partial W/\partial y) = \partial(\ln W)/\partial(\ln y) \quad (9)$$

In this equation, y is income and W is the estimated “bid function” for WTP. Flores and Carson (1997) show that income elasticity of willingness to pay may diverge from income elasticity of demand. However, without a better alternative measure, income elasticity of WTP has been used as a proxy for income elasticity of demand in many studies including Kristom and Riera (1996) and Pereyra and Rossi (1999).

At the same time, ε_w also quantifies the distribution pattern of WTP, such that when $\varepsilon_w < 1$, the environmental good is said to be distributed regressively, when $\varepsilon_w > 1$, the good is distributed progressively. The traditional hypothesis is that at the same time as being a luxury good, environmental quality is also an “elitist good” so that improvements in such quality benefit the rich more than the poor (McFadden, 1994). This would be the case if $\varepsilon_w > 1$. On the contrary, if $\varepsilon_w < 1$ then programs which improve the quality of the environment have the possibility of benefiting poorer households more than richer households, in the sense that the proportion of WTP to income is decreasing as incomes rise. This information can be particularly useful for policymakers interested in the distributional effects of such programs.

5. SURVEY DESIGN AND SAMPLING PROCEDURE

Primary data on WTP was gathered through self-administered surveys distributed using a drop-off protocol and a systematic random sampling technique in August 2009. The household survey was conducted in Metro Manila, the national capital region of the Philippines. The sample was drawn from two residential barangays in Quezon City and the City of Marikina. Quezon City is the largest city in Metro Manila both by area and population size. The City of Marikina on the other hand, is a mid-sized city at the eastern portion of Metro Manila. Both cities have direct linkages to major thoroughfares such as EDSA, C-5 Road and Aurora Boulevard where billboards have proliferated. Barangay Mariana in Quezon City has a population of 11,079 residents and 2,053 households. Households in the district range from low to high income. Barangay Jesus de la Peña in Marikina has a population of 13,183 residents and 2,001 households, most of which belong to the middle-income bracket.

Systematic random sampling was used to select respondents. Using maps of the chosen barangays, starting points were identified, from which questionnaires were dropped-off every 5th house thereafter. Recipients were asked to let their household head accomplish the survey form. A total of 154 questionnaires were distributed of which 80 fully-accomplished forms were successfully retrieved (52% response rate). Twenty-two fully-accomplished forms were collected from barangay Mariana, 58 forms were collected from barangay Jesus de la Peña. An equal number of subsamples were taken for each of the five bid levels.

The survey instrument was designed to reduce the biases associated with CV studies discussed earlier. Incorporated into the questionnaire was a “cheap talk” script in which hypothetical bias was explicitly discussed with respondents prior to asking the WTP question. Cummings and Taylor (1999) provide evidence of the effectiveness of this approach in reducing hypothetical bias.

The survey instrument includes (1) an introductory section to help set the general context of the study, (2) awareness and attitudinal questions on the current proliferation of billboards in Metro Manila, (3) a description of the status quo and the alternative CV scenario offered to the respondent, including the manner in which the good will be paid for, (4) the actual CV question, (5) a set of debriefing questions about why respondents answered certain questions the way they did, and (6) a final section that asks for socio-economic information.

Prior to conducting the actual survey, a draft questionnaire was presented to two focus-group discussions (FGD) with representatives of the target population. Some of the points discussed were the acceptable range of bids that were to be used to elicit WTP, their concerns and attitudes towards billboards, and the proposed program for the removal of billboards. Secondary data was collected from the National Statistics Office (NSO), the Metro Manila Development Authority (MMDA) and the Department of Public Works and Highways (DPWH).

6. ANALYSIS OF RESULTS

The following sections discuss the results of the empirical analysis. In the first section, a summary of survey responses and respondents' demographics are presented. This is followed by a presentation of regression results and the estimated values of mean WTP and income elasticity. In the last section, the policy implications of the study's findings are discussed.

6.1 Survey Responses and Demographics

A total of 80 household surveys were used in the final sample. The mean age of respondents is 45. Nearly an equal number of male and female household heads participated in the survey. On average, respondents were college graduates and earned an average monthly income of PHP41,781. Meanwhile, the average monthly household income in Metro Manila is P22,877 (NSO, 2004). This suggests that the sample may be biased towards higher income households. Table 1 summarizes respondents' demographics. Separate demographics for the two survey sites are available in Appendix D.

Table 1. Survey Respondents' Demographics

	Mean	Standard Deviation
Age	44.88	10.42
Sex (male = 1)	0.45	0.05
Education	13.93	1.95
Household size	4.50	1.71
Number of Dependents	1.81	1.50
Monthly Income	41,781.25	27,516.38

There are a total 41 (51.25%) positive responses to the CV question. Twenty-nine (70%) of yes responses were made by respondents that were assigned the two lowest bid values (P100 and P500). As expected, fewer positive responses were obtained from respondents that were assigned higher bid values. Only one (1.25%) positive response was obtained from respondents that were assigned the highest bid value (P3,500), suggesting that the maximum bid value assigned is sufficiently high as an upper-bound WTP value.

The attitudes and opinions of respondents regarding billboards and urban aesthetics were elicited in the survey as well. Respondents were asked to state whether they strongly agreed, agreed, neither agreed nor disagreed (neutral), disagreed, or strongly disagreed with several statements following a Likert scale. Table 2 presents a summary of survey responses.

Most respondents agree (53.75%) or strongly agree (38.75%) that they notice billboards along Metro Manila roads. Only 36% of respondents agree or strongly agree that billboards provide useful information, and only 30% agree or

strongly agree that billboards help in making decisions on what to buy or where to shop. These values are lower than what Groothuis et al (2006) obtained (46% and 42% respectively for the two statements) in the survey they conducted in a U.S. county in the Appalachian Mountains. About 74% agree or strongly agree that billboards are harmful to city views. Only 3.75% disagree with the statement and none strongly disagree. The majority of respondents (75%) also agree or strongly agree that the uncontrolled proliferation of billboards is a problem. Finally, 87% agree or strongly agree that the urban aesthetic or visual appeal of Metro Manila is in need of improvement.

Table 2. Attitudes of Respondents

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I notice billboards and signage placed along roads in Metro Manila.	38.75%	53.75%	6.25%	1.25%	0.00%
2. Billboards provide useful information.	3.75%	32.50%	38.75%	20.00%	5.00%
3. Billboards are useful in helping me make decisions on what to buy or where to shop.	7.50%	22.50%	35.00%	23.75%	11.25%
4. Billboards are harmful to city views because they obstruct vistas and create visual clutter.	31.25%	42.50%	22.50%	3.75%	0.00%
5. The uncontrolled proliferation of billboards in Metro Manila is a problem.	26.25%	48.75%	21.25%	3.75%	0.00%
6. The urban aesthetic, visual appeal or beauty of Metro Manila is in need of Improvement	47.50%	40.00%	12.50%	0.00%	0.00%

6.2 Regression Results

Generally, when analysing the results of logit models only the signs of the estimated coefficients are interpreted since the interpretation of their specific magnitudes can be problematic. Table 3 summarizes the results of the logistic regression of the two models discussed in the previous section.

Results of both Model1 and Model2 show the coefficients of income and bid level to be statistically significant at the 95% confidence interval, and their signs are as expected. In both models, the positive sign of the income coefficient suggests that higher income leads to a greater likelihood of a yes response to the CV question, while the negative sign of the bid value coefficient suggests that payment size negatively affects the likelihood of an “in favor” response to the proposed program. The statistically significant positive value of the income coefficient in both models confirms the hypothesis that higher income increases the willingness to pay for improved aesthetic values.

In Model2, contrary to expectations, the coefficient of education is found to be not statistically significant at any acceptable level of significance ($\geq 90\%$). The sign is also unexpected. It may be that when it comes to valuing urban aesthetics and the beauty of one’s surroundings, one does not need higher education or better “environmental awareness” as proposed by Selden and Song

(1994) to realize the benefits of a more aesthetically pleasing urban environment, unlike for example the case of valuing the benefits of clean air where perceived benefits may be influenced by a better understanding of the health impacts of pollution or the harmful effects of emissions on the environment. It may also be that the role of formal education in building environmental awareness may have eroded as other media (print and TV media, the internet, etc.) have emerged as sources of information. It must be noted however that in Groothuis et al (2006), education was found to be a significant determinant of the WTP for the removal of billboards in North Carolina.

Table 3. Regression Output

	Model1		Model2	
	Coefficient	P> z	Coefficient	P> z
bid	-0.002567	0.000	-0.003049	0.018
income	0.000089	0.000	0.000111	0.034
education			-0.308463	0.348
notice			1.660394	0.091
useful			-1.618514	0.098
harmful			2.059361	0.083
_cons	-0.071631	0.908	-0.819245	0.865
Log likelihood		-26.2107		-9.3327
Number of obs		80		80
Pseudo R2		0.5273		0.8317

The coefficients of all attitudinal factors included in the model were found to be statistically significant at acceptable levels of significance ($\geq 90\%$). Those who said that they notice billboards along Metro Manila roads were more likely to be in favor of the proposal for the removal of such billboards. On the other hand, as expected those who said that billboards are useful in helping them make decisions on what to buy or where to shop were less likely to respond positively to the CV question. Also as expected, those who agreed that “billboards are harmful to city views because they obstruct vistas and create visual clutter” were more likely to be in favor of the proposed program aimed at removing them. Similar results were obtained by Groothuis et al in their study.

6.3 Mean WTP and Income Elasticity

Table 4 shows the values of mean WTP and income elasticity of WTP obtained from the two models. The mean WTP obtained from Model1 is PHP1,416 (US\$28.32). Mean WTP from Model2 is PHP1,276 (US\$25.52). Groothuis et al obtained a WTP estimate of US\$48 (PHP2,400) in their U.S. study.

Income elasticity of WTP (ϵ_w) derived from both models are both greater than unity, suggesting that an improvement in urban aesthetic values is a luxury good – that is if income elasticity of WTP is to be accepted as a proxy for income elasticity of demand. This result supports the traditional consensus

(Boercherding and Deaton, 1974; Pearce, 1980; Pereyra and Rossi, 1991, Ghalwash, 2006) that environmental quality is a luxury good. The result therefore also supports that EKC hypothesis that predicts environmental degradation and pollution should decrease beyond a certain threshold level of income. If environmental quality and enhanced urban aesthetic values are luxury goods then demand for it increases more than proportionally as incomes rise, while demand for non-luxury goods increase less than proportionally to income. This leads to a change in the composition of economic output towards less-polluting production. The result further supports the hypothesis that higher income increases WTP for improved urban aesthetics. The fact that ϵ_w is greater than one means that as income rises, WTP increases more than proportionally.

Table 4. Mean WTP and Income Elasticity

	Model1	Model2
Mean WTP	PHP1,416	PHP1,276
Income Elasticity (ϵ_w)	1.02	1.19

As in Jacobsen and Hanley (2008), income elasticity of WTP can also be interpreted in terms of welfare distribution. Since ϵ_w is greater than one, an improvement in urban aesthetic values through the removal of billboards may be expected to benefit the rich more than the poor – i.e. benefits are progressively distributed. Results show that higher-income households have relatively higher WTP than lower-income households, suggesting that the rich value the benefits of aesthetic improvements more than the poor. This is in contrast to the findings of Kristöm and Riera (1997) in their study using data from a number of European CV studies where they found income elasticity to be greater than zero but less than unity, which implies that environmental improvements are valued more by the poor more than the rich. It is important to note, however, that none of the studies used by Kristöm and Riera focused on urban aesthetic improvements. It may be that unlike improvements in water quality, agricultural management practices, and natural parks – which were the focus of the European studies used by Kristöm and Riera – city beautification is relatively more “pro-rich” than “pro-poor”.

6.4 Policy Implications

The results of the study have implications on the economic benefits of both a program aimed at removing billboards in particular and city beautification programs in general. Policymakers in developing countries often overlook the matter of urban aesthetics. In general, when it comes to environmental policy, the usual argument is that priority must be on development first, environment second. The results of this study show that there is in fact a sizeable economic value attached by households to aesthetics. Survey results reveal that majority of participant households (75%) believe that the uncontrolled proliferation of billboards is a problem. An even greater majority (87%) believe that the urban

aesthetics of Metro Manila is in need of improvement. These results show that residents want a more aesthetically-pleasing environment. The results also show that they are in fact willing to pay for it.

Estimates of WTP reveal the monetary value that households put on their perceived benefits from the proposed program. The results of the study show that households place this value at PHP1,276 to PHP1,416. These values are equal to about 3 percent of the average monthly income of respondents.

Results also show that the benefits of beautifying surroundings by removing visual clutter are felt more by the rich than by the poor since higher-income households tend to value city aesthetics more than lower-income households. A developing-country government with limited resources may thus find it more attractive to spend on programs other than city beautification that are valued by the poor more than the rich. It is therefore not surprising why programs aimed at improving aesthetic values are often least prioritized by governments.

Nevertheless, following the EKC framework, as incomes rise, it may be that once incomes reach a threshold level, demand for improved urban aesthetics would increase by a substantial amount relative to demand for other goods, thereby changing the product composition of the economy towards more aesthetically-pleasing environments. Results of the study confirm the hypothesis that higher income increases WTP for improved urban aesthetics. It can thus be expected that as incomes rise, the greater demand for aesthetic values may eventually result in more beautiful surrounding as the economy reaches higher levels of prosperity.

7. CONCLUSION AND RECOMMENDATIONS

Following a theoretical framework based on Grossman's (1995) decomposition of income effects on pollution and using the contingent valuation (CV) method to estimate the willingness to pay of households in Metro Manila for improvement in urban aesthetic values through the removal of billboards, this study tests the hypothesis that higher income increases the willingness to pay for improved urban aesthetics. Two specifications are used to model the probability of a yes response to the CV or WTP question. In Model1, the probability of a yes response is regressed on bid price and income only. In Model2, the probability is regressed on bid price, income, education, and a host of attitudinal factors such as whether the respondent believes that billboards are harmful to city views. Following the regressions, mean WTP is estimated and a measure of income elasticity of WTP borrowed from Jacobsen and Hanley (2008) is used to determine income effects on WTP and welfare distribution.

The results of both models indicate that bid price and income are statistically significant in determining the probability of a yes response. On the other hand, Model2 shows that education is not significant, while all attitudinal factors included are found to be significant. A respondent is more likely to answer yes to the CV question and be willing to pay for the proposed program if he notices billboards and if he agrees that they are harmful to city views. He is less likely to answer yes if he finds billboards useful in making shopping decisions.

Mean WTP is estimated at PHP1,276 and PHP1,416 in Model1 and Model2

respectively. Income Elasticity of WTP is estimated at 1.02 and 1.19, indicating that WTP increases more than proportionally to increases in income. The distributional implication of these results is that programs aimed at improving urban aesthetic values such as the one proposed in the study are felt more by the more than the poor since higher-income households value the proposed improvement in environmental quality more than lower-income households.

Further research on the valuation of urban aesthetics is recommended. For one, the study focuses on Metro Manila only but billboards and other forms of off-premise outdoor advertising have also proliferated outside Metro Manila, obstructing urban views in other cities such as Cebu and Davao, as well as natural scenic vistas in rural areas. Further research could expand the scope of the study to include other regions or to determine WTP for aesthetic improvements on a national level.

Also, the study has a number of limitations that future research can work on. One major limitation is the small sample size used in the survey. A much larger sample size of at least 250 households may increase the reliability of WTP estimates. With regards to survey design, a certainty rating may be used alongside a cheap talk script to further reduce hypothetical bias. In this scheme, respondents are asked to rate how sure they are about their response to the WTP question. Responses may then be calibrated so that only those who expressed a specific level of certainty would be counted as “yes” votes.

On the other hand, strategic bias associated with yea-saying behaviour may also be reduced by using alternative survey strategies such as a mail/drop-off protocol, self-administered questionnaires or secret ballots instead of the face-to-face interview format used in this study. With regards to handling protest bids, future work may use a spike model (Kristom, 1997) to accommodate zero willingness to pay in model estimation, in contrast to this study’s assumption that willingness to pay is positive for all respondents, regardless of their responses to the CV question.

Also, regarding the use of a surcharge on top of the annual real estate tax as payment vehicle in the CV scenario, future work may find other payment vehicles that would allow non-real estate property owners to contribute to the program. Finally, future work can also investigate the interaction of demographics and socio-economic indicators with attitudes and opinions towards billboards and urban aesthetics in general.

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APPENDIX A: CV QUESTION

Five different bid levels were used for different respondents. The following bid levels were randomly assigned to respondents: P100 (US\$2), P500 (US\$10), P1000 (US\$20) P2000 (US\$40) and P3500 (US\$70). The respondent is asked the following CV question:

The MMDA and the Department of Public Works and Highways (DPWH) have been pushing for the removal of billboards and other forms of outdoor advertising along Metro Manila roads. However, property owners contend that they must be compensated for any loss of income. Suppose the government adopts a program to remove these billboards to improve the quality of the roadside environment. The program is mandated to pay landowners to compensate for the loss of income from the removal of billboards from their property. Suppose that to implement this program, households like yours must make a single contribution of P_____ on top of your real estate tax this year. Are you in favor of this proposal?

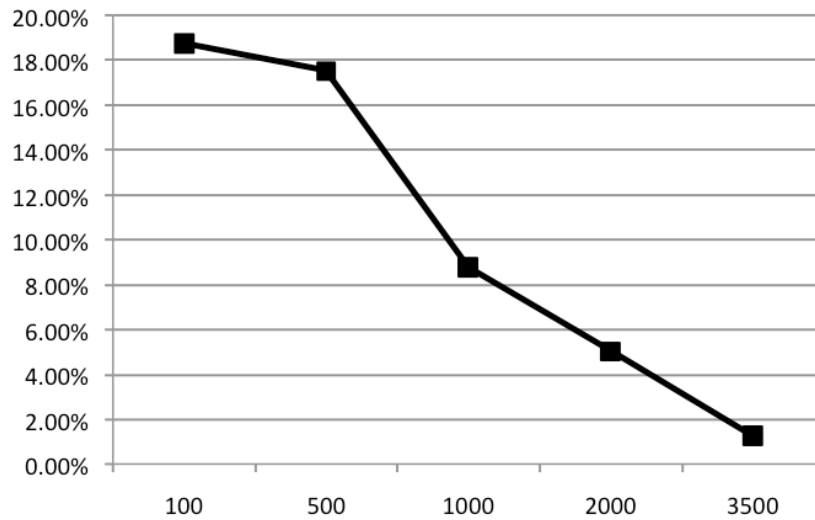
APPENDIX B: FULL REGRESSION OUTPUT

Model 1

Logistic regression		Number of obs	80	
		LR chi2(2)	58.48	
		Prob > chi2	0.0000	
Log likelihood =	-35.829802	Pseudo R2	0.5273	
	Coefficient	Std. Error	z-statistic	P> z
bid	-0.002567	0.000633	-4.06	0.000
income	0.000089	0.000024	3.65	0.000
_cons	-0.071631	0.617812	-0.12	0.908

Model 2

Logistic regression		Number of obs	80	
		LR chi2(2)	92.24	
		Prob > chi2	0.0000	
Log likelihood =	-9.3326879	Pseudo R2	0.8317	
	Coefficient	Std. Error	z-statistic	P> z
bid	-0.003049	0.012931	-2.36	0.018
income	0.000111	0.0000522	2.12	0.034
educ	-0.308463	0.326975	-0.94	0.348
notice	1.660394	0.981709	1.69	0.091
useful	-1.618514	0.971864	-1.65	0.098
harmful	2.059361	1.188555	1.73	0.083
_cons	-0.819245	4.818194	-0.17	0.865

APPENDIX C: DISTRIBUTION OF YES RESPONSES**APPENDIX D: SURVEY RESPONDENT'S DEMOGRAPHICS PER SITE**

	Barangay Mariana			Barangay Jesus de la Pena		
	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median
Age	46.95	8.56	48.00	44.08		47.00
Sex (male = 1)	0.54	0.51	1	0.41	0.49	0
Education	14.81	1.46	14.00	13.59	2.01	14.00
Household size	4.54	1.77	5.00	4.48	1.71	5.00
Monthly Income	70,000.00	25,401.54	65,000.00	31,077.59	19,691.21	25,000.00