

Consumer Willingness to Pay Price Premium for Certified Wood Products in South Korea

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Abstract : The study was conducted to examine consumers' awareness and perceptions on forest certification and their willingness to buy and pay price premium for certified wood products especially for selected four wood products. A total of 136 residents in Seoul and Gyeonggi Province were interviewed in the autumn of 2008. Although only 24.3 percent of the consumers are aware of forest certification, 82.4 percent of the respondents recognized the need and significance of forest certification. In general, 77.2 percent of the respondents were willing to buy certified wood products. Majority of the respondents, 84 out of 136 respondents (61.8%) expressed their willingness to pay (WTP) from more than 0 percent to less than 10 percent. Consumers' average WTP for certified wood products was estimated to be 5.6 percent. From the results of the study, lower priced wood products, such as copier paper (WTP=9.8%) and wood frame (WTP=11.6%), have higher price premiums than high priced products, such as wood table (WTP=6.8%) and wood flooring (WTP=7.6%). In conclusion, there could be feasible markets for certified wood products in South Korea as four out of five consumer are willing to pay more for such products. For the forest certification system to be adopted and widely accepted, the perceptions of forest stakeholders including consumers should be further increased.

Key words : certified wood products, consumers, forest certification, price premium, sustainable forest management, WTP

Introduction

With the growing concern for the global environmental issues, 'eco-labeling'; a process which proves the environmental profile of goods and services has emerged (Perera and Vlosky, 2006). Eco-labeling for environmental stewardship is becoming increasingly popular because it can ensure and improve better environmental and marketing incentives (Aguilar and Vlosky, 2007). Forest certification system such as Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC), has emerged to address the deforestation of tropical forests in the early 1990s.

Forest certification is a process of issuing written certificate by an independent third party which assures the quality of a forest which is managed in an economically, environmentally, and socially sustainable way (Baharuddin and Simula, 1994). Forest certification has been promoted as a market based incentive for forest management improvement (Upton and Bass, 1995). Carter and Merry

(1998) mentioned that although U.S. producers are increasingly interested in participating in the certification system, they thought that the uncertain cost of certification could be compensated by consumers' extra payment for certified wood products.

There are two leading international forest certification systems, namely the FSC and the PEFC. Until now, 102.5 million *ha* of 940 forests in 81 countries and 190.9 million *ha* of forests in 19 countries have been certified by FSC and PEFC, respectively (FSC, 2009; PEFC, 2009). As chain-of-custody (CoC) certification, 10,613 certificates in 88 countries by FSC and 4,420 certificates in 41 countries by PEFC were certified as of 2008 (FSC, 2009; PEFC, 2009). Among the PEFC certified forests, around 10 million *ha* of U.S. forests by ATFS (American Tree Farm System), 20 million *ha* of U.S. forests by SFI (Sustainable Forestry Initiative), and 360 million *ha* of Canadian forests by SFI (Sustainable Forestry Initiative) were included by mutual recognition (endorsement) certification.

South Korea has 6.38 million *ha* of forest covering about 64.0 percent of the total land area in 2007 (KFS, 2008). Growing stock is 624.4 million m³ and the grow-

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ing stock per *ha* is 97.8 m³/ha which has increased greatly from 9.6 m³/ha in 1960 due to successful national scale rehabilitation project (Youn *et al.*, 2004). South Korea, as a member country of Montreal Process which aims to promote sustainable forest management of non-European boreal and temperate forests, should manage its forest land and forest resources in an economically, environmentally, and socially sustainable way. However, forest area has been decreased annually due to increased demand for other land uses, such as land for houses, road, and factory, but the growing stock per *ha* and the condition of forest health have improved because of conservation and sustainable forest management.

Forest certification was introduced and discussed since mid-1990s in South Korea (Joo and Lee, 2000). An experimental forest in Jeju Island, managed by Warm-temperate Forest Research Center of Korea Forest Research Institute, was first certified by FSC in 2006, and a national forest in Hongcheon-gun was certified also by FSC in the same year. South Korea has now six certified forests of 129,719 *ha* by FSC as of September 2008 (FSC, 2009). As for FSC CoC certification, 21 certificates have been achieved by Korean companies, such as paper and wood product manufacturers. The certified forest area and number of CoC certificate by FSC are increasing, but until now, there is no other certificate achieved by other forest certification system except for one CoC certificate by PEFC in South Korea.

The objectives of this study were: 1) to examine the consumers' perceptions on forest certification, 2) to examine the consumers' willingness to pay for certified wood products, including selected four wood products, and 3) to identify demographic factors of consumers related to the willingness to pay for certified wood products.

Willingness to pay (WTP) refers to the maximum amount of money that an individual would pay to obtain goods or services, including environmental goods. Contingent valuation is a method which can be used to know the willingness of consumers for some characteristics of the environment by simply asking them (Field, 1994). Consumers' stated preference for certified products is estimated by using contingent valuation (CV) method. The level of WTP is a method often used to compare consumers' preference for certified wood products by respondent characteristics. Conjoint analysis, a tool to determine consumer's choice among combinations of product features, is another useful method for estimating consumers' potential demand for market products (Veisten, 2007).

According to several consumer studies, consumers generally stated preference for certified wood products and willingness to pay more for them over uncertified

general products (Ozanne and Vlosky, 1997; Aguilar and Vlosky, 2007; Veisten, 2007). In South Korea, a couple of studies have been conducted about stakeholders' perceptions on forest certification. Joo and Lee (2000) studied the willingness to pay for certified wood products of various forest certification stakeholders, including forest owners, wood merchants, general consumers, construction companies, and wood manufacturers. Cha (2003) studied forest stakeholders' perceptions on forest certification and willingness to pay for certified wood products. In the study, WTP of consumers, wood products manufacturers, and forest owners were examined and compared. Lee *et al.* (2007a) compared the perceptions and willingness to pay for certified wood products between consumers and product manufacturers. In the results of the survey of 198 interviewees in Seoul, Pusan, and Daegu, 123 respondents (62%) expressed their interest to participate in the certification system and expressed their willingness to pay premium for certified wood products as follows: WTP of less than 5% over the price of a product without certification (33% of the respondents), WTP of 6-10% (45%), WTP of 11-20% (16%), and WTP of more than 21% (6%).

Materials and Methods

1. Sampling and questionnaire design

A questionnaire was composed of the following: 1) awareness and perceptions on forest certification, 2) willingness to buy and pay for certified wood products and the level of WTP, 3) willingness to pay price premium for selected certified wooden products, and 4) demographic, social, and economic profile.

The data were collected in the autumn of 2008 in South Korea. Questionnaires were gathered from six regions: four in Seoul and two in Gyeonggi Province. The selection of study area was referred to the results of the previous consumer studies (Aguilar and Vlosky, 2007; Ozanne and Vlosky, 1997) that WTP and income were highly related. Gangnam-gu and Songpa-gu of Seoul and Gwacheon-si in Gyeonggi Province were selected as relatively high income areas, and Gangseo-gu and Gwanak-gu of Seoul and Anyang-si in Gyeonggi Province were selected as relatively low income areas (Bong and Lee, 2006). The survey was administered by two trained students at Seoul National University. A total of 136 respondents were included for the analysis. The survey was conducted in a non-probabilistic way, that is, a quota sampling was used for this study. Consumers were randomly sampled based on the criteria of balance in gender and age groups, not every *n*th customer of each discount department store selected from the surveyed regions.

2. Research methodology

In the first part of the questionnaire, consumers were asked about their awareness of forest certification. After that, a brief definition of the forest certification was explained to the interviewees. Their attitude toward the significance of forest certification was also evaluated using 5-point Likert-type scales.

To know the consumers' willingness to pay more for certified wood products, ordered responses model was used for coding respondent preferences (Harrison and McLennon, 2004). Premium intervals in percentage scale were chosen as comparable to the previous studies on WTP for environmentally certified wood products, such as Lee *et al.* (2007a) and Cha (2003). Then, the level of WTP was coded as 0=0%, 1=less than 5%, 2=5-10%, 3=10-15%, 4=15-20%, and 5=more than 20%.

The average level of WTP according to respondents' personal profile, such as sex, age, marriage, education, occupation, and income, was compared using statistical method of t-test and ANOVA (analysis of variance).

To investigate the consumers' practical willingness to pay for some wood products, four consumer-friendly wood products with different characteristics and prices, which can be bought in discount department stores, were selected. The products and suggested base prices for certification premium comparisons are as follows: one bundle of copier paper (5,000 Won), wood frame (5,000 Won), wood dining table (500,000 Won), and 33 m² of wood flooring (1,000,000 Won). Respondents were asked on how much they will pay more for each item of certified wood products which originated from sustainably managed forests. Example pictures and base prices were provided with an open ended question about WTP of the consumers.

This is referred to as "stated preference" method, which is processed by asking the people directly in a survey on how much money they can pay for specific environmental services. The contingent valuation (CV) method was used in this study to estimate the consumers' willingness to pay for environmental values, including forest certification. In this survey and analysis, open-ended CV was applied. Extra willingness to pay for certified wood products versus uncertified wood products were gathered directly from the interviewees.

Results and Discussion

1. Respondents profile

Of the total 136 consumers included in the analysis, female (51.5%) slightly outnumbered male (48.5%). The age group distribution and proportion of the sample are as follows: 20s (16.9%), 30s (32.4%), 40s (19.8%), 50s (22.8%), and >60s (8.1%). Married respondents (74.3%)

were more than single respondents (25.7%). Education was categorized into four groups and 42.6 percent of the respondents were able to obtain college graduate. Respondents' occupation was categorized into seven groups: self employed, blue collar, white collar, professional, housewife, student, and unemployed *etc.* Income level was categorized into five groups depending on the amount of household's monthly income: less than 2 million Won (US\$1,540, exchange rate of US\$ 1=1,300 Won was applied for calculation), 2-3 million Won (US\$ 1,540-US\$ 2,310), 3-4 million Won (US\$ 2,310-US\$ 3,080), 4-5 million Won (US\$ 3,080-US\$ 3,850), and more than 5 million Won (US\$ 3,850). Respondents' demographic profile is described in Table 1.

2. Awareness and perceptions on forest certification

Of the total 136 consumers analyzed, only 11 (8.1%) knew forest certification while 22 respondents (16.2%) have heard of forest certification. The majority of 103 (75.7%) consumers did not know forest certification. The proportion of consumers who are aware (knew or have heard of) of forest certification was 24.3 percent and this is somewhat increased figure as compared to the previous studies with 21.5% in 2003 (Cha, 2003) and

Table 1. Demographic characteristics of the respondents.

	Variables	Number of samples	Frequency (%)
Gender	Male	66	48.5
	Female	70	51.5
Age (years)	20s	23	16.9
	30s	44	32.4
	40s	27	19.8
	50s	31	22.8
	60s -	11	8.1
Marriage	Single	35	25.7
	Married	101	74.3
Education	- High school	31	22.8
	Some college	27	19.9
	College graduate	58	42.6
	Graduate school	20	14.7
Occupation	Self employed	17	12.5
	Blue collar	9	6.6
	White collar	27	19.9
	Professionals	33	24.3
	Housewife	31	22.8
	Student	9	6.6
	Unemployed <i>etc.</i>	10	7.3
Income (/Month)	< 2 million Won	28	20.6
	2 - 3 million Won	36	26.5
	3 - 4 million Won	14	10.3
	4 - 5 million Won	27	19.8
	> 5 million Won	31	22.8
	Total	136	100

14% in 2005 (Lee *et al.*, 2007a).

A brief explanation of forest certification, "Forest certification is a system which ensures sustainable and sound management of domestic or global forest certified by individual third party and the system plays an intermediate role of connecting producers and consumers of such environmentally friendly wood products" was given to the interviewees. Thirty three (24.3%) of the 136 respondents expressed their attitude to the significance of forest certification to be 'very affirmative', and 79 (58.1%) to be 'affirmative', while 19 (14.0%) thought 'neither affirmative nor negative' and 5 (3.7%) thought 'negative'. Nobody expressed their attitude to forest certification to be 'very negative'. A total of 82.4 percent of the respondents thought that forest certification is significant ('very affirmative' and 'affirmative'). This figure falls between the findings of Cha (2003), in which the figure was 90.3 percent and Lee *et al.* (2007b), in which the figure was 74 percent of the consumers, implying that forest certification system should be activated in South Korea.

Although it has been three years since the introduction and adoption of forest certification in South Korea, the awareness of forest certification still remained to be low (3 out of 4 consumers do not know forest certification at

all). Non-establishment of markets for certified wood products and the manufacturers' low participation and interest in the system are the main causes of consumers' low awareness of forest certification (Lee *et al.*, 2007a). Because wood manufacturers, even those who treat certified wood products, do not use certification as a marketing strategy, it becomes difficult for the consumers to find certification logo, such as FSC logo. Another reason for consumers' low awareness of forest certification is the emergence of lots of labeling in the market especially for agricultural food products. Consumers become confused in discerning various types of labeling and so they do not rely on the use of logo.

3. Willingness to buy and willingness to pay for certified wood products

Respondents were asked whether they will buy certified wood products, such as furniture, flooring, and papers, if these products are distinguished and can be bought in the market. Of the 136 consumers analyzed, 105 (77.2%) respondents expressed their willingness to buy certified products. Only 2 respondents (1.5%) expressed their unwillingness to buy. Other 29 respondents (21.3%) reserved their decision of buying the certified products by choosing 'don't know' option. Of the 70 female and

Table 2. Consumers' willingness to buy certified wood products.

	Variables	Will buy (%)	Will not buy	Don't know	Number of respondents
Gender	Male	48 (72.7)	1	17	66
	Female	57 (81.4)	1	12	70
Age (years)	20s	17 (73.9)	1	5	23
	30s	34 (77.3)	0	10	44
	40s	22 (81.5)	0	5	27
	50s	23 (74.2)	1	7	31
	60s -	9 (81.8)	0	2	11
Marriage	Single	30 (85.7)	1	4	35
	Married	75 (74.3)	1	25	101
Education	- High school	19 (61.3)	1	11	31
	Some college	22 (81.5)	0	5	27
	College graduate	48 (82.8)	1	9	58
	Graduate school	16 (80.0)	0	4	20
Occupation	Self employed	12 (70.6)	1	4	17
	Blue collar	8 (88.9)	0	1	9
	White collar	20 (74.1)	0	7	27
	Professionals	28 (84.8)	1	4	33
	Housewife	22 (71.0)	0	9	31
	Student	8 (88.9)	0	1	9
	Unemployed <i>etc.</i>	7 (70.0)	0	3	10
Income (Month)	< 2 million Won	17 (60.7)	1	10	28
	2 - 3 million Won	29 (80.6)	0	7	36
	3 - 4 million Won	10 (71.4)	0	4	14
	4 - 5 million Won	23 (85.2)	0	4	27
	> 5 million Won	26 (83.9)	1	4	31
Total (%)		105 (77.2)	2 (1.5)	29 (21.3)	136 (100)

66 male respondents, 57 (81.4%) and 48 (72.7%), expressed their willingness to buy certified wood products, respectively. This is congruent with other research results that female consumers have more preference for environmental products than male consumers (Laroche *et al.*, 2001; Mohamed and Ibrahim, 2007) (see Table 2).

To know the level of willingness to pay for certified wood products, consumers were asked on how much money they will pay more for the certified wood products. Six WTP options were provided: 1) 0%, 2) less than 5%, 3) 5-10%, 4) 10-15%, 5) 15-20%, and 6) more than 20%. Twenty eight consumers (20.6%) said that they will not pay extra money for certified wood products regardless of whether they are willing to buy them. Nearly 80 percent (79.4%) of the respondents (108 consumers) expressed their willingness to pay more for certified wood products.

The distribution of 136 consumers' level of WTP is described in Figure 1. The number of respondents with their corresponding level of WTP are the following: 1) WTP 0% : 28 (20.6%), 2) WTP less than 5% : 44 (32.4%), 3) WTP 5-10% : 40 (29.4%), 4) WTP 10-15% : 15 (11.0%), 5) WTP 15-20% : 9 (6.6%), and 6) WTP more than 20% : 0 (0%). Majority of the respondents (about 62%) choose 'WTP less than 5%' or 'WTP 5-10%' (0% < WTP < 10%).

For calculation of a median WTP in percentage term, the mid-point value of each WTP range, such as 0%, 2.5%, 7.5%, 12.5%, and 17.5% was applied to each respondent's WTP. The sample average WTP for general certified wood products of the consumers was calculated arithmetically with weight and was 5.6 percent.

4. Willingness to pay according to consumers demographic characteristics

To compare respondents' level of WTP according to consumers characteristics, ordered responses model was

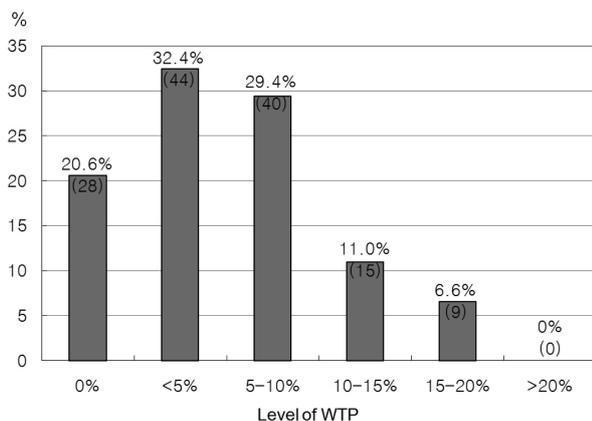


Figure 1. Consumers' level of willingness to pay for certified wood products.

used (Harrison and Mclennon, 2004). Consumers' level of WTP were coded as 0=0% WTP, 1=WTP less than 5%, 2=WTP 5-10%, 3=WTP 10-15%, 4=WTP 15-20%, and 5=WTP more than 20%. The mean level of WTP of each respondent's demographic group was calculated using the following equation (1).

$$WTP_{ij} = \frac{\sum_{k=0}^5 k \cdot n_{ijk}}{n_{ij}} \quad (1)$$

Wherein, n_{ijk} is the number of respondents in the group j in demographic variable i (gender, age, *etc.*) at WTP level k . WTP level k includes 0 (WTP=0%), 1 (WTP<5%), 2 (WTP 5-10%), 3 (WTP 10-15%), 4 (WTP 15-20%), and 5 (WTP >20%).

First, the average level of WTP of the total 136 consumers was estimated to be 1.51 points, which means the average willingness to pay for certified wood products is located between 1 (WTP<5%) and 2 (5≤WTP<10%). In a similar study in 2003 (Cha, 2003), this figure was estimated to be 1.67 points of 93 consumers.

Table 3 shows the mean of the level of WTP in each group of the respondents. When the level of WTP among groups by demographic characteristics was compared, female respondents (1.57) had higher level of WTP than that of male respondents (1.44). The study of Aguilar and Vlosky (2007) and Jensen *et al.* (2004) had similar findings. Among age groups, respondents in 40s have the highest level of WTP (1.74), while respondents in 60s have the lowest level of WTP (1.27). Married respondents had higher level of WTP (1.54) than single respondents (1.42). Among the group of respondents with different education, consumers with some college education had the highest level of WTP (1.63). Respondents of blue collar job (2.11) and students (2.00) had higher level of WTP among occupation groups in the survey. Generally, the affluence of household influence the preference for environmentally certified products, including wood products, Higher monthly household income of between 3 and 4 million Won (2.00) and that of more than 5 million Won (1.94) had higher level of WTP in the analysis.

To test if there are differences in the level of WTP among independent groups in each respondent's characteristics (gender, age, marriage, education, occupation, and income), analysis of variance (ANOVA, among at least three groups) and t-test (between two groups) were applied.

Table 3 shows the results of t-test (gender, marriage) and ANOVA (age, occupation, education, income). Only income is significantly different among groups at 95% confidence level. This is different from the survey in 2003 (Cha, 2003), where married group (level of WTP=2.06) had more level of WTP than single group

Table 3. Consumers' level of WTP by respondents' demographic profile.

	Variables	Level of WTP ¹⁾			Statistical test	P
		Mean ²⁾	S.D.	N		
Gender	Male	1.44	1.15	66	T=-0.676	0.500
	Female	1.57	1.12	70		
Age (years)	20s	1.39	0.99	23	F=0.476 (DF=4)	0.753
	30s	<u>1.52</u>	1.09	44		
	40s	<u>1.74</u>	1.23	27		
	50s	1.45	1.29	31		
	60s -	1.27	1.01	11		
Marriage	Single	1.42	0.92	35	T=-0.475	0.636
	Married	1.54	1.20	101		
Education	- High school	1.29	1.19	31	F=0.587 (DF=3)	0.625
	Some college	<u>1.63</u>	1.15	27		
	College graduate	<u>1.59</u>	1.09	58		
	Graduate school	1.45	1.19	20		
Occupation	Self employed	1.19	1.27	17	F=1.193 (DF=6)	0.314
	Blue collar	<u>2.11</u>	1.27	9		
	White collar	1.44	1.09	27		
	Professionals	<u>1.55</u>	1.18	33		
	Housewife	<u>1.52</u>	1.09	31		
	Student	<u>2.00</u>	0.71	9		
	Unemployed etc.	1.20	1.14	10		
Income (/Month)	< 2 million Won	0.96	1.07	28	F=3.753* (DF=4)	0.006
	2 - 3 million Won	1.47	1.13	36		
	3 - 4 million Won	<u>2.00</u>	1.04	14		
	4 - 5 million Won	1.37	0.88	27		
	> 5 million Won	1.94	1.24	31		
Total		1.51		136		

*Means are significantly different at 95% confidence level

1) 0='0%', 1='less than 5%', 2='5-10%', 3='10-15%', 4='15-20%', 5='more than 20%'

2) underlined if the mean of the group is bigger than the total average value (1.51)

(level of WTP=1.26). However, also in this study the level of WTP of married group (1.54) has higher level of WTP than single group (1.42).

This is similar to the result of Aguilar and Vlosky (2007) who found a strong relationship between income and premium. This implies that there could be more markets for certified wood products where more affluent consumers live. The result of our current study is not strong enough to support the argument because the level of WTP of the second higher income group (4-5 million Won) was rather low. This is may be due to the sampling. There were 27 respondents of the income group, among which male respondents were 59% and respondents in their 60s were 15%, who showed the lowest level of WTP in the respective demographic category, took a rather bigger portion than the average, 49% and 8%, respectively.

5. Price premium for different wood products

The investigated products and suggested base prices are as follows: one bundle of copier paper (5,000 Won

about US\$ 4), wood frame (5,000 Won about US\$ 4), wood dining table (500,000 Won about US\$ 390), and 33 m² of wood flooring (1,000,000 Won about US\$ 770). Respondents were asked on how much they will pay more for each item of certified wood products which originated from sustainably managed forests. Example of pictures and base prices were provided with an open ended question asking the respondent's willingness to pay more for certified wood products (price premium).

Analysis was done with 136 respondents. Price premium of the consumers who are not willing to buy certified wood products was assumed to be 0. For the two low priced items, that is, copier paper and wood frame, respondents expressed their price premiums from 25 Won (0.5% WTP) up to 2,000 Won (40% WTP) in copier paper and 4,000 Won (80% WTP) in wood frame. The average price premiums of copier paper and wood frame was estimated to be 490 Won (9.8% WTP) and 580 Won (11.6% WTP), respectively (see Figure 2 and Table 4).

For higher priced wood products, such as wood dining

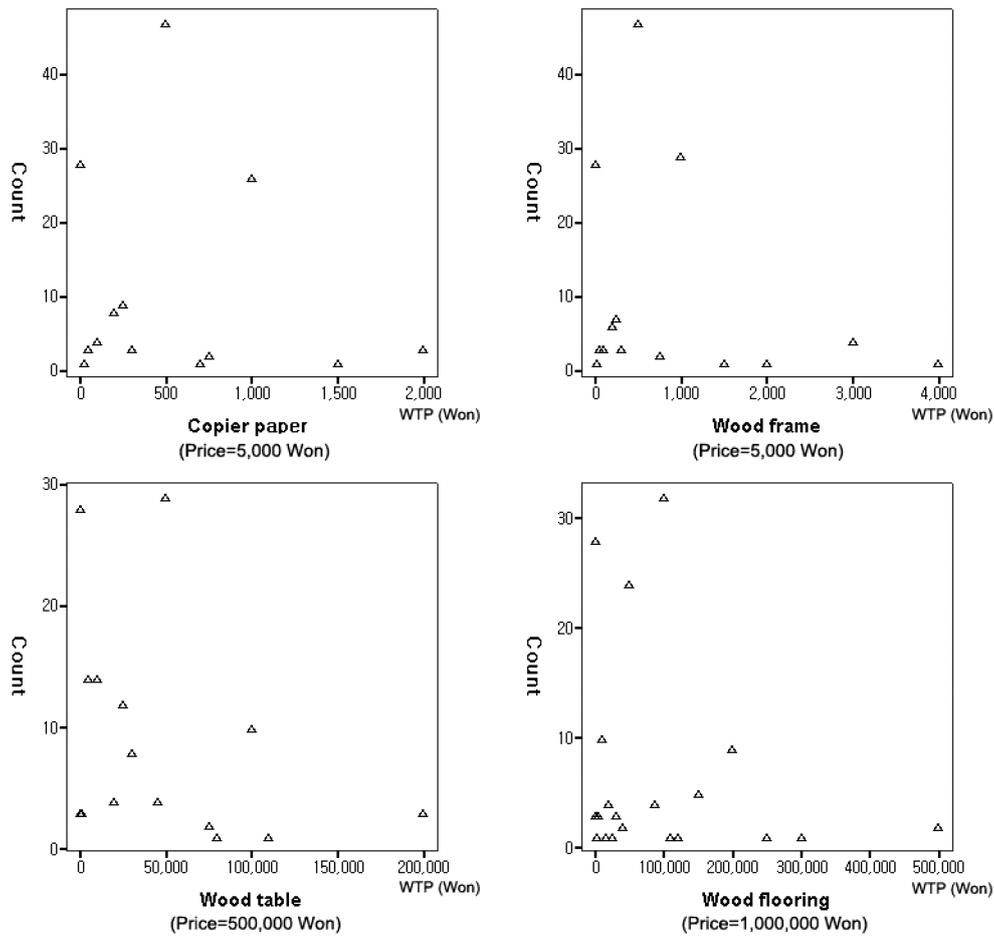


Figure 2. Distribution of price premiums for certified wood products by product type (n=136).

Table 4. Consumers' price premiums for selected certified wood products.

	Copier paper	Wood frame	Wood table	Wood flooring
Product base price (Won)	5,000	5,000	500,000	1,000,000
Average price premium for certified products (Won)	490	580	34,200	76,400
Average percentage price premium for certified products (%)	9.8 %	11.6 %	6.8 %	7.6 %

table and wood flooring, respondents expressed somewhat low percentage of price premium than low priced products, such as paper or frame. For wood dining table, respondents expressed their price premium for buying the products from 500 Won (0.1% WTP) up to 200,000 Won (40.0% WTP), the average price premium was estimated to be 34,200 Won (6.8% WTP). For wood flooring, consumers said they can pay more for it from 1,000 Won (0.1% WTP) up to 500,000 Won (50% WTP), the average price premium for wood flooring was estimated to be 76,400 Won (7.6% WTP) (see Figure 2 and Table 4). The data in Figure 2 indicates that the Korean consumers reveal their usual demand behavior, showing a reverse J-shaped demand curve with respect to incremental increase in price demonstrated by price premium

for certified wood products.

In a previous study by Joo and Lee (2000) in South Korea, the consumers' WTP of wood furniture and flooring ranged up to 20 percent over the market price, while 32.1 percent of the respondents were unwilling to pay more for certified wood products. Ozanne and Vlosky (1997) studied the consumers' willingness to pay price premiums for various wood products with various prices, such as stud (US\$1), ready-to-assemble chair (US\$100), wood dining set (US\$1,000), kitchen remodeling job (US\$5,000), and new home (US\$100,000). Sixty-three percent of the respondents expressed up to 12 percent of WTP. However, the percentage price premiums were different according to the price of the products. The cheapest US\$1 stud (a piece of lumber) had

the highest premium option of 'more than 50%', while US\$100,000 new home had the highest premium option of 'more than 10%'.

From the result of this study, it can be concluded that lower priced wood products, such as copier paper and wood frame, can enjoy higher price premium in percentage for certified wood products than higher priced products, such as wood dining table and wood flooring.

Similar results can be found in the survey of Aguilar and Vlosky (2007) and Jensen *et al.* (2004). In the study of Jensen *et al.* (2004), the price premiums for three wood products of book shelf (US\$28.80), chair (US\$199), and table (US\$799) were US\$3.74 (13.0%), US\$15.94 (8.0%), and US\$45.07 (5.6%), respectively. Veisten (2007) surveyed IKEA consumers' price premiums for a certified wood table (The prices of which were US\$330 in England and US\$233 in Norway) using CV method. The median price premium of English customers was 7.5 percent and that of Norwegian was 5.9 percent.

Conclusion

Upon adoption of the FSC forest certification in South Korea in 2005, forest certification, including forest management certification and chain-of-custody certification, is gradually expanding both in the public and private sectors, especially in wood product manufacturing sector. However, it is not easy to find certification logo, such as FSC, PEFC, and SFI in the market and most of the consumers even those who are working in paper or wood related companies do not know exactly about forest certification system, how it works, and how they can utilize the system.

The study revealed that the awareness of forest certification is still low (24.3% of the respondents knew or have heard of the system), but has somewhat increased during the last few years. Majority of the respondents (82.4%) recognized the need and significance of forest certification. More than three consumers out of four (77.2%) expressed their willingness to buy certified wood products. Respondents' willingness to pay more for certified wood products (WTP) were distributed from '0%' to 'less than 20%'. Many respondents (61.8%) expressed their willingness to pay more for certified wood products from more than 0 percent to less than 10 percent. The average WTP of the respondents for certified wood products was estimated to be 5.6 percent over the uncertified wood products.

From the results of the consumers' price premiums for four selected wood products which are familiar to general consumers, such as copier paper, wood frame, wood dining table, and wood flooring with different base prices, it can be assert that consumers' price premiums for certi-

fied wood products are different depending on the type and price level of the product. The price premiums for certified products are higher in percentage in the case of low priced products, such as copier paper and wood frame. In this study, expensive products, such as wood dining table and flooring, can enjoy price premiums only at a lower percentage compared to lower priced products.

Certified forest product market is a kind of niche market for green consumers' need. Therefore, wood product manufacturers, especially of consumer-friendly products, such as furniture, flooring, and paper products, should know market information about the consumers' willingness to buy and ability to pay more for certified wood products before launching a new product in the market. From this study, we can carefully suggest that female consumers of ages 30 to 40s, married, with some college education and relatively high income level can be a target consumer for the certified wood products. However, the findings of this study is not conclusive considering the limitation of sampling confined to the Seoul metropolitan area.

According to the Korea Chamber of Commerce and Industry surveyed in 2008, 75.2 percent of the consumers are willing to buy eco-friendly products (KCCI, 2008). With the expansion of green consumerism, including well-being and LOHAS (Lifestyle of Health and Sustainability) and the growing concern about local and global environmental problems, such as climate change, forest and wood products can play an important role in climate change mitigation through carbon dioxide sequestration. Forest certification as an effective tool to conserve the forest and promote sustainable forest management should be accepted worldwide as well as in South Korea. The portion of certified wood products in the market and their trade will increase with the expansion of forest certification system, such as FSC and PEFC.

Not only the adoption of international certification systems is increasing in South Korea, but also, discussion on the establishment of national forest certification system, including development of criteria and indicators of sustainable forest management, is underway with many participating forest stakeholders.

In conclusion, there could be feasible markets for certified wood products in South Korea, and four out of five consumers are willing to pay more for such products. For the forest certification system to be adopted and widely accepted, the awareness of forest stakeholders, including consumers, of certified forest products should be further increased.

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