

# Market Benefits of Chain of Custody Certification

## *Perspectives of Japanese Suppliers*

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Abstract: Japan grants the largest number of chain of custody certificates outside Europe and North America. Certified companies may receive market benefits from their own certification and certified products. In this study, we examined the benefits of chain of custody certification in the forest products market in Japan. A nationwide survey was conducted from October to December 2005 of 132 companies that had obtained a chain of custody certificate from one of the certifying bodies operating in Japan: the Forest Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification schemes (PEFC), or the Sustainable Green Ecosystem Council (SGEC). In the mailed questionnaire, respondents were asked if they received any premium from their certified products. The perceived level of benefits gained from a chain of custody certification was also measured using a 5-point scale. Results indicated that it was not possible for most Japanese companies to receive premium prices for certified forest products. Factor analysis determined three benefit dimensions: (1) business performance, (2) customer relations, and (3) environmental communication. The mean benefit rating of environmental communication was the highest, followed by customer relations. Business performance was rated significantly lower than the other two dimensions. Paper products companies, as well as large companies ( $\geq 300$  employees), received relatively high benefits from certification.

## 1. Introduction

Forest certification is a market-based instrument for promoting sustainable forest management. It ensures that forests are managed in accordance with a set of

standards considered environmentally appropriate, socially beneficial, and economically viable. Products originating from certified forests can be verified through a 'chain of custody' system that provides the ability to track them from the forest to the final product (Nussbaum and Simula, 2005). The number of chain of custody certificate holders has been increasing, and 8,600 certificates had been granted worldwide as of May 2007 (Kraxner *et al.*, 2007).

Although certificate holders are mainly located in Europe and North America, Japan grants the largest number of certificates outside these regions (Kraxner *et al.*, 2007). The number of chain of custody certificates issued in Japan has increased since the early 2000s, and more than 300 certificates had been granted by the end of 2005 (Owari and Sawanobori, 2007). Three certification schemes currently operate in Japan: (1) the Forest Stewardship Council (FSC), (2) the Programme for the Endorsement of Forest Certification schemes (PEFC), and (3) the Sustainable Green Ecosystem Council (SGEC). The FSC and PEFC are international certification programs, and the SGEC is a national certification scheme that was established in 2003. The FSC has dominated certification schemes in Japan, issuing more than 90% of all certificates. The chain of custody certificates provided by the PEFC and SGEC were first granted in 2004 and to date have been limited (Owari and Sawanobori, 2007).

Forest products suppliers are encouraged to take part in the certification process with the promise of gaining market benefits (Vidal *et al.*, 2005). A price premium has been considered the main benefit. Receiving a premium for certified products is important because it could potentially compensate for additional costs incurred in the implementation of certification (Aguilar and Vlosky, 2007). Other benefits such as enhancing business performance (Stevens *et al.*, 1998), keeping, satisfying, and gaining customers (Humphries *et al.*, 2001), and building better relations with the public (Hubbard and Bowe, 2005) may accrue to certified companies. However, little is known about the benefits certificate holders have actually gained in the Japanese market. To avoid misguided expectations, it is necessary to clarify the benefits resulting from chain of custody certification (Vidal *et al.*, 2005).

The purpose of this study is to examine the benefits of chain of custody certification within the forest products market in Japan. A nationwide survey was conducted to closely investigate prevailing experiences and perceptions among Japanese certificate holders. To achieve our objectives, we addressed the following research questions: Have suppliers received price premiums from the certified products they sold? What types of market benefits have suppliers gained from certification? How much benefit have suppliers gained from certification? What types of suppliers have received greater benefits? Based on findings derived from the data analysis, the market benefits of chain of custody certification are described from the perspective of Japanese forest products suppliers.

## **2. Methods**

We used a mail survey instrument for data collection. The survey targeted Japanese companies that had obtained a chain of custody certificate from the FSC, PEFC, or the SGEC. The certificate directories published online by the FSC Japan Promotive Office (currently the Japan Forest Stewardship Alliance), the Japan Gas Appliances Inspection Association (the only PEFC certifier in Japan at the time of data collection), and the SGEC were used. We assumed these directories covered all certificates issued in Japan, although a few minor problems were discovered (e.g., duplicate registrations). We made corrections based on our judgment prior to the survey.

We developed a self-administered questionnaire with a cover letter explaining the background and purpose of the study. In the questionnaire, respondents who had sold certified products were asked if they received any premium from the sale of the products. Those who answered "yes" were then asked what share of certified products that were sold had a premium, and on average how large a premium was received for each certified product sold with a premium. We also measured the perceived level of benefits gained from chain of custody certification using a 5-point scale, where a 1 indicated no benefit at all and a 5 indicated very great benefit. Prior to distribution, the questionnaire was pretested with seven Japanese companies to

check for biased, misleading, or confusing questions (Dillman, 2000).

The survey was directed to all certificate holders as of August 2005, except public organizations (five local governments and one university). We distributed the questionnaire to 247 certificate holders in October 2005, and all but one was successfully delivered. After 3 weeks, all nonrespondents were sent a reminder via fax. A total of 132 responses were received, with an adjusted response rate of 54% (132 / 246).

Although the survey achieved a high response rate, nonresponse bias was examined using the extrapolation method, which assumes that individuals who respond less readily are more likely to be nonrespondents (Armstrong and Overton, 1977; Aaker *et al.*, 1998). Because no significant differences were found for any of the questions, nonresponse bias was not considered to be an issue.

Collected data were analyzed using the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL). The percentage of respondents with price premiums was computed, and a chi-square test was used to measure significant differences between product groups. An exploratory factor analysis (maximum likelihood with varimax rotation) was performed to assess the underlying dimensionality of market benefits. The reliability of each factor was tested using the reliability coefficient alpha. Summated scales of benefit variables were created, based on the factor solution. The means and standard deviations of respondents' ratings were computed for each benefit dimension. The assumption of normality was questionable in some cases; thus, nonparametric significance testing was used to determine differences between groups.

### **3. Results**

#### **3.1. Price premiums for certified forest products**

Of 132 respondents, 101 companies had sold certified products and answered this question. Only 11 respondents (11%) reported a price premium on their certified products in 2004 (Figure 1). Most companies did not receive a price premium. Although a relatively small proportion of respondents from paper products

companies (paper, printed material, chips, and pulp) had received a price premium compared to respondents from wood products companies (e.g., sawn goods, woodwork, log, joinery, furniture, wooden house, and glulam sources), the difference was not statistically significant. The results indicate that a price premium is rarely achievable, regardless of the product group.

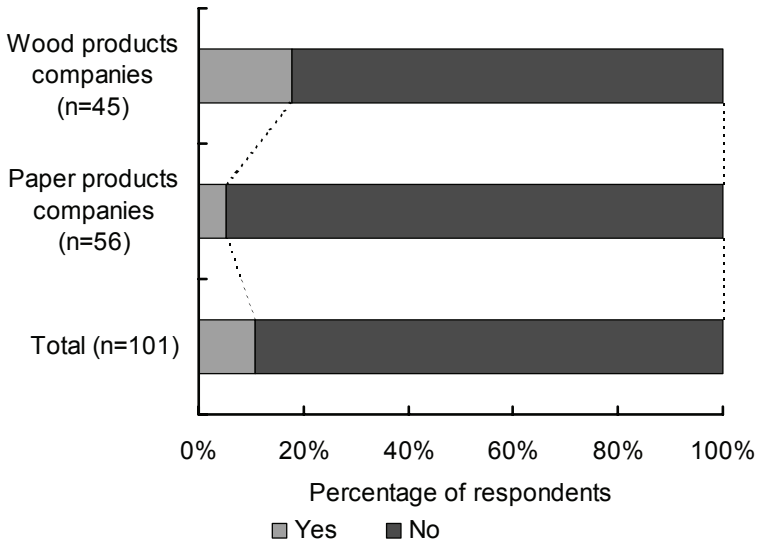


Figure 1. The percentage of chain of custody certified companies with a price premium in 2004

Eleven companies receiving a price premium reported the share of certified products that yielded a premium (Figure 2) and the average premium received (Figure 3). Half of the respondents answered that ‘1 – 9%’ of the company’s certified products were sold with a premium. The majority of respondents answered that they received an average of an additional ‘5 – 9%’ of the product price by selling certified products. Even though a premium existed on the certified products, both the share and the amount were small.

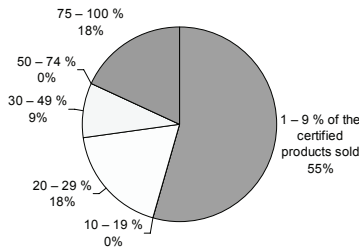


Figure 2. Share of certified forest products with a price premium (percentage of certified products sold,  $n = 11$ )

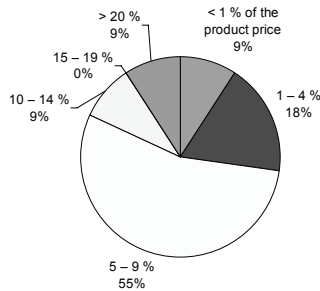


Figure 3. Average price premium received from certified forest products (percentage of product price,  $n = 11$ )

### 3.2. Dimensionality of market benefits

Of the 132 companies responding, 120 answered this question. Our sample size of 120 observations and eight measured items exceeded the recommended five observations per variable (Hair *et al.*, 1998). After the preliminary analysis, the 'gaining new customers' item was removed because of a low communality value (0.479). Factor analysis with seven items was subsequently performed. In the initial solution, the third eigenvalue (0.752) was under the commonly used cutoff of 1 (Hair *et al.*, 1998). We chose to retain the third factor for further analysis because of its high interpretability.

Factor analysis with varimax rotation provided a three-factor solution distinguishing sets of market benefits that respondents had perceived to gain from chain of custody certification (Table 1). It represented 78.5% of the total variance.

The first factor included two items - ‘an increase in sales volume’ and ‘higher profitability.’ We labeled this factor the benefit of enhancing ‘business performance.’ The second factor relied heavily on two items - ‘keeping existing customers’ and ‘more customer satisfaction.’ We labeled this factor the benefit of maintaining ‘customer relations.’ The third factor consisted of three items - ‘good public reputation,’ ‘acceptance from environmentally sensitive customers,’ and ‘acceptance from environmental groups.’ We labeled this factor the benefit of facilitating ‘environmental communication.’ For each factor, the reliability of coefficient alpha exceeded the lower limit of 0.70 (Hair *et al.*, 1998).

Table 1. Dimensionality of market benefits

Items	Rotated factor loadings			Communality
	Factor 1: Business performance	Factor 2: Customer relations	Factor 3: Environmental communication	
An increase in sales volume	<b>0.918</b>	0.249	0.186	0.939
Higher profitability	<b>0.828</b>	0.306	0.209	0.824
Keeping existing customers	0.413	<b>0.657</b>	0.192	0.638
More customer satisfaction	0.311	<b>0.871</b>	0.250	0.918
Good public reputation	0.128	0.502	<b>0.679</b>	0.729
Acceptance from environmentally sensitive	0.192	0.458	<b>0.700</b>	0.736
Acceptance from environmental groups	0.196	0.036	<b>0.818</b>	0.709
Sum of squares	1.89	1.81	1.80	Total 5.49
Percentage of variance	27.0	25.8	25.7	78.5
Coefficient Alpha	0.93	0.84	0.85	

Note: An exploratory factor analysis (maximum likelihood with Varimax rotation) was performed, n=120.

### 3.3. Perceived level of market benefits

Among the benefit dimensions, the mean rating of ‘environmental communication’ was the highest (2.9), followed by ‘customer relations’ (2.8) (Figure 4). ‘Business performance’ was rated the lowest (2.0). In any dimensions, the mean rating was below the midpoint of the scale (3). A significant difference was observed between benefit dimensions according to the Friedman test ( $p < 0.01$ ). Wilcoxon’s signed-ranks test with Bonferroni correction (three comparisons) determined that the benefit level of business performance was significantly lower than the other two dimensions ( $p < 0.01$ ).

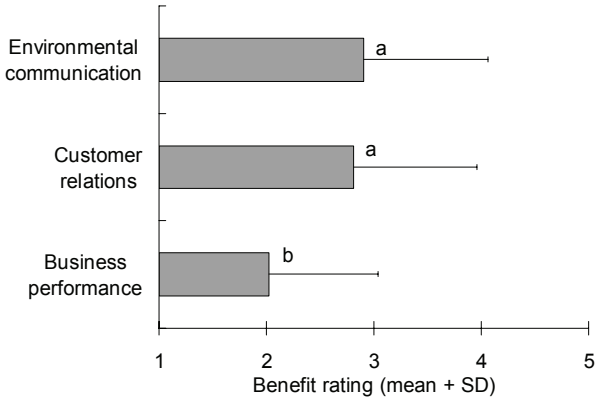


Figure 4. Mean benefit of chain of custody certification. Benefit ratings are based on a 5-point scale, where 1 denotes no benefit at all and 5 indicates very great benefit. Means followed by different letters differ significantly according to Wilcoxon’s signed-ranks test with Bonferroni correction ( $p < 0.01$ ).

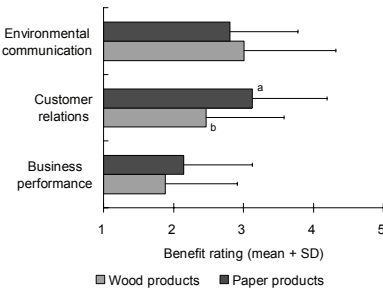


Figure 5. Mean benefit of chain of custody certification by product group. Means followed by different letters differ significantly according to the Mann–Whitney U-test ( $p < 0.01$ ).

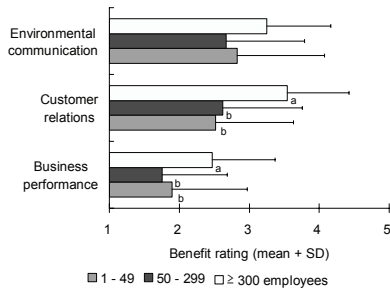


Figure 6. Mean benefit of chain of custody certification by company size. Means followed by different letters differ significantly according to the Mann–Whitney U-test with Bonferroni correction ( $p < 0.05$ ).

When comparing product groups, paper products companies perceived significantly higher benefits compared to wood products companies in the dimension of customer relations (Mann–Whitney *U*-test,  $p < 0.01$ ; Figure 5). We also compared the perceived benefits of chain of custody certification by company size (represented by the number of employees). Using the Kruskal–Wallis test ( $p < 0.01$ ), we found significant differences in two benefit dimensions (Figure 6). The Mann–Whitney *U*-test with Bonferroni correction (three comparisons) determined



that larger companies ( $\geq 300$  employees) gained significantly higher benefits than smaller companies ( $< 300$  employees) with regard to customer relations and business performance ( $p < 0.05$ ).

#### 4. Discussion

Forest certification is based on the premise that customers are willing to pay a premium for products originating from well managed forests (Carter and Merry, 1998). However, our survey revealed that most Japanese suppliers do not receive premium prices. The result is similar to observations on certified companies in Europe and North America, where little or no premium is associated with certified products (Humphries *et al.*, 2001; Hubbard and Bowe, 2005; Owari *et al.*, 2006). Even when a premium is evident, companies receive only a small amount from some of the certified products they offer. The expected value of premiums may not provide enough profit to cover the cost of chain of custody certification. In contrast to the original premise, forest certification may compel suppliers, and not the consumers, of forest products to bear the cost of sustainable forest management.

We found three benefit dimensions of chain of custody certification: (1) enhancing business performance, (2) maintaining customer relations, and (3) facilitating environmental communication. Certificate holders, on average, did not perceive that they were receiving high benefits from the certification process. As in North America (Vidal *et al.*, 2005), chain of custody certification is not an effective marketing tool in Japan. Immaturity of the certified products market may explain the perceived lack of benefits (Vidal *et al.*, 2005). Respondents perceive that they gain some benefits from certification in the aspects of environmental communication and customer relations, but certification provides few benefits with regard to business performance. A lack of price premiums is probably the major reason why certification does not enhance business performance. As Vidal *et al.* (2005) noted, the benefits associated with chain of custody certification may be long-term and indirect.

Paper products companies, as well as large companies ( $\geq 300$  employees), gain relatively high benefits in the customer relations dimension. In fact, paper products companies comprised more than 90% of the large company survey respondents. They are mainly doing business with corporations that are often listed on the stock market. The demand for certified paper has been increasing in the Japanese market, and more corporations now use certified paper for CSR reporting, photocopies, and promotion materials (Owari and Sawanobori, 2007). As the use of recycled paper becomes the norm, Japanese corporations consider certified paper an environmentally friendly substitute. By labeling printed material with certification logos, corporations can communicate their sense of responsibility to stakeholders. For paper products companies, chain of custody certification is becoming necessary to maintain and satisfy their customers.

Large companies are experiencing more improvement in business performance than small companies. This result is consistent with observations in North America, where smaller companies do not perceive they are receiving benefits from chain of custody certification (Vidal *et al.*, 2005). Large companies normally deal with high-volume customers who are probably more sensitive to environmental issues. The demand for certified products may be stronger for large companies than for small companies.

## **5. Conclusions**

Based on the results of this study, Japanese forest products suppliers may expect to receive benefits with regard to environmental communication and customer relations from chain of custody certification. However, they should not expect enhanced business performance through price premiums. This study is intended to provide insight into the Japanese market for certified forest products. However, the market changes from year to year and follow-up studies are therefore needed to clarify the market development of certified forest products.

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## 日本のサプライヤーからみたCoC認証の市場利益

尾張 敏章・澤登 芳英

**要約**：ヨーロッパと北米以外の国々のなかでは、日本はCoC（Chain of Custody）認証を取得している事業者が最も多い。CoC認証取得事業者は、その認証資格および森林認証製品の販売によって市場利益を得ていると考えられる。そこで本研究では、日本の林産物市場におけるCoC認証の利益について調査を行った。2005年10 - 12月にかけて全国規模のアンケートを郵送法により実施し、132事業者から回答を得た。回答事業者はFSC（森林管理協議会）、PEFC（森林認証承認プログラム）、SGEC（緑の循環認証会議）のうちいずれかのCoC認証を取得していた。本調査ではまず、森林認証製品から価格プレミアムを得たかどうかを質問した。さらに、CoC認証から得た利益の大きさを5点尺度により計測した。その結果、日本の大部分のCoC認証事業者が森林認証製品から価格プレミアムを得ていないことがわかった。因子分析の結果から、市場利益に関して事業の業績、顧客との関係、環境コミュニケーションの3つの因子が抽出された。各因子の利益評価の平均値から、環境コミュニケーションに関する利益が最も大きく、顧客との関係がそれに続いた。事業の業績に関しては他の2因子よりも利益が有意に小さかった。また、紙製品事業者および大規模事業者（従業員数300人以上）が相対的に大きな利益をCoC認証から得ていた。

**キーワード**：森林認証製品, CoC認証, 日本, 市場利益, 価格プレミアム