

Assessing Customer Perceived Value on Farm Machinery: The Case of Two-Wheel and Four-Wheel Tractor Market in Sri Lanka

U. I. SENEVIRATHNA AND J. M. U. K. JAYASINGHE

*Department of Agribusiness Management, Faculty of Agriculture and Plantation Management,
Wayamba University of Sri Lanka, Markandura, Gonawila (NWP)*

ABSTRACT

Two-wheel (TW) and four-wheel (FW) tractors are widely used by the agricultural sector in Sri Lanka as an effective solution for the problems associated with labour scarcity and need of proper and on time land preparation. This study evaluates, using the concept of Customer Perceived Value (CPV), what sort of benefits and costs will mostly have an impact on farmers' selection of a particular type (TW and FW) from a type of brands available in the market with a certain quality (i.e. "brand-new" and "recondition") for this purpose. The CPV of each case, which takes into account of a number of variables associated with how customers value various benefits and costs associated with purchasing of that product, was estimated using the data collected through a questionnaire-based survey conducted with a sample of two-wheel ($n = 40$) and four-wheel ($n = 40$) tractor owners in the Kurunegala and Anuradhapura Districts. The results suggest that there is a significant difference of the CPV between the "brand-new" and "reconditioned" two-wheel tractors and that of four-wheel tractors. This highlights the fact that farm machinery market must take into account of the factors that used to estimate CPV in their promotional aspects, thus move into "customer-oriented" approach rather solely depend on traditional "low cost" product-oriented approaches.

Key Words: Customer Perceived Value, Farm machinery, Two-wheel & Four-wheel Tractors.

INTRODUCTION

Domestic market of farm machinery is comparatively large and competitive. The machinery in Sri Lanka is seriously suffering from competition with low price imported products. It is reported that several agricultural machine factories have been closed or about to close, because competitor's prices are less than or equal to the material cost of Sri Lankan products (Bandara, 2005).

Nearly eight major competitors of Two-Wheel tractor (TW) and Four-Wheel tractor (FW) exist in the local market including both importers and local manufacturers. TW tractors, FW tractors, and related spare parts are locally manufactured or imported. Imported tractors and tools including both brand-new and reconditioned are mainly from India, China, Japan, Taiwan and United Kingdom. Statistics on their importation from 1997 to 2001 are presented in Table 1.

Table 1 - Statistics on importation of farm machinery:

Type of Machine	Number of Units				
	1997	1998	1999	2000	2001
TW	56,349	61,782	68,368	74,827	82,372
FW	21,247	22,620	23,659	24,687	24,714
Total	77,596	84,402	92,027	99,514	107,086

Source: Inventory of agricultural machinery and tools in Sri Lanka (1992-2001)

Both TW tractors and FW tractors are distributed using two main marketing channels. First, Farmers are received farm machinery and equipments through outside dealers and they involve as intermediaries in this situation. Second, Farmers

directly purchase machinery from company's outlets and there is no intermediaries' involvement.

Companies distribute machinery and equipments with the attention focused on several target groups which have been identified according to horsepower (hp) requirements of farmers. Though different brands are available in the market, choice of particular brand and horsepower category depend on farmer's expectation and their value. How customers make choice to buy from a certain company or from their competitors determine the stability of a given company. Rise or fall of a company's future prospects depends upon this factor. Mostly customers will choose the supplier whose products offer them the best value, which means the most attractive benefits at the most reasonable price (<http://www.cval.com/managing.htm>, 2005).

As customers are value maximizes within the bound of search cost, limited knowledge, mobility and income, they form an expectation of value and act on the product (Kotler, 2003). For this reason the supplier that can offer superior customer Perceived value (CPV) will generally exhibit raising market share, rapid growth and improving profitability. Therefore, today the concept of customer perceived value has been considered a key driver of customer's satisfaction, customer loyalty and hence, company profitability (Heinonen and Strandvik, 2004).

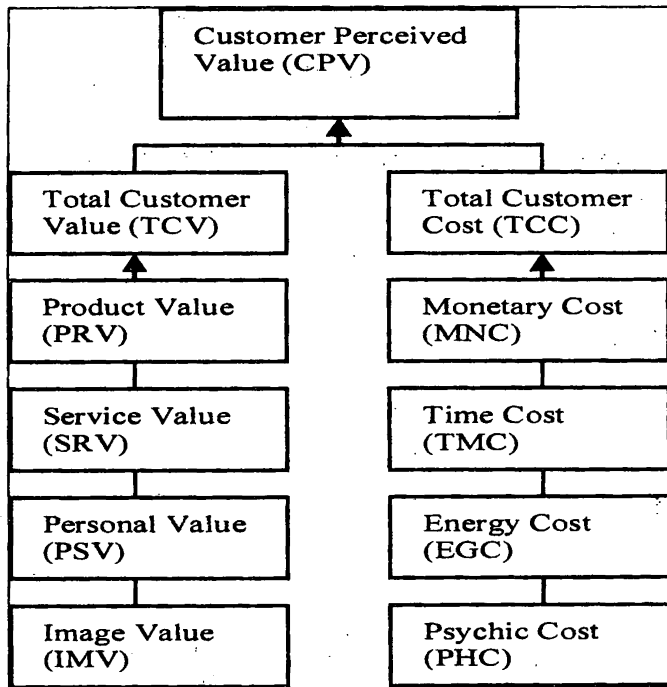
Up to now a more systematic and successive study based on customer perceived value has not been conducted regarding the farm machinery industry in Sri Lanka. With the benefits achieved by many other countries world wide using this method in mind, this study also implements the same aspect and the authors believe that it will ultimately enable companies to better identify real value of their offers from the customers' point of view and to get accustomed accordingly.

METHODS

Conceptual Frame Work

This study followed the concept, which has been presented by Kotler (2003) to achieve its objectives. According to Kotler, CPV is the difference between the prospective customer's evaluation of all the benefits and all the costs of an offering and the perceived alternatives. Total customer value is the perceived monetary value of the bundle of economic, functional, and psychological benefits customers expect from a given market offering. Total customer cost is the bundle of costs customers expect to incur in evaluating, obtaining, using and disposing of the given market offering (Fig. 1).

Fig. 1- Determinants of customer perceived value:



Source: Kotler (2003)

According to the Figure 1, Total Customer Value (TCV) is a summation of Product Value (PRV), Service Value (SRV), Personal Value (PSV), and Image Value (IMV) as well as Total Customer Cost (TCC) can be derived from aggregation of Monetary Cost (MNC), Time Cost (TMC), Energy Cost (EGC), and Psychic Cost (PHC).

$$TCV = PRV + SRV + PSV + IMV \quad (1)$$

$$TCC = MNC + TMC + EGC + PHC \quad (2)$$

CPV could be derived from the difference of TCV and TCC with reference to its definition;

$$CPV = TCV - TCC \quad (3)$$

Equation (3) indicates that CPV has a positive relationship with TCV and negative relationship with TCC, which means an increment of TCV, will cause to raise CPV and increase of TCC will result a reduced CPV.

The following equation is drawn from substituting (1) and (2) in to (3)

$$CPV = [PRV + SRV + PSV + IMV] - [MNC + TMC + EGC + PHC] \quad (4)$$

If $TCV > TCC$, its mean $CPV > 0$ Product will be accepted by the customer. If $TCV < TCC$, its mean $CPV < 0$ Product will be rejected by the customer.

Therefore, Company should try to increase marginal value of CPV by maximizing TCV or minimizing TCC.

Empirical Model

Above model had been employed for this study. Each determinant of the model was measured using different variables. Variables considered are shown in the Table 2.

Table 2 – Description of variables:

Variable Name	Descriptions
TCV	
PRV	
MR	Machine Reliability
MD	Machine Durability
EM	Efficiency of Machine
LP	Land Preparation Suitability
RV	Resale value of Machine
SRV	
AS ₁	After sale services
PSV	
AG	Agents
IMV	
BN	Brand Name
TCC	
MNC	
PT	Price of Tractor
PS	Price of Spare parts
MC	Maintain Cost
TMC	
EP	Easiness to Purchase
LP	Leasing facilities
AT	Availability of Tractor
AS ₂	Availability of Spare parts
EGC	
FC	Fuel Cost
PHC	
WT	Wear and Tare

Using equation (1)

$$Avg\ TCV = Avg\ PRV + Avg\ SRV + Avg\ PSV + Avg\ IMV \quad (5)$$

Using equation (5)

$$Avg\ TCV = \{[(MR + MD + EM) / 3 + (RV + LP) / 2] + AS_1 + AG + BN\} \quad (6)$$

Using equation (2)

$$Avg\ TCC = Avg\ MNC + Avg\ TMC + Avg\ EGC + Avg\ PHC \quad (7)$$

Using equation (7)

$$Avg\ TCC = [(PT + PF + PS + MC) / 4 + (EP + LF + AT + AS_2) / 4 + FC + WT] \quad (8)$$

According to equation (3)

$$Avg\ CPV = Avg\ TCV - Avg\ TCC \quad (9)$$

In this study equation (6), (8), and (9) were used to find Avg CPVs.

Data Collection

Questionnaire based survey was carried out during May in year 2005. Sample of 80 tractors owners were selected randomly from Kurunegala and Anuradhapura districts. Questionnaire was based on statements associated with each benefit and cost variables shown in table 2. Perceived value or cost of tractor owners on each variable were measured using psychometric “Likert scale” (Oppenheim, 1992). Scale rang from 1 to 5 and 1 stood for “the least valuable” and “the least cost” while 5 stood for “the most valuable” and “the most cost”.

RESULTS AND DISCUSSION

Descriptive Statistics

Selected tractors were categorized as brand-new and reconditioned tractors. Their brand names and number of tractors are presented in Table 3.

Table 3 – Statistics of selected tractors:

Brand Name of Tractor and Their Category	Number of Tractors
TWT	
Brand-new (12 hp)	
Sifang	13
Unimo	9
Agrotec	8
Brand-new(7.5 hp- 8 hp)	
Kubota	6
Reconditioned (7.5 hp)	
Kubota	4
FWT	
Brand-new (45 hp-50 hp)	
Tafe	7
Messy Ferguson	5
Mahendra	9
Reconditioned (45 hp)	
Messy Ferguson	19
Total	80

Comparison of CPV of Two-Wheel Tractors and Four-Wheel Tractor

The results suggested that perceived value of TW tractors range from 1.25 (SD 0.24) to 0.68 (SD 0.14). In addition, brand-new TW tractors indicated the highest perceived value. The difference of CPV between those two categories was 0.57 (Figure 2).

Lesser-perceived value of Reconditioned TW tractors would be due to the lesser SRV, higher MNC, and higher EGC compared to Brand-new tractors. IMV of Brand-new TW tractors are lesser than Reconditioned TW tractors while its PHC is higher than Reconditioned. Other values of variables remain same in both (Fig. 3).

Figure 2 also shows the perceived value of FW tractors has range from 0.56 (SD 0.9) to 0.82 (SD 1.78). In addition, a highest perceived value was observed in reconditioned FW tractors. The difference of CPV was 0.22.

Lesser-perceived values of brand-new FW tractors may be due to low PRV, low IMV, and high PHC compared to reconditioned FW tractors. SRV of brand-new FW tractors are higher than reconditioned

FW tractors. At the same time, MNC, TMC, EGC have similar values for both brand-new and recondition (Fig. 4).

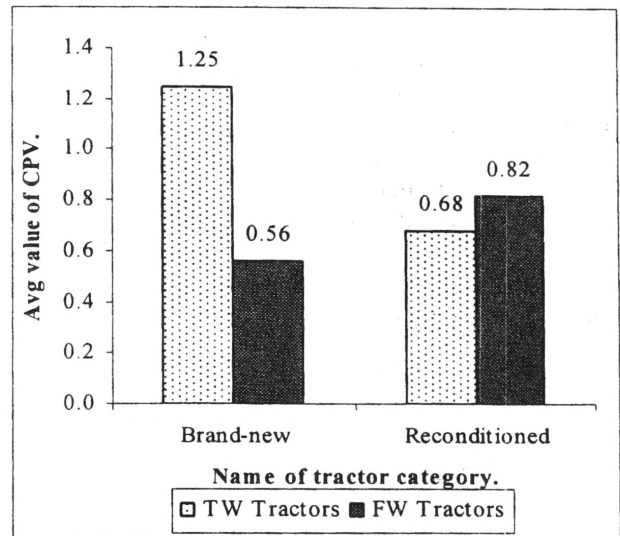


Fig. 2- CPV of two-wheel tractors and four-wheel tractors:

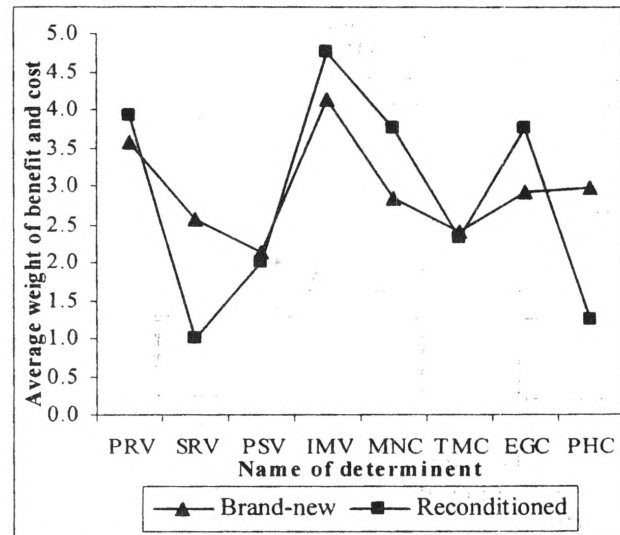


Fig. 3- Comparison of benefits and cost of brand-new and reconditioned two-wheel tractors:

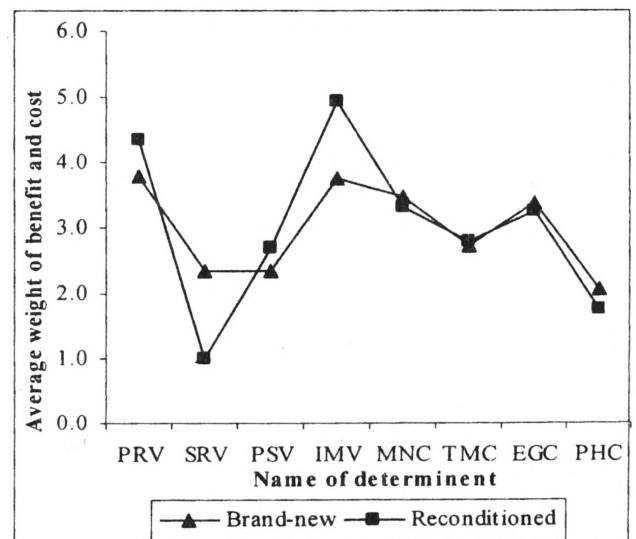


Fig. 4 - Comparison of benefits and cost of brand-new and reconditioned four-wheel tractors:

Brand Comparison of Two-Wheel Tractors

CPV varies within the category of two-wheel tractor according to their brand name. Sifang was found to be a prominent brand having the highest perceived value within the 12 hp category. Kubota Brand-new (RK-80) has shown the highest perceived value compared to Kubota reconditioned (K-75) which belongs to 7.5 hp category (Fig. 5).

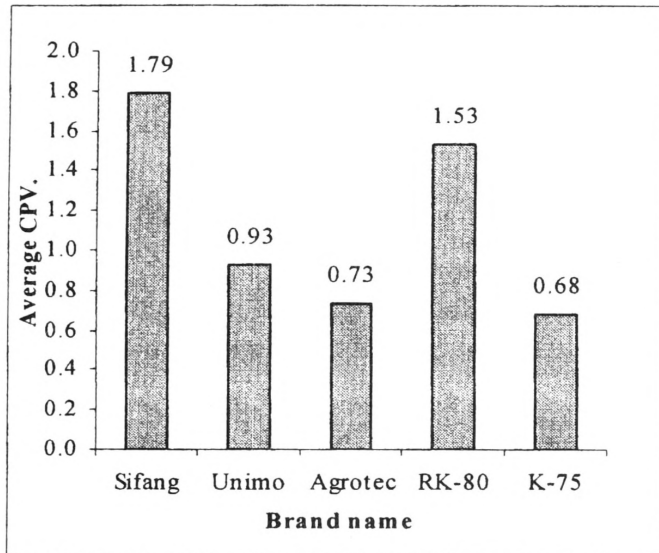


Figure 5 – Brand comparison of two-wheel tractors:

Brands of 12hp category such as Sifang, Unimo, and Agrotec are almost same in association variables such as PT, PS, WT, EM, MD, and RV. Therefore, no different CPV are resulted under the 12 hp category.

However, Sifang and Kubota brands have created an attribute positioning in farmers mind i.e. IMV of these two brands were higher than other brands available in the market.

Brand Comparison of Four-Wheel Tractors

Different CPVs were recorded for different brands of four-wheel tractors. Both MF 240 and MF135 have showed highest CPV while Tafe and Mahendra obtained a lower position with respect to their CPVs (Fig. 6).

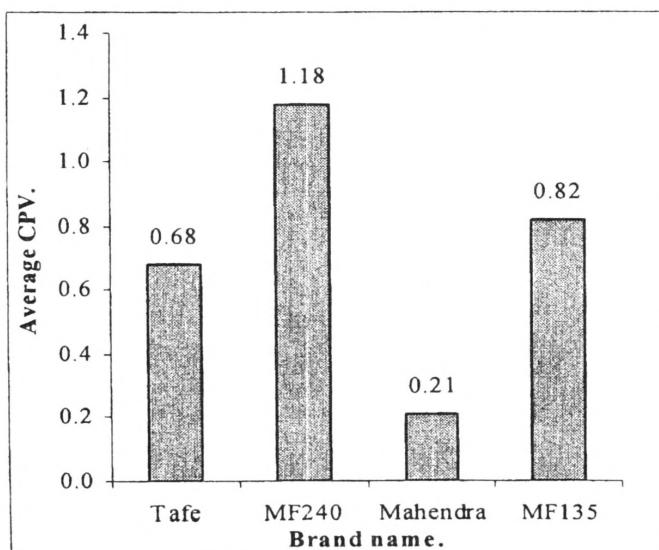


Fig. 6 – Brand comparison of four-wheel tractors:

Tractors from India for example Tafe and Mahendra have lesser IMV and PRV than tractors of Europe. Simultaneously, PHC of them were higher than European tractors. For instance, MF brands are durable than Indian FW tractors. Hence, it has created higher IMV and PRV among farmers. However, higher MNC of these tractors had negative impact on purchasing decision of farmers.

Farmers have the general belief that tractors and spare parts manufactured in such countries as China and India are not durable. As a result, farmers set high PHC on two categories of tractors i.e. FW and TW, which are imported from such countries.

CONCLUSIONS

The results from the analysis show that, companies could improve their tractors in three ways. First, they can increase Total Customer Value by improving features of tractor, services, and personal and /or image benefits. Improvements of product features such as hydraulic system, break system, comfortable seat with security options, power steering system, fuel conservation technique, quality improvements of spare parts and effective warranties could be used for product augmentation.

Good customer care and long-term friendship with sales persons would be an effective way to improve personal values. After-sale services should be enhanced because of their impact on time cost and customers reliability towards the company.

Second is the reduction of non-monitory cost by reducing time of purchasing tractors and getting leasing facilities. Tractors and spare parts should be made readily available in order to reduce TMC as well. Normally, company practices pushing strategies giving considerable commissions to agents. Therefore, farmers rarely get maximum benefits on their products. Therefore, company should examine their marketing channels and the benefits should be made available for the farmers. At the same time, allowances, discounts and competitions could be implemented to enhance product value.

Third, the company could practice pricing strategy in order to reduce MNC for the buyers. It might be possible to implement by keeping fewer profit margins with company. Specially, companies, which are selling brand-new MF and brand-new Kubota tractors, should pay their attention on reduction of prices of these brands and their spare parts.

ACKNOWLEDGEMENTS

The authors wish to thank Mr. K.C. Edirisinghe, Economist, Ruber Research Institute, Agalawatta. Moreover, the sincere thank goes to Mr. H.A.W.S. Gunathilake, Lecturer, Department of Plantation Management, Wayamba University of Sri Lanka. They are also grateful to the staff of Brown & Company Limited, Agriculture Directorate, No: 75, Devanampiyathissa Mawatha, Colombo 10. It is also wished to grant the gratitude Dr. M.H.M.A. Bandara, Agricultural Engineer, Farm Mechanization Research Centre (FMRC), Maha- Illuppallama.

REFERENCES

- Bandara. M.H.M.A (05 May 2005), Agricultural Engineer, Farm Mechanization Research Centre (FMRC), Mahalluppallama.
- Bradley T.Gale (2002), *Optimize you're pricing with value Accounting and value score card.*
- Heinonen and Strandvik (2004), A Framework for Measuring Customer Perceived Value of E-services.
- <http://www.cval.com/managing.htm>. Accessed on 08 July 2005.
- Kotler Philip, Marketing Management, eleventh edition, (2003), Chapter 3, "Building customer satisfaction, value and retention."
- Oppenheim (1992). "Questionnaire Design, Interviewing and Attitude Measurement."