Competitiveness through Energy Management: Evidence from A Kerala based Agro-Machinery Manufacturing Unit

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ABSTRACT

Agricultural machinery manufacturing industry has got strategic significance in the Indian economy and it has been extended priority status by the Government. But, in the wake of globalization pressures sweeping across the globe, even established players in this industry face considerable challenges, in the form of eroding market shares, dwindling profitability, lowering sales growth rates etc. It has become imperative for any player to draw up well thought-out, meticulously planned business strategies for survival and growth. In the above context, this paper seeks to (i) study the relative competitiveness of KAMCO- a Kerala based agro-machinery manufacturing company vis-à-vis major industry players and to trace the major trends over the years, (ii) analyse as to how energy management has helped the company to significantly improve its profitability and competitiveness, and (iii) suggest pragmatic strategies for further enhancing the profitability and competitiveness of the company through cost management.

Introduction

The significance of productivity and quality in industrial production is growing day by day, primarily as a result of the ever-growing competition in industry and business in the wake of the pressures of globalization. In order to withstand the pressures of competition, there is a heightened need to improvise the cost effectiveness of manufacturing processes and at the same time maintaining quality. Accordingly, it has become imperative for businesses to constantly seek new and innovative means to production processes and manufacturing techniques, and new frontiers of technology for enhanced competitiveness of operations. Energy management is one of the cardinal areas wherein business can focus for enhanced competitiveness through cost reduction. In this context, this paper seeks to (i) study the relative competitiveness of

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Kerala Agro-Machinery Corporation (KAMCO)- a Kerala based agro-machinery manufacturing company vis-à-vis the other major players in the industry and also to trace the major trends over the years, (ii) analyse as to how energy management has helped the company to significantly improve its profitability and competitiveness, and (iii) suggest pragmatic strategies for further enhancing the profitability and competitiveness of the company through cost management. Broadly falling in line with the objectives of the paper as mentioned above, this paper is organized into four major parts. Part – I gives a broad overview of the manufacturing context in the developing world with special reference to India. Part– II studies the relative competitiveness of a Kerala-based manufacturing company vis-à-vis other major players in the industry. Part – III takes up the specific case of KAMCO and studies as to how its energy management (electricity) practices contribute to its competitiveness. Part – IV suggests a few strategies further enhancing the cost competitiveness of KAMCO and is followed by the concluding remarks of the author.

New Manufacturing Context and the Competitiveness Imperative

Growing interest in industrial competitiveness has now currently become a global phenomenon prominent across all economies–developed and developing, though it initially originated in the developed world. Wignaraja (2001)[1] has observed, "Concerns about the process of industrial restructuring in an integrated world economy have sparked widespread interest in the concept of competitiveness as applied to national economies and enterprises within them. This interest originated in the developed world but has recently spilled over into developing countries and economies in transition". The central issue of competitiveness of developing countries is "the creation of efficient industrial capacity"[2]. Accordingly, a new manufacturing context is fast emerging in the developing world wherein apart from knowledge and technological progress, five mutually reinforcing processes are vitally significant, viz. (i) revolutionary changes in ICT, (ii) emergence of globally integrated value chains, (iii) increasing global competition associated with falling trade barriers, (iv) new rules of the game (introduced through WTO and by foreign buyers of output), and (v) changing consumer demands.[3]

Stagnancy in Indian Manufacturing and Sectoral Imbalances

In India, enhancement of manufacturing competitiveness has got added significance in the ongoing LPG regime, particularly in the later years of globalization (viz. 2000s) because of intensified competition. In fact, even before the LPG era the existence of a 'relative stagnation' was

conclusively demonstrated by Ahluwalia (1985)[4], between FY 1967 and FY 1980, and that this 'relative stagnation' continued even after FY 1980. Nagaraj (2006)[5] who has continued this work in the 1980s and found that the growth rate during 1980-81 to1986-87 is higher than that during 1966-67 to 1978-79; but comparable to the one during 1959-60 to1965-66 period. The already existing stagnation problem has been continuing in the ongoing LPG era also, in spite of an upturn in the eighties. The problem has in fact worsened owing to growing imbalance between major sectors of the economy, characterized by fast growing share of services sector, constantly declining share of agriculture sector and stagnating industry sector (particularly the manufacturing sub-sector within it). This has prompted the Government of India to set up a specialized body, NMCC (ie. National Manufacturing Competitiveness Council) to promote competitiveness of Indian manufacturing. As of FY 2008, the share of agriculture, industry and services are respectively 17.6%, 29.4% and 53%. As the imbalance between the three major sectors grows, it is imminent to chalk out urgent policy measures to correct the imbalance.

Enhanced Competitiveness of Indian Manufacturing: an Imperative

It is noted that in India the share of industries sector to the national GDP has been at about 27% for the last two decades or more. Of this, the share of manufacturing sub-sector has been roughly about 17% throughout. However, going by international standards, this share of manufacturing sector may be observed to be quite low. (Table I). Iyer, A., Kandaswamy, K., et. al[6] have pointed out, "Without a doubt, manufacturing is the backbone of the economy in most countries, especially so in fast growing emerging markets. It is clear that for the Indian manufacturing to successfully distribute wealth across its population, manufacturing has to grow from its current 17% of GDP to a number closer to 30% (which is the standard for most developed economies)."

Country	Agriculture	Industry	Manu facturing	Services
Brazil	5	31	18	64
Russia	6	38	19	56
India	18	28	16	54
China	12	47	33	41

Table I: Composition of GDP in BRIC Countries (as of 2006)

[Source: *World Development Indicators 2008*, The World Bank, USA., 2008, pp.202-204)

Indian manufacturing grew only at 6.3% during 1991 to 2003 as against 12% in China. NSM[7] (2006) formulated by NMCC estimates that to attain the targeted GDP growth rate of 8 to 10 per cent, the

country should target a minimum manufacturing growth rate of 12 per cent per annum. Besides, the share of manufacturing should be raised to 30 to 35% by 2020.

Challenges to Indian Manufacturing – the Issue of Cost Competitiveness

For Indian economy to exhibit a balanced, stable and sustainable growth it is highly imperative that Indian manufacturing, most importantly the segment comprising of small and medium enterprises (SMEs), to grow phenomenally primarily through improving its competitiveness in terms of costs and quality. In the emerging scenario of global competition, the need for enhancement of productivity and competitiveness of manufacturing enterprises need not be overemphasized. Robust growth in manufacturing is an imperative for creation of better employment possibilities and overall economic development.[8] Besides, competitiveness is central to robust growth of the manufacturing sector.[9]

One of the vital means of enhancing productivity and improving quality is through proper cost management. It is widely recognized that what Indian manufacturing needs the most today is improvement in cost competitiveness. Regarding cost competitiveness, Nakagawa (2008)[10] has observed, "it refers to the edge that the domestic manufacturers need to have in providing quality products at a certain cost". Many progressive organizations have adopted cost competitiveness as the central theme of business strategy. MUL (Maruti Udyog Ltd.) seeks to attain higher cost competitiveness through enhanced localization, higher productivity etc.[11] It is worth noting here that, regarding the challenges faced by Indian manufacturing in the emerging scenario, NSM (2004)[12] points out, inter alia, the following cardinal factors, (i) ensuring cost competitiveness and stimulating domestic demand, (ii) investing in innovations & technology, (iii) enabling SMEs to achieve competitiveness etc.

There are evidences for the declining competitiveness of Indian firms vis-à-vis their international counterparts in the LPG era. A study by *The Economic Times* (ET) in 2002 has revealed that the competitiveness of 202 Indian companies during FY 1997 to 2001 period has been constantly coming down, from 23.51 (FY 1997) to 20.92 (FY 2001). But, that of 42 MNCs (Multi-National Corporations) has gradually risen during the period, from 21.47 to 23.18. Gorden & Kato (2006)[13] have observed that the profitability of domestic manufacturing firms has been adversely affected with the increase in import penetration during the reforms regime (FY 1992 to FY 2002 period) and that this negative effect has been lesser in respect of firms with larger size..

Cost Management at KAMCO and Its Competiveness in the Industry

Major Financial Ratios of KAMCO : Declining Cost Competitiveness

Tables III to VI respectively show the major cost ratios, inventory management ratios, and profitability ratios of KAMCO. It may be noted that all cost ratios are showing an increasing trend which is not advisable. The only exception is Selling & Distribution (S&D) expenses to Sales ratio, which is very much under control and is gradually coming down also. But this cost element is relatively small and hence less significant compared to others (Table II & Figure I).In the case of inventory ratios, all ratios are moving downward, which is not advisable, the only exception being WIP inventory turnover ratios. In fact, an increasing trend shows effective inventory management and vice versa. Thus, like cost ratios, inventory turnover ratios also show an unfavorable trend (Table III& Figure II). Likewise, all profitability ratios also show a clearly declining trend (Table IV, Figure III), suggesting that KAMCO has to improve its profitability.

Financial Year	Staff Costs to Sales	Materials Consumed to Sales Ratio	S&D Expensesto to Sales Ratio	Conversion Cost Ratio	Total Costs to Total Income
FY 2002	12.28	63.52	7.59	14.63	87.25
FY 2003	11.41	57.61	6.75	18.71	86.14
FY 2004	14.25	59.85	7.47	22.99	89.40
FY 2005	16.03	63.84	1.26	23.17	90.83
FY 2006	16.87	69.48	1.44	20.88	90.62
FY 2007	15.84	62.43	1.30	19.66	90.17

Table II: Major Cost Ratios of KAMCO.
Source: Computed from *Annual Reports* of KAMCO, FY 2002 to 2007.]

Financial Year	Inv. T/O	R-Mtl. Inv. T/O	WIP Inv. T/O	FG Inv T/O
FY 2002	5.19	6.36	15.56	13.35
FY 2003	5.13	6.94	16.37	09.37
FY 2004	4.21	6.25	13.70	07.56
FY 2005	4.43	6.43	16.51	08.64
FY 2006	4.01	6.56	18.33	08.00
FY 2007	4.39	6.18	17.40	08.74

Table III: Major Inventory Turnover Ratios of KAMCO.
[Source: Computed from *Annual Reports* of KAMCO, FY 2002 to 2007.]

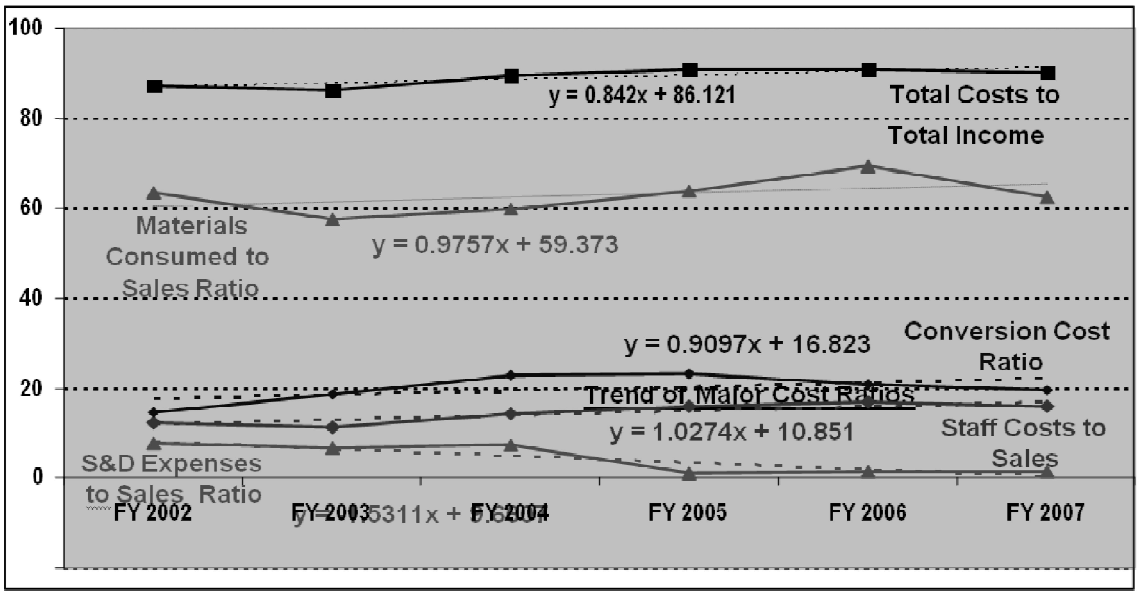

Figure I : Trend of Major Cost Ratios of KAMCO.

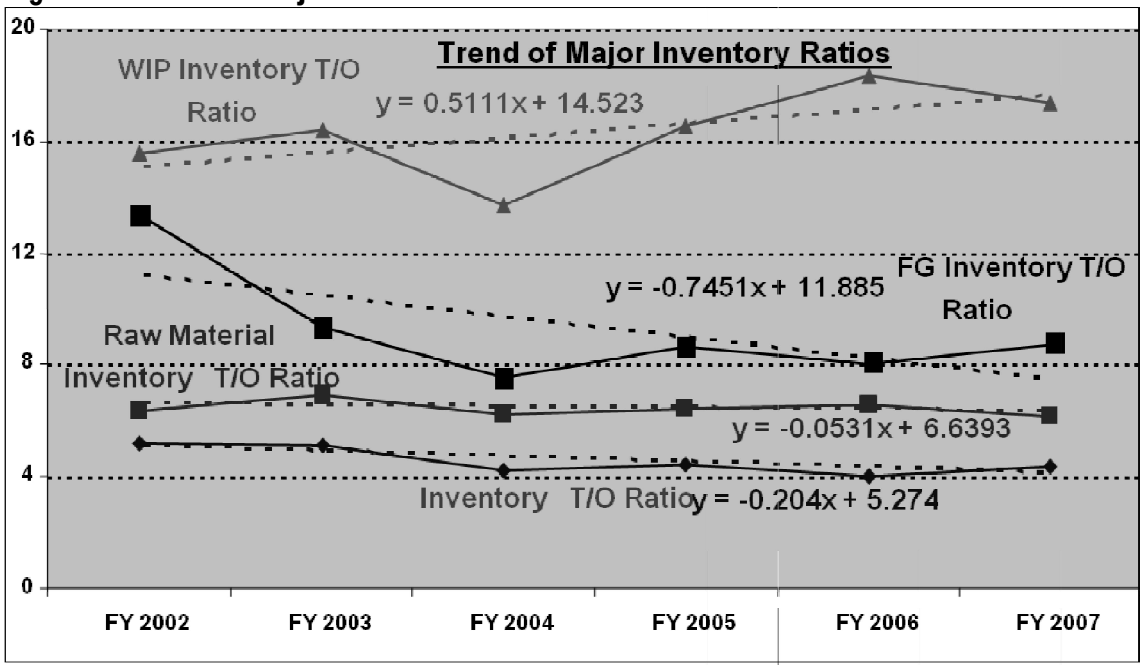

Figure II : Trend of Inventory Turnover Ratios of KAMCO

Financial Year	Net ProfitRatio	Operating Profit Ratio	EPS	ROI	Op. Profitto Cost
FY 2002	9.96	12.94	4.16	14.74	14.60
FY 2003	9.33	13.75	4.24	13.31	16.08
FY 2004	7.51	10.68	3.17	9.14	11.84
FY 2005	5.89	9.15	2.90	7.78	10.08
FY 2006	6.53	10.06	3.24	8.06	10.35
FY 2007	6.03	9.69	3.55	8.18	10.90

Table IV: Major Profitability Ratios of KAMCO.

[Source: Computed from *Annual Reports* of KAMCO, FY 2002 to 2007.]

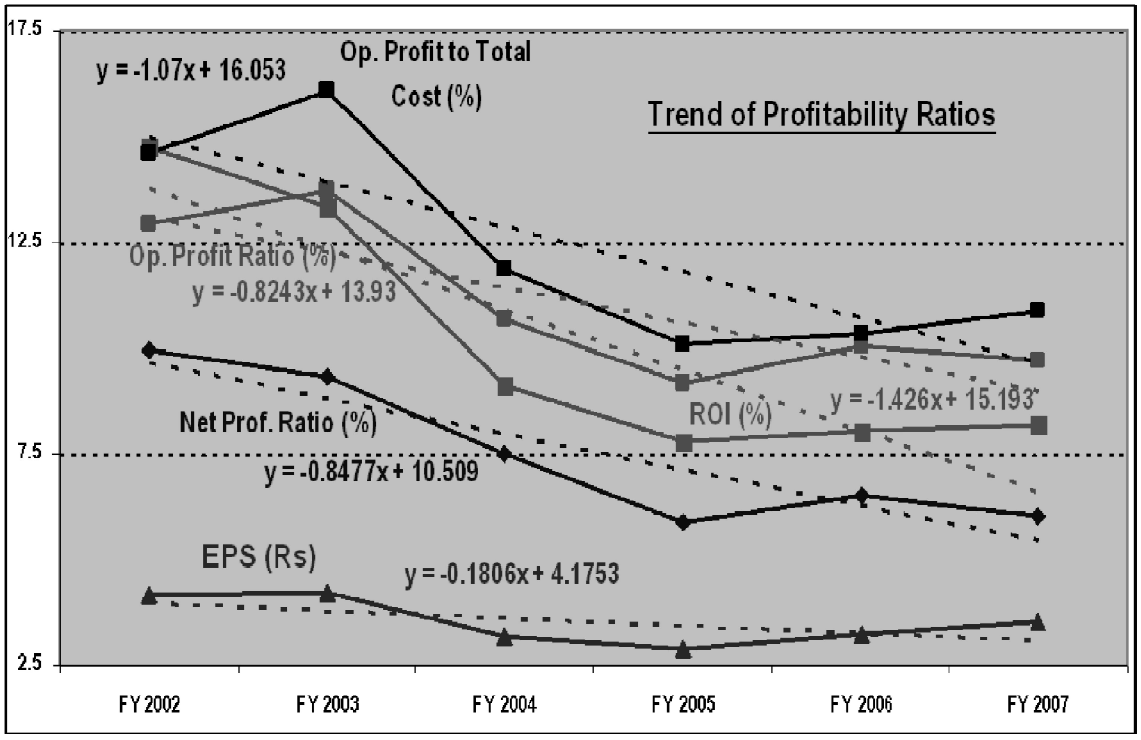

Figure III: Trend of Major Profitability Ratios of KAMCO.

Performance of KAMCO: Benchmarking with the Industry Players

Agricultural machinery and equipment have revolutionized the agricultural industry worldwide. In India, there has been reasonable growth in the sales turnover of the agro-machinery manufacturing companies. Though there are more than 50 companies, except for the largest 4 to 5 companies others have very small market shares (Table V). KAMCO is benchmarked with VST – the competitor firm and also the market leader at present.

Name of the company	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	Average
VST Tillers Tractors Ltd.	09.45	10.70	15.37	13.48	13.81	16.02	13.14
Tractors & Farm Equipments Ltd. (TAFE)	04.27	04.42	06.71	12.52	16.00	13.76	09.61
KAMCO	14.15	14.85	13.31	13.63	12.20	11.28	13.24
Aspee Agro Machinery Corp.	02.64	NA	03.35	04.01	03.66	03.39	02.84
Navayug Krishi Sadhan Pvt. Ltd.	02.23	01.85	01.81	02.86	03.53	03.27	02.59

Table V: Market Shares of the Largest Agro-Machinery Manufacturing Companies
[Source: Compiled from CMIE Database, *Industry: Market Size & Shares,* "Agricultural Machinery", April 2008, pp. 278-279.]

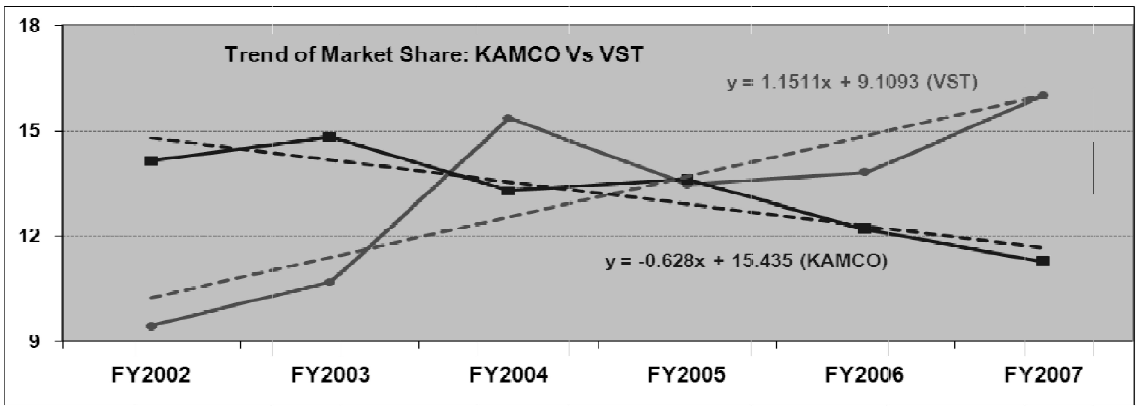

Figure IV: Market Shares of KAMCO Vs. VST (FY 2002–2007)

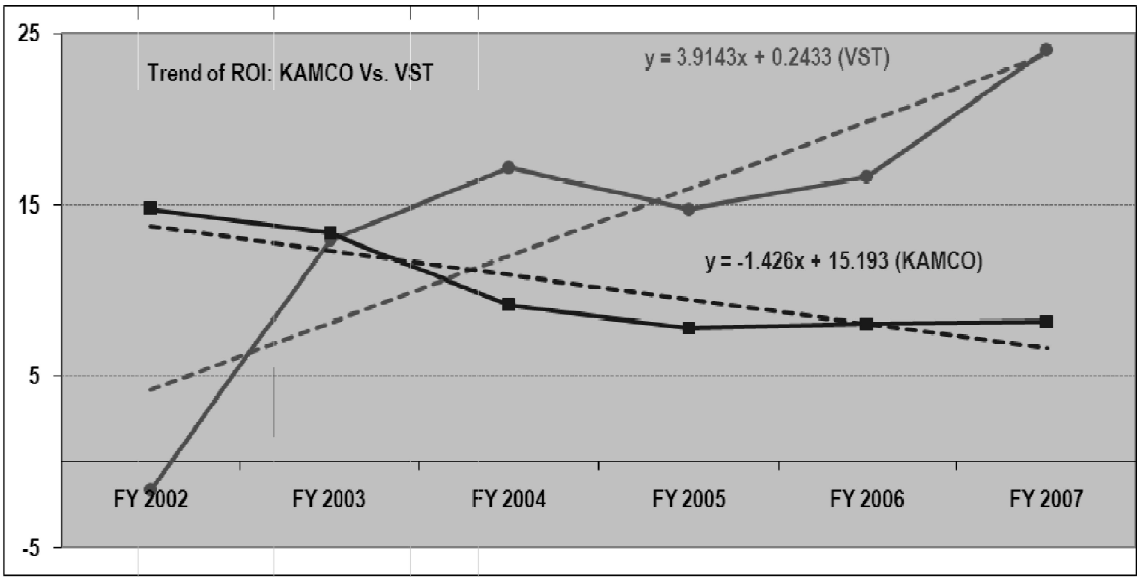

Figure V: ROI of KAMCO Vs. VST (FY 2002 – 2007)

Growth Rate (%)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Average
KAMCO	-0.94	08.87	-07.19	16.42	0.88	13.97	05.34
VST	-26.86	17.37	46.51	-0.57	14.46	25.38	12.72

Table VII: Sales Growth of KAMCO Vs. VST (FY 2001 – 2007)
[Source: Computed from Annual Reports of KAMCO (FY 2001–2007), CMIE Database]

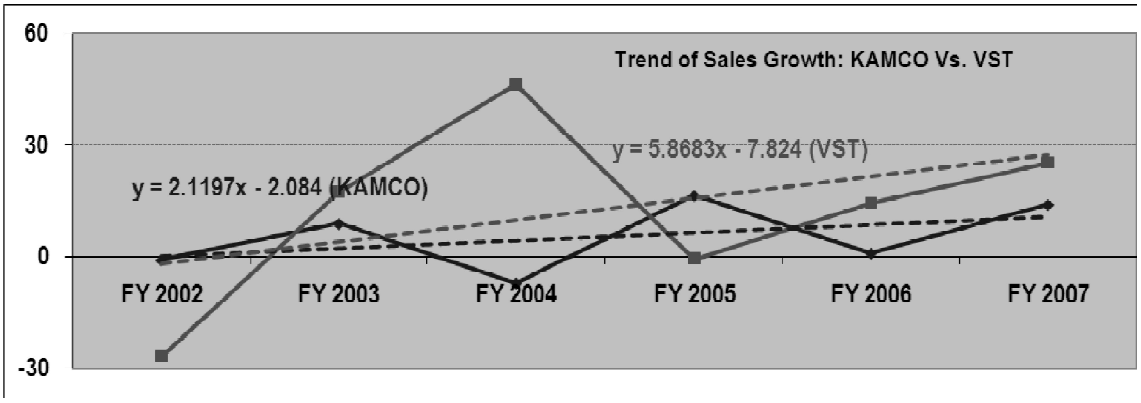

Figure VI: Sales Growth of KAMCO Vs. VST (FY 2001 – 2007)

As in the case of market share, in respect of Return on Investment (ROI) also there is a declining trend for KAMCO and an improving trend for VST. (Table VI, Figure V). Similarly, in the case of sales growth also VST is ahead of KAMCO. Besides, VST is growing much faster than KAMCO over the years. (Table VII, Figure VI).

Energy (Electricity) Management at KAMCO and Its Impact on Cost Competiveness

KAMCO has been closely controlling its electricity charges, by reducing its peak time consumption as well as through other energy saving measures. Peak time refers to 06 PM to 10 PM. Consumption during this time invites higher charges, as the PF (Power Factor) would be higher, and hence higher rate/ unit of electricity. If PF is less than 1 (say 0.98) rate will be lesser, if still lesser (say, 0.96) rate will come down further and so on. (Tables VIII and IX).

Earlier Practice	**Present Practice / Implications (Cost Savings)**
Shifts: (1) 07 AM–03 PM	Shift (1) 07 AM – 03 PM (as usual) and Shift (2): 11 AM–07 PM* [* and (2) 03 PM–11 PM Second shift is deliberately avoided using peak time 06 PM to 10 PM as much as possible. Only 01hour (ie. 6 PM–7 PM) is during the peak period.] This helps to avoid higher charges by improving (reducing) the PF values and hence savings in power charges. (Table XI shows the gradually improving PF, declining power charges and reduced power consumption per unit of Tiller).

Table VIII: Cost Advantage by Management of Electricity Charges.
[Source: Compiled by the Author based on Interview with the Principal Officers of KAMCO.]

Month	PF	Consumption of Power (KWh)	Total Bill (Rs)	Tillers Produced	Power Consumption /Tiller	
					Units (KWh)	Amount (Rs)
Apr 08	0.98	89754	419729-00	400	224	1049-32
May 08	0.97	98646	449315-00	432	228	1040-08
Jun 08	0.97	92610	407393-00	463	200	879-90
Jul 08	0.96	96084	483986-00	501	191	966-00
Aug 08	0.95	82530	464122-00	441	187	1052-43
Sep 08	0.94	64776	346060-00	402	161	860-00
Oct 08	0.94	56328	315189-00	409	137	770-63
Nov 08	0.94	52386	300466-00	471	111	637-00
Dec 08	0.94	48738	287308-00	501	97	573-47
Jan 09	0.94	59994	328376-00	423	142	776.30
Feb 09	0.92	45828	277224-00	450	102	616.05
Mar 09	0.95	54552	280758-00	510	107	550.51
Apr 09	0.91	41472	240923-00	381	109	632.34
May 09	0.93	50460	268516-00	439	115	611.65
Jun 09	0.92	58350	233748-00	486	120	480.96
Jul 09	0.90	55836	285998-00	567	98	504.41
Aug 09	0.93	44238	249157-00	471	94	529.00

Table IX: Pattern of Power Charges and its Impact on Per Unit Consumption.

[Source: Compiled by the Author from the Official Energy records of KAMCO.]

From Table IX and Figure VII to IX, it is noted that KAMCO's power factor and per unit electricity consumption, both in units (KWh) and amount (Rs) shows favourable trend. These are all showing a gradually declining trend which is good (Table IX and Figures VII, VIII and IX).

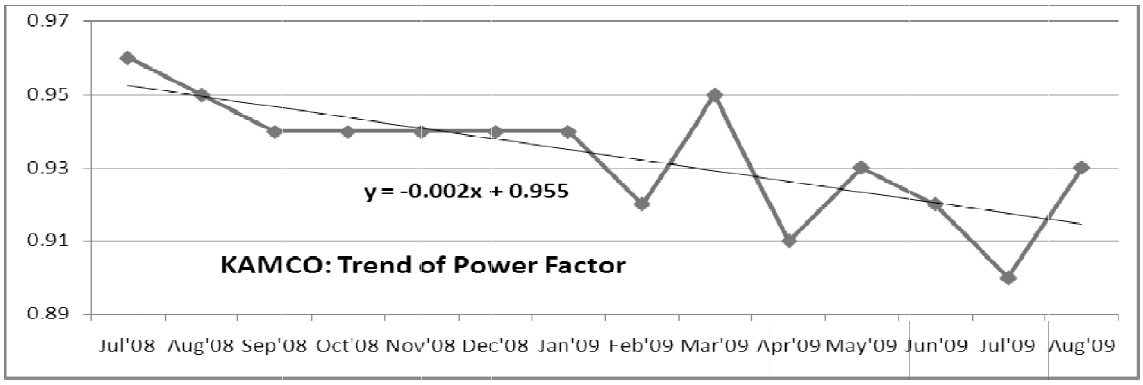

Figure VII: Trend of Power Factor of KAMCO (July '08 -Aug '09)

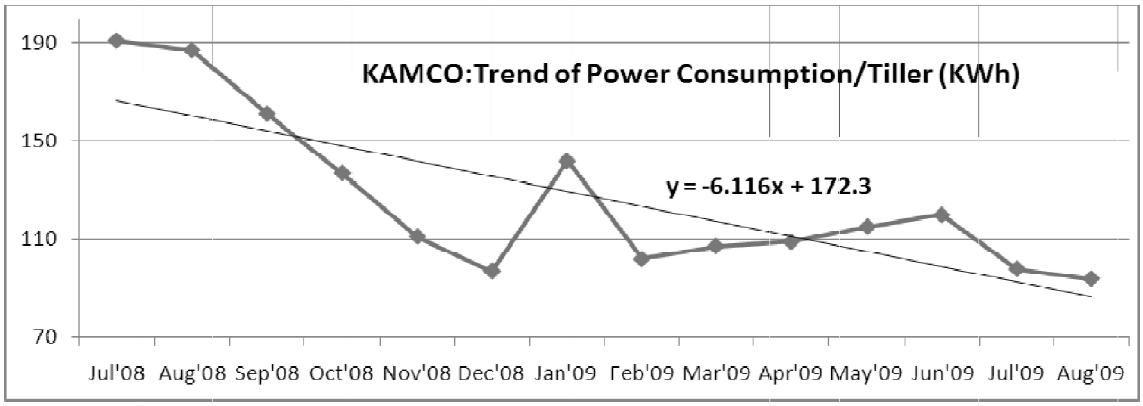

Figure VIII: Trend of Power Consumption/Tiller (KWh)of KAMCO (July '08 Aug '09)

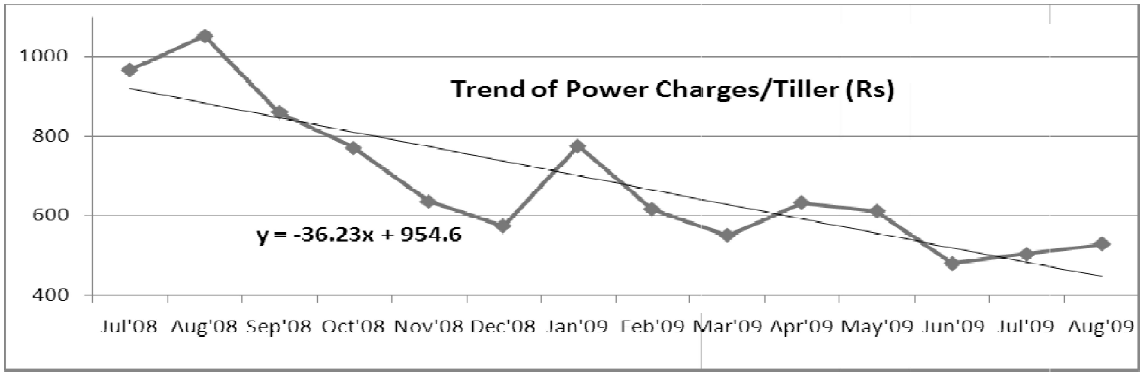

Figure IX: Trend of Power Charges / Tiller (Rs)of KAMCO (July '08 Aug '09)

Some Broad Strategies for Enhanced Cost Competitiveness of KAMCO

While it is observed that Energy cost (Electricity charges) of KAMCO is very much under control and is showing a favouarable declining trend, the general trends in respect of cost management, profitability, sales growth etc. are not advisable as already discussed in the foregoing sections. Because, KAMCO's profitability is significantly affected by cost pressures (Table II & Figure I). Of the various costs, material cost is the most important one – the one which significantly affects productivity of KAMCO. In short, for better performance and sustained growth, the company has to improve its competitiveness through cost management – particularly management of material costs. KAMCO being primarily into further processing and assembly of bought-out parts to produce final products, inventory management should be one of the areas wherein focused attention is required. It may be noted that there has been an unfavourable (declining) trend for inventory turnover ratios (Table III & Figure II).

Another point of concern for KAMCO is its falling market share (Table V & Figure IV) and slow pace of sales growth (Table VII & Figure VI). This in turn suggests that diversification of product portfolio may be essential for increasing sales and hence improving market share. Horizontal diversification (like, from Tillers at present to Tractors, Sprayers etc. also in the future) appears to be meaningful. Competitors have already diversified their product portfolio (eg. VST, TAFE). KAMCO has already lost its leadership position (as it was the industry leader earlier). Even the current position (second) may be lost unless suitable diversification strategies are adopted at the earliest (Table V).

In view of (i) falling market share (Table VI & Figure IV), (ii) falling profitability (Table V & Figure III), and also (iii) relatively slow sales growth (Table VIII & Figure VI) the strategies that KAMCO may adopt for enhancing its competitiveness in the industry and hence enabling its sustained growth, could be two broad grand strategies viz. (i) Strategies for enhanced cost competitiveness, and (ii) Diversification strategies for enhancing market share and sales revenue. Of these, among the strategies for cost competitiveness, the one in respect of energy (electricity charges) management is already being practiced by KAMCO and is showing favouarble results. This needs to be continued for sustained cost competitiveness. But, there are a number of other areas which need immediate attention. These are briefly discussed below.

- ***JIT (Just-in-Time) Production System***: For such an endeavour to be implemented successfully, KAMCO should ensure the following pre-requisites before implementation (these being observed to be

critical success factors) (Mahadevan, 1997)[15]: (i) supplier development, (ii) employee involvement, and (iii) top management commitment. Besides, a meticulous strategic planning may be required prior to any major JIT initiative as above, for success (Mahadevan, 1997)[16]. Effective JIT implementation can bring about such benefits as (in the descending order of importance) (i) increased productivity, (ii) increased profit margin, (iii) improved competitive position, (iv) quality improvement, and (v) reduction in inventory. (Chandra, 1998)[17]. Typically, three years' lead time is required for JIT implementation[18].

- ***Target costing (TC) for Enhanced Competitiveness***: Wherever the total cost of internal manufacture of the parts is higher than market price of these parts, based on a TC approach tighter control of overhead costs could bring down the processing costs substantially so that the total costs (material cost and overhead) is below the market price. Accordingly, the company can maintain cost competitiveness with the market in internal production. KAMCO's previous experience has shown that overheads are controllable to the extent of about 30%, mostly through savings in overheads like indirect labour charges, indirect supervision charges etc. Certain overheads like fuel consumables, however, are not amenable for cost control. Thus, wherever feasible TC is quite advisable.

- ***Outsourcing***: Wherever, target costing as mentioned in the above paragraph is not a feasible proposition because of the nature of the overhead costs, then it would be better to outsource such components or parts from the open market. However, in case of outsourcing, there should be provision for re-deploying the surplus labour if any. This in turn requires advance strategic planning.

- ***Other Complementary Strategies:*** These are quite desirable along with strategies like JIT and include, inter alia, (i) Lean Production system, (ii) *Kanban* (continual improvement), (iii) TPS (Toyota Production System) approach, (iv) Six Sigma, (v) TQM etc. etc.

Concluding Remarks:

In view of the foregoing analysis, it may be stated that because of the cut-throat competition in the industry in the wake globalization pressures, and also the recessionary situation that is persisting in the economy since FY 2006, meticulously planned and well articulated cost management strategies have become an imperative for survival and growth for any manufacturing company. For a PSU (Govt. of Kerala) like KAMCO in particular, competition from private players like VST and TAFE will increasingly pose threat in the days to come.

Though KAMCO could sustain its competitiveness and productivity in certain areas (like, for example energy management), there are other areas which need immediate attention. These include closer management of material and other costs, through JIT and such other modern strategic cost management practices. Another area is that of enhanced sales through product diversification. It may be stated that in spite of having all its handicaps of being a PSU, KAMCO has got all the requisite potentialities to come up and excel. This is evident from the formidable resilience of the company over the years, profit making track record and reasonable sales growth. KAMCO's cost management department is closely monitoring its profitability and is facilitating appropriate policy decisions for enhanced competitiveness and profitability. By adopting more competitive strategies (like, the one which has already been adopted successfully by the company in respect of energy management), KAMCO has further improve its position and regain its leadership position.

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