8 CONCLUSIONS & SCOPE FOR FUTURE WORK

8.1 CONCLUSIONS

It has been observed through this research that the firms and their supply chain partners must work together in synergy to gain competitive advantage. Earlier, very limited research has been reported in this direction which motivated me to select the objectives in an integrated approach that would bring benefits to all the firms along the supply chain.

In the present research, ODP, C2C cycle time and shareholder facing performance measures have been analyzed by collecting data from annual reports and SCM division of ARBL. In optimizing ODP, a NLP model is formulated and solved by dynamic programming approach to provide benchmark values for elemental performances.

After analyzing the ODP of ARBL supply chain in an integrated approach, it is found that the supply chain has improved its performance from “Major Opportunity” class (i.e., mean ODP = 0.3834 in FY: 2004 – 05) to “Advantage” class
(mean ODP = 0.6564 in FY: 2009 – 10). The fluctuations in ODP in the past three years indicate that the firm ARBL didn’t attempt to measure the performance in an integrated approach. However, the performances of entities have been improved significantly in the past five years in achieving better ODP.

Through benchmarking the expected performances from trading partners, there is scope for ARBL supply chain to improve its performance to “Best-in-Class” level in forthcoming years. The efforts of the company are in the same direction towards implementing performance measures strictly to improve ODP. The firm ARBL is strengthening its relationship with its trading partners to build more trusted, cooperative and collaborative environment to share information on demand and sales.

In working capital management, the objective of present research is to find optimal payment and collection periods that would minimize penalty to a firm, its supplier(s) and distributor(s) and also minimizing C2C cycle time. The LP model developed and solved using TORA has provided most promising results that leads to improved working capital management. The results of sensitivity analysis on payment deferral period provides basis for benchmarking payment and collection periods among trading partners upstream and downstream along the supply chain. The results clearly indicate that shorter payment deferral period and inventory days leads to shorter C2C cycle time as well as minimum penalty to overall supply chain.
It is evident that the firm ARBL has not evaluated its C2C cycle time and penalty associated with existing practice of payment and collections.

Earlier, in the year 2000–01, for a deferral period of 3 days, the penalty was 11.46 million rupees. In the present analysis, the penalty for same deferral period is 2.26 million rupees (for $T_c = 17$ days, $T_p = 14$ days and deferral period 3 days) Similarly, the maximum penalty is Rs: 32.5 million (for $T_c = 40$ days, $T_p = 35$ days and deferral period 5 days) in the year 2007–08 against a deferral period of 23 days associated with a penalty of Rs: 46.38 million in that year. Even negative deferral period (in the year 2005–06) resulted in higher penalty to the supply chain. Hence, it is necessary to have a mechanism as presented in this thesis to find optimal combination of payment and collection periods as well as the payment deferral period associated with minimum penalty to the trading partners.

The methodology presented in this thesis helped the focal firm to find optimal payment and collection periods for benchmarking while negotiating with the trading partners to minimize total penalty in an integrated approach.

From inventory management point of view, the firm ARBL is constantly monitoring inventory levels to reduce the inventory days of supply that would not affect its supply chain responsiveness. At the same time it is trying to improve its
ITR that would decrease its C2C cycle time as well as enabling efficient working capital management. As a result of CPI projects in IBD of ARBL (through adoption of VMI strategy, lean and six-sigma programs), the ITR of IBD has improved with a steady growth rate from 6.42 to 15.0 (annual average performance from 2004 – 05 to 2008 – 09). The inventory days of IBD has decreased from an average of 57 days (in 2004 – 05) to an average of 25 days (in 2008 – 09). This clearly indicates improved inventory management in IBD. The firm ARBL should plan to reduce its inventory days to improve both inventory management and cash conversion cycle time by concentrating on improving ITR of the entire supply chain.

The overall performance of the firm from shareholder’s perspective is also improving in the successive years (the performance in the year 2008 – 09 has slightly come down due to recession) but still there is scope for rate of growth in each of the financial metrics hopefully high in the forthcoming financial years. The firm is building stronger links with its supply chain partners to be competitive in the same industry sector.

The financial management of an integrated supply chain will be more effective only when the chain members try to identify where the money is accumulated or which company along the chain is getting more benefit than the others by taking advantage of credit period. Then the firms should try to go for such financial /
strategic decisions which will disseminate the benefits to all the firms along the supply chain to strengthen their trading partners with positive spillovers.

Generally, industrialists may not accept the philosophy of shared vision, disbursement of surplus among trading partners, working for the benefit of all the chain members. But as the supply chains become complex, the firms must strive to build trust, mutual understanding, cooperation, coordination of business activities, collaborative planning etc., which are core and essential practices for effective supply chain management. It is the responsibility of the focal firms which commands the business activities of its trading partners to work for the benefit of all. Once this has been achieved, maintaining supply chain relationships in the long run would become easier and the links of the chain become stronger and stronger in successive years enough to compete with their competitor’s supply chain.

8.2 SCOPE FOR FUTURE WORK

In this research, an attempt is made to develop mathematical models to assess ODP of a supply chain in an integrated approach considering all the responsible elements in the delivery process. The models developed for assessing delivery performance and benchmarking will help firms during formulation of strategic alliances with trading partners. The methodology presented for benchmarking is
based ontrailvalues of costs associated with delivery performance as well as penalty associated with failure of maintaining expected level of performance. If the exact data is available on delivery related supply chain management costs, more insights on cost based performance improvement can be drawn.

Learning index can also be used as a benchmark if companies maintain relevant data. This will provide a basis for identifying the potentialities of trading partners to spot the “weak link” and take necessary decisions to strengthen the chain because “a supply chain is as strong as its weakest link”. There is wide scope to develop models for benchmarking through assessing learning index for each entity (supplier, warehouse, 3PL provider) and also the overall learning rate in an integrated set up.

In working capital management area, the scope of present research is limited to a single-echelon supply chain in minimizing penalty to trading partners by finding optimal payment and collection periods. The methodology to optimize payment deferral period has provided satisfactory results providing basis for benchmarking payment and collection periods with trading partners. The calculation of ITR and studying its impact on C2C cycle time is limited to analysis of ITR of IBD and discussion on means of improving ITR of ARBL supply chain as a whole. If cross-border inventory data is available this metric will be helpful to assess integrated ITR of the supply chain. This will help in optimizing the inventory days of supply
maintained at each level in the supply chain as is demanded to maintain required supply chain flexibility. There is wide scope to develop model in an integrated approach to find the ITR levels at each stage to optimize inventory carrying costs, improve C2C cycle time and achieve optimal supply chain reliability and flexibility to meet changing customer requirements.

In shareholder facing performance measurement, the scope of present research is limited to develop a frame work to assess the performance of overall supply chain from shareholders’ perspective. The methodology and calculated ratios will provide insight to top-management about the impact of renovation and supply chain management practice in the firm. There is scope for supply chain partners to assess individual performances from shareholders’ perspective and compare the ratios to find out which trading partner is effective in maintaining material and fund flow across the boundary of their firm.