



STRENGTHENING ENTERPRISE COMPETITIVENESS BY SYNCHRONIZING SUPPLY CHAIN

Rimvydas Jasinavičius¹, Nerius Jasinavičius²

¹Mykolas Romeris University, Ateities g. 20, LT-08303 Vilnius, Lithuania

²UAB „TOC sprendimai“, Totorių g. 30-3, LT-01121 Vilnius, Lithuania

E-mails: ¹rimjas@mail.lt (corresponding author); ²nerius@toc.lt

Received 26 November 2010; accepted 26 February 2011

Abstract. When competition is fierce and many producers try to create a competitive advantage by lowering prices, price wars are very common, but only few survive. Low prices erode producers' margins and economic viability of the company. Low prices are very short-lived competitive advantage as it can be easily imitated by other competitors. Only producers with big economies of scale and low labour costs can afford very low sales prices. Eastern European producers have neither economies of scale nor low labour costs (comparing to Far East producers). This paper provides theoretical background and practical experience of how three Eastern European textile producers created significant competitive edge, which enabled them to increase their customer base more than three times. Profitability has increased by 4 times, and net-profit by 5 times.

Keywords: supply chain, competitive advantage, textile producer, customer need, competitive advantage, LEAN, TOC, theory of constraints.

JEL Classification: M16.

ĮMONIŲ KONKURENCINGUMO STIPRINIMAS SINCHRONIZUOJANT TIEKIMO GRANDINĘ

Rimvydas Jasinavičius¹, Nerius Jasinavičius²

¹Mykolo Romerio universitetas, Ateities g. 20, LT-08303 Vilnius, Lietuva

²UAB „TOC sprendimai“, Totorių g. 30-3, LT-01121 Vilnius, Lietuva

El. paštas: ¹rimjas@mail.lt; ²nerius@toc.lt

Įteikta 2010-11-26; priimta 2011-02-26

Santrauka. Esant didelei konkurencijai daugelis gamintojų stengiasi sukurti konkurencinį pranašumą mažindami kainas, ir kainų karai yra labai dažnai pasitaikantis reiškinys. Mažos kainos griauna gamintojų pelningumą ir ekonominį įmonės gyvybingumą. Mažos kainos yra trumpalaikis konkurencinis pranašumas, be to, jis gali būti lengvai nukopijuotas kitų įmonių. Tik gamintojai su didele masto ekonomija ir mažomis darbo jėgos sąnaudomis gali leisti sau pardavinėti mažomis kainomis. Rytų Europos gamintojai neturi nei masto ekonomijos, nei mažų darbo jėgos sąnaudų (palyginti su Tolimųjų Rytų gamintojais). Šiame straipsnyje pateikiamos teorinės prielaidos ir praktinė patirtis apie tai, kaip trys Rytų Europos tekstilės gamintojai sukūrė reikšmingą konkurencinį pranašumą, leidusį jiems padidinti klientų bazę daugiau nei tris kartus. Pelningumas padidėjo keturis kartus, o grynasis pelnas – penkis kartus.

Reikšminiai žodžiai: tiekimo grandinė, konkurencinis pranašumas, tekstilės gamintojai, klientų poreikiai, LEAN, TOC, apribojimų teorija.

1. Introduction

In recent years low-cost textile producers from China, India, Vietnam and other Far East countries pushed Europe's manufactures from the market. Attempts to counter this competition by reducing prices were unsuccessful due to significantly smaller production scale and high labour costs. But despite those bad conditions company has a need for growth (Collins 2001) and stability (Collins, Porras 1994). Therefore it is very interesting to analyse experience of those producers from Lithuania and other Eastern European countries, which succeeded in this fierce competition without reducing prices for their goods.

When supply of the products (of some kind) is big, then competition among suppliers becomes tighter. It is not unusual for producers to offer lower prices for their goods to distributors and/or retailers. Although this way of competing may seem easy and attractive from distributors or retailers point of view, but it is dangerous for producers.

First, by reducing sales prices producer reduces added value generated and as a result reduces profitability. Lower profitability reduces return on investment, as well makes future investment in new production equipment and in new product development more difficult. When sales price is lowered to or below Variable Costs, then economic activity of producer becomes meaningless and survival is impossible (Goldratt 1999c).

Second, lower prices as competitive advantage is short-lived – till the moment when competitor reduces the price (Goldratt 1994). And this can lead to price war. In the price war only the consumer wins and all the producers loose. Some of producers even get bankrupt.

In the book 'Blue Ocean Strategy' (Kim, Mauborgne 2005), the authors contend that it is not possible, in most cases, to sell more of your existing products in your existing markets. They lay out a process for developing new products for new markets—a highly risky endeavor.

Therefore in fierce competition it is very essential to use several ways in creating decisive competitive advantage (Goldratt 2008c). Dr. E. Goldratt, the creator of Theory of Constraints (TOC), suggested that the way to have a decisive competitive edge is to satisfy a client's significant need to an extent that no significant competitor can (Goldratt 2008a, 2008b). Building a decisive competitive edge is not easy; building the capabilities to capitalize on it is not less difficult. But, sustaining these two elements is the real challenge.

2. Analysis of client's significant needs

Before analysing client's significant needs we need to describe who a client of the Eastern European textile producer is. We can look at final user of the product as a client. If final consumer does not buy the product, then producer will not be able to sell any of its goods. But none of the Eastern European producers sell directly to the final user. All producers sell through intermediaries, such as distributors and retailers (Fig. 1). Therefore we have to look into needs of producers' immediate client – distributors and retail chains (Goldratt 1999d). In order for producer to ensure sales of its products, producer has to place products on the shelves in retail. Therefore successful producers analysed significant needs of retail chains, and changed their way of operating to satisfy those needs.

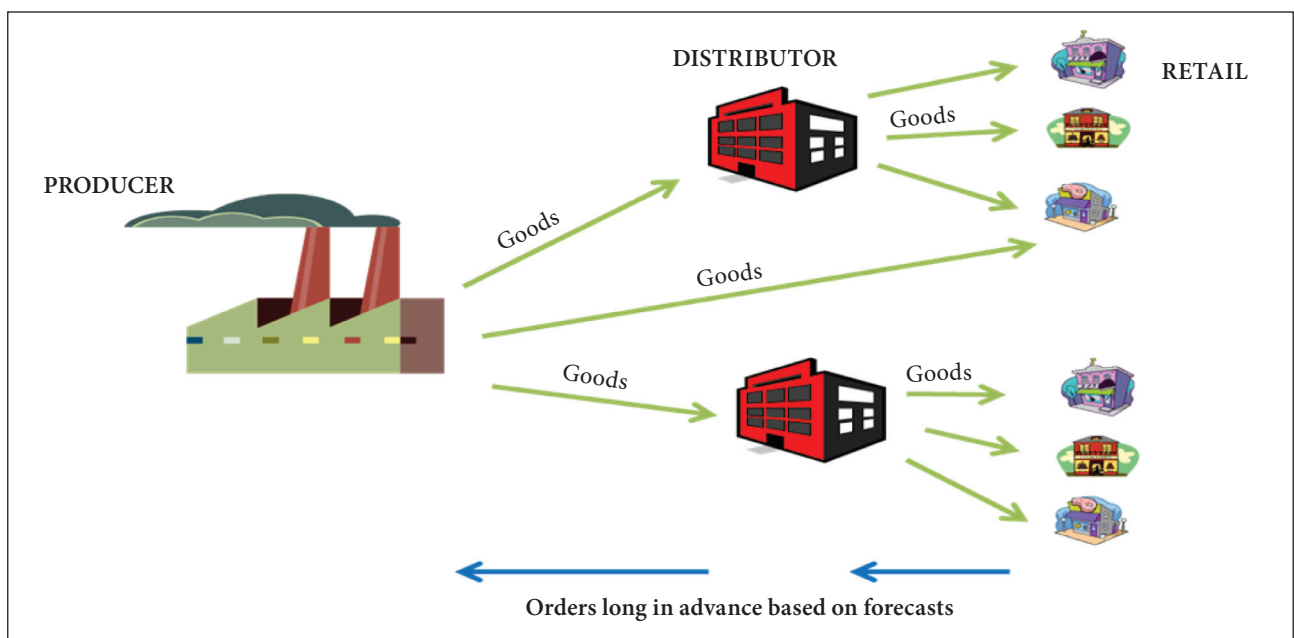


Fig. 1. Typical supply chain of textile products

Retail chains make their business reselling goods of the different producers. In order to sell products they have to be available on the shelves, as typical buyer will not wait for garment or other textile product to be delivered in several days. In order to ensure availability, retail chains have to hold big amount of stocks in their shops and regional warehouses or distribution centres. But garments and many other textile products are very sensitive to seasonality and their shelf-life (for how long retailer can expect product to be in demand) is not very long. Typically, season for garments and other textile products is 3–6 months. After that period producers launch 'New Collections' to the market and goods from previous collections become obsolete or out-dated, although physically products are good to use. If product is not sold during the season, retailer will have to sell it at discounted price without any profit or even at a loss. As well, main investments of retailers usually are in the inventory of the goods, therefore retailers are always fighting to improve inventory turns.

Therefore any retailer is faced with the dilemma (Fig. 2). On the one hand retailer has to hold big amount of goods in order to ensure availability and sales of the products. But at the same time high levels of inventory reduce retailers available cash, increase costs of warehousing and dramatically increase risk to be left with outdated goods, which will have to be sold without profit.

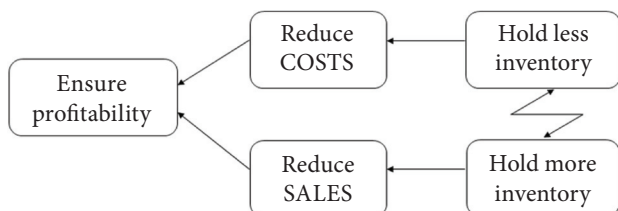


Fig. 2. Retailers' dilemma

A research study (Gruen, Corsten 2007) conducted by Thomas W. Gruen, Ph.D., University of Colorado at Colorado Springs, USA and Dr. Daniel Corsten, IE Business School Madrid have found that average level of out-of-stock (OOS) in European retailer is 8.6% and is bigger than in USA or other regions (Fig. 3). As well, logic says that products missing on the shelves are the ones selling, otherwise they still would be in the shops. Retailers are faced with serious amount of lost sales and irritated customers who were not able to find the most popular products in the shop.

In the same paper consumer responses to OOS events were presented and results show that in more than half cases customers do not make purchase in the shop (Fig. 4). Therefore belief that OOS causes lost sales for retailer is true.

Other negative effect of inventory management, i.e. overstock is well known. End-of-the-season sales is a very common practice.

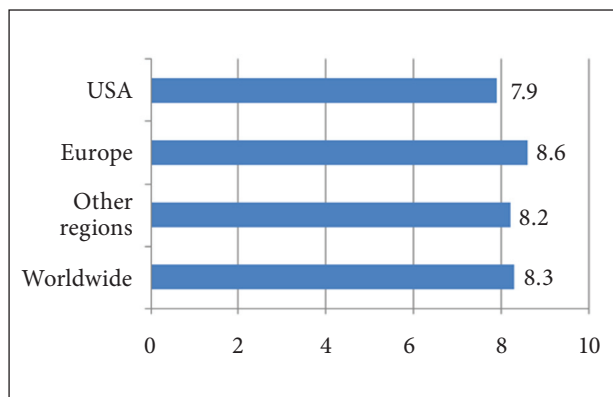


Fig. 3. Overall OOS extent (averages)

In the same paper consumer responses to OOS events were presented and results show that in more than half cases customers do not make purchase in the shop (Fig. 4). Therefore belief that OOS causes lost sales for retailer is true.

Other negative effect of inventory management, i.e. overstock is well known. End-of-the-season sales is a very common practice.

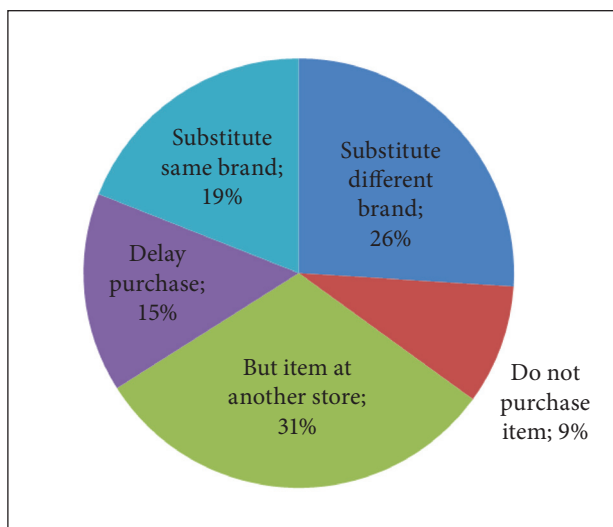


Fig. 4. Worldwide consumer responses to OOS

We can conclude that despite the fact that most of retailers' cash is tied up in inventory, availability is still an issue. So improving inventory turns and improving availability is a client's significant need.

3. Analysis of the competitors

Textile producers from China, India, Vietnam and other Far East countries, despite advantages of very low labour costs, are located quite remotely from European market.

That way transportation from producers to retailers becomes an issue. Airfreight is quite expensive compared to cost of the products. Most common way of transportation is by sea. Transporting goods from Far East to Europe by sea usually takes from 5 to 7 weeks.

As it was mentioned above, textile products are very dependable on the season, therefore it is necessary to have products in the shops before the start of the season. And most of the time all quantities for the whole season have to be ordered in advance, because with long replenishment time (5–7 weeks) and short duration of the season (typically 3 months) it is impossible to replenish within the season.

Long transportation and replenishment times and short season force retailers to order all merchandise much in advance before the season. Retailers have to make sales forecasts for each item they are planning to hold in stock. Although their general forecast is satisfactory, but forecast on each item is nothing more than educated guess.

Just before the start of the season retailer has almost 100% availability. But when the season starts with real sales, only then retailer gets real data on the sales and customers preferences. Products for which forecasts were too pessimistic are sold out much faster and retailer faces Out-Of-Stock with all negative ramifications discussed in an earlier chapter. But if the forecasts for some other products were too optimistic, so retailer is holding too much of that merchandise.

One of the core reasons for retailers problems is long replenishment lead time. Long transportation time makes replenishing of goods within the season almost impossible, therefore forcing retailers to depend on forecasts which cannot be accurate on product level.

4. Building a decisive competitive edge

As discussed in previous chapters, textile producers' clients (retailers) have very significant need to improve their inventory turns improving availability at the same time. As well, we found out that one of the core reasons for low inventory turns and bad availability is long transportation time. But long transportation time is necessary only for Far East producers. Eastern European producers are located very close to European retailers, therefore transportation time can be reduced drastically. It should be stressed out, that short transportation time is not the only factor influencing long replenishment time.

Let us look into replenishment time. Why replenishment time is so important. Replenishment time is the key factor in deciding on safe level of stocks to be hold in point of sale. Point of sale should order amount, which equals to maximum forecasted sales within replenishment period. Possible variation of replenishment should be taken into account. Replenishment time is period sales of 1 piece of product and the moment new replacing item is received.

Therefore replenishment time consists of:

- order lead time (from sale to making an order for replenishment);
- production lead time;
- transportation lead time.

Local producers have an advantage of short transportation time, but it is not enough in order to provide excellent service to the clients, i.e. helping retailers to increase inventory turns and improve availability at the same time.

Production lead time can be very significant, so local producers have to shorten production lead times as well. There is a very common practice in production to produce in very big batches. This makes order lead time and production lead times be substantial (Goldratt, Fox 1986).

Authors of this paper have worked with three textile producers: carpet producer from Moldova, home textile producer from Lithuania and women's apparel producer from Ukraine. With the advice and active participation of the authors those companies improved their production by implementing Theory of Constraint (Goldratt 1990) and LEAN manufacturing methodologies. That enabled those companies to produce in small batches and very fast without increasing their production costs (Ohno 1988). Implementation of Simplified Drum-Buffer-Rope¹ (Goldratt, Cox 2003) and Dynamic Buffer Management² enabled producers to hold in their warehouses relatively low level of stocks, but ensuring 99.5% of availability.

The first step, producers switched from a mode of operation of producing to stock into the mode of producing to availability (Goldratt 2009b) (produce only to the inventory targets that ensure availability):

- Per SKU, the target level of inventory that ensures high availability were set. Target level equals to the amount expected to be consumed within the replenishment time factored for variability in demand and supply.
- The replenishment time to the plant warehouse is equal to the production lead time.
- In conventionally run plants the eagerness to reach full activation of resources populates the shop floor with too many orders. The resulting traffic jams inflate the production lead time and mask capacity (Goldratt, E. M.; Goldratt, R. 2003b). In cases where the touch time is a very small fraction (<10%) of the lead time, vast experience shows (except for environments which

¹ S-DBR or Simplified Drum-Buffer-Rope – The process of managing operations based upon a shipping buffer, a market drum and secondary attention to any capacity constrained resources. Usage: S-DBR can be used in a production system when the market is the constraint. It only uses one type of buffer, namely, the shipping buffer (Sullivan *et al.* 2007).

² DBM or Dynamic Buffer Management – The algorithms for recommending changing the target levels which are based on certain behaviour patterns of the finished-goods stock (Sullivan *et al.* 2007).

are dominated by heavily dependent set-up matrixes) that abolishing the mentality of striving for high local efficiencies, reduces the lead time (to be less than 50% of the historical lead-times) and exposes ample excess capacity (~50%) (Goldratt 1999a).

Touch time of most textile products is counted in minutes, therefore producers were able to shorten their production lead times. Employing Lean techniques (Womack, Jones 2003) enhanced with TOC by E. Goldratt, companies reduced their lead times more than twice (Goldratt 2009a).

After ensuring that producers always have in their warehouses enough inventory to satisfy immediately any reasonable demand, next step of supply chain synchronization can be taken – synchronizing supply to shops according to actual demand.

The fact, that producers have all the merchandize available in factory warehouse makes one part of replenishment time to shops (production lead time) equal to zero. As mentioned before, another part of the replenishment time is order lead time, i.e. time period from selling the item to ordering its replenishment. It is very important to shorten this part as well.

It is quite a common practice in retail to order replenishment of textile products once a month and after that not to replenish at all, because typical replenishment time (from Far East) is too long. But with local producers holding finished goods inventory in factory warehouse (or in Regional Warehouse) it becomes possible to replenish very fast (Goldratt, E. M.; Goldratt, R. 2003a, 2003c; Goldratt 1999b). However, shortening order lead time required changes from retailers as well. They had to change their ordering practice. It took some time to convince retailers to provide producers with daily sales instead of purchase orders once in a while (Fig. 5). But this change was a clear win for retailer as it enabled significant increase in inventory turns and improvement in product availability (Goldratt *et al.* 2000).

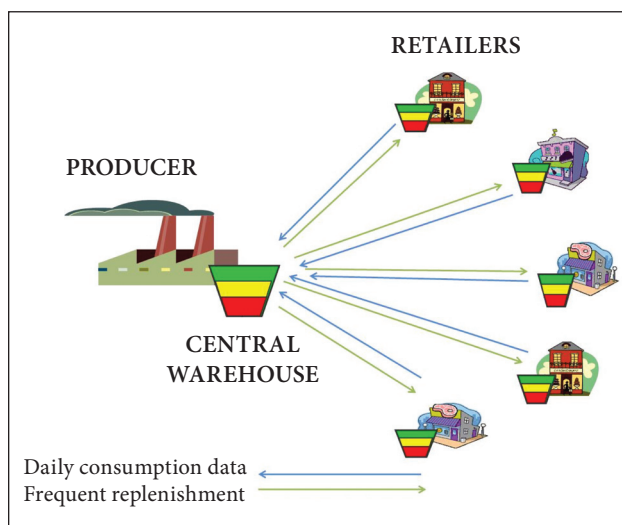


Fig. 5. New synchronized supply chain of textile products

As any retailers have very limited storage and display space, therefore reduction in inventory levels made expansion of assortment possible which added to an increase in sales. As a result, sales of that product group increased from 15% to 30%, and in some cases even by 50%, while average inventory level for those products decreased 2–2.5 times.

5. Results

Results achieved were very significant. As sales and profit information on specific markets is very sensitive, therefore some absolute numbers of some companies will not be disclosed.

Results of Moldavian producer’s sales in Export Market (EU country) are presented in Fig. 6. Supply chain synchronization project started in June 2006. Although this market was not new for the producer, but previous years were not very successful.

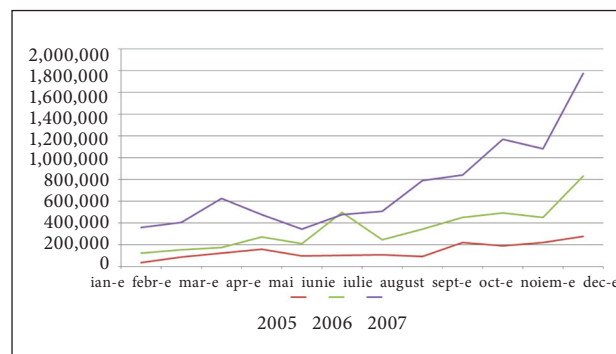


Fig. 6. Sales year-to-year in Export Market

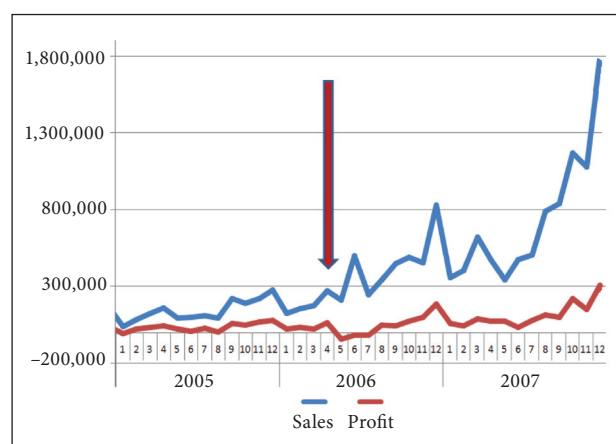


Fig. 7. Monthly sales and profit in Export Market

Results of Lithuanian home textile producer’s sales in Export Market (EU countries) are presented in Figs. 8, 9 and 10. Progress is shown from the first month of Supply chain synchronization project.

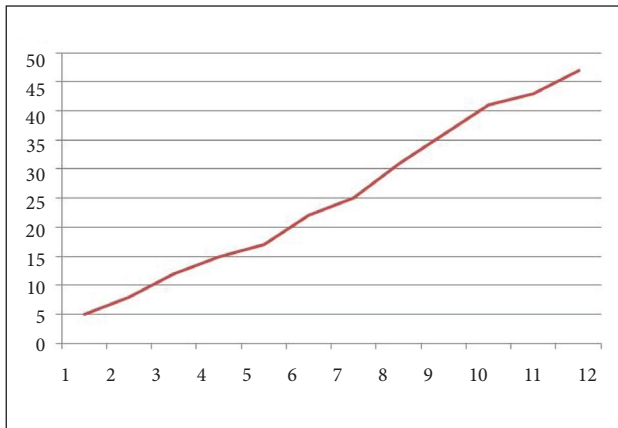


Fig. 8. Number of major Points of Sale (retail shops) supplied

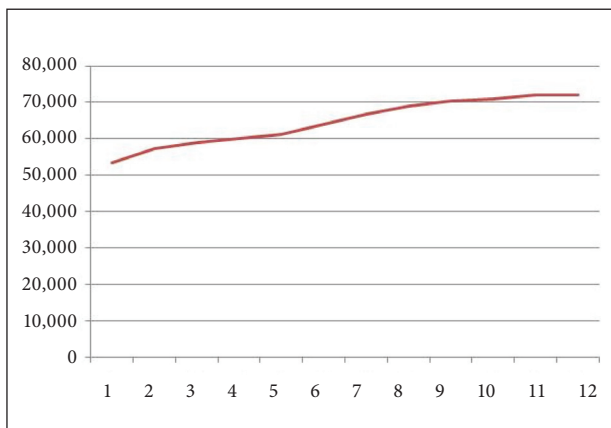


Fig. 9. Average sale of POS

Results of Ukrainian women's apparel producer's sales in home market are presented in Fig. 7. Progress is shown from the first month of Supply chain synchronization project.

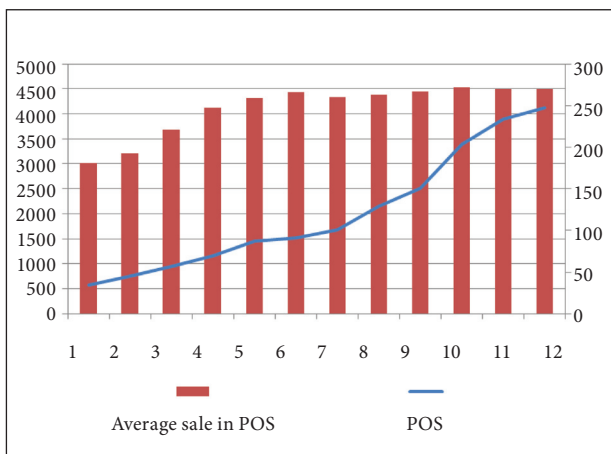


Fig. 10. Changes in number of Points of Sale (retail shops) supplied and average sale in per POS

6. Conclusions

1. Competing with textile producers from Far East by lowering the prices is a very dangerous path for Eastern European textile producers as it reduces profitability and economic viability of the company. And price as competitive edge is very short-lived and easily copied by competitors.
2. Much better way for creating competitive edge is by satisfying client's significant need to an extent that no other significant competitor can.
3. By capitalizing on geographical proximity to the retailers, and on ability to produce in small batches, Eastern European textile producers can synchronize supply chain in order to ensure availability of merchandize on the shelves in retail and reduce amount of slow movers in stock of retailers.
4. By advice and with the direct participation of the authors of this paper, three producers of textile products from Lithuania, Moldova and Ukraine implemented supply chain synchronization according to Theory of Constraints and LEAN manufacturing principles.
5. All those producers within a period of 12–18 months created significant competitive edge and experienced increase in customer base more than 3 times. Their sales in target markets increased more than 4 times with profitability jumping above 5 times.
6. All the implementation did not require significant investment, therefore producers experienced significant increase in net profit by 50% to 120%.

References

- Collins, J. 2001. *Good to Great: Why Some Companies Make the Leap... And Others Don't*. New York: HarperCollins Publishers, Inc.
- Collins, J. C.; Porras, J. I. 1994. *Built to Last: Successful Habits of Visionary Companies*. New York: Harper Business.
- Goldratt, E. M. 1990. *What is this Thing Called Theory of Constraints and how Should it be Implemented?* Croton-on-Hudson, NY: North River Press, Inc.
- Goldratt, E. M. 1994. *It's not Luck*. Great Barrington, MA: North River Press.
- Goldratt, E. M. 1999a. *Goldratt Satellite Program Session 1: Operations*. Broadcast from Brummen, the Netherlands: Goldratt Satellite Program.
- Goldratt, E. M. 1999b. *Goldratt Satellite Program Session 4: Distribution and Supply Chain*. Broadcast from Brummen, the Netherlands: Goldratt Satellite Program.
- Goldratt, E. M. 1999c. *Goldratt Satellite Program Session 8: Strategy & Tactics*. Broadcast from Brummen, the Netherlands: Goldratt Satellite Program.

- Goldratt, E. M. 1999d. *Satellite Program Session 5: Marketing*. Goldratt Satellite Program. Amsterdam, the Netherlands: AYGI Limited.
- Goldratt, E. M. 2008a. *Consumer Goods S & T*. Level 5. Available from Internet: <<http://www.goldrattresearchlabs.com>>.
- Goldratt, E. M. 2008b. *Strategy and Tactic Tree. Consumer Goods Make-to-Stock (MTS) to Make-to-Availability (MTA) S & T*. Level 5, September 2008.
- Goldratt, E. M. 2008c. *The Choice*. Great Barrington, MA: North River Press.
- Goldratt, E. M. 2009a. *Standing on the Shoulders of Giants. The Manufacturer* [online], [cited 20 November 2010]. Available from Internet: <http://www.themanufacturer.com/uk/content/9280/Standing_on_the_shoulders_of_giants>.
- Goldratt, E. M. 2009b. *The Goldratt Webcast Series: from Make-to-Stock (MTS) to Make-to-Availability (MTA)*. Roelofarendsveen. The Netherlands: Goldratt Marketing Group.
- Goldratt, E. M.; Cox, J. 2003. *The Goal: a Process of Ongoing Improvement*. 3rd ed. Great Barrington, MA: North River Press.
- Goldratt, E. M.; Fox, R. E. 1986. *The Race*. Croton-on-Hudson, NY: North River Press.
- Goldratt, E. M.; Goldratt, R. 2003a. *Insights into Distribution and Supply Chain*. Bedford, UK: Goldratt Marketing Group.
- Goldratt, E. M.; Goldratt, R. 2003b. *Insights into Operations*. Bedford, UK: Goldratt Marketing Group.
- Goldratt, E. M.; Goldratt, R. 2003c. *Insights into Distribution and Supply Chain*. Bedford, UK: Goldratt Marketing Group.
- Goldratt, E. M.; Schragenheim, E.; Ptak, C. A. 2000. *Necessary but not Sufficient*. Great Barrington, MA: North River Press.
- Gruen, T. W.; Corsten, D. 2007. *A Comprehensive Guide to Retail Out-of-Stock Reduction in the Fast-Moving Consumer Goods Industry*. Grocery Manufacturers Association (GMA), Food Marketing Institute (FMI). ISBN 978-3-905613-04-9.
- Kim, C.; Mauborgne, R. 2005. *Blue Ocean Strategy: how to Create Uncontested Market Space and Make Competition Irrelevant*. Cambridge, MA: Harvard Business School Press.
- Ohno, T. 1988. *Toyota Production System: Beyond Large-Scale Production*. New York: Productivity Press.
- Sullivan, T. T.; Reid, R. A.; Cartier, B. 2007. *TOCICO Dictionary* [online], [cited 20 November 2010]. Available from Internet: <<http://www.tocico.org/?page=dictionary>>.
- Womack, J. P.; Jones, D. T. 2003. *Lean Thinking*. New York: Free Press. ISBN 978-0-7432-3164-0.

Rimvydas JASINAVIČIUS. Professor. Department of Management at Mykolas Riomeris University.

Nerius JASINAVIČIUS. Business Consultant. TOC sprendimai.