

# **Just in time retail: a study on barriers for model implementation in micro and small supermarkets in Santos/SP**

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## **Abstract**

This article aims to assess the barriers faced by micro and small supermarkets in Santos city, São-Paulo, to implement the model just in time, through an exploratory study, qualitative and quantitative approach, based on Likert scale. Results responded positively: managers are likely to implement the JIT model despite barriers faced.

**Keywords:** Just in time, Retail, Micro and small markets, Barriers.

## **INTRODUCTION**

The just in time (JIT) patterns, like the Supply Chain Management (SCM), one directly connected to the other, are pointed by some authors as a helping method to competitive advantage (POZO, 2010; BOWERSOX E CLOSS, 2001b), capable of help the MSEs in search of competitiveness with their rivals. This is because the market demands on companies bigger competitiveness requiring that they are even more prepared to compete in their activity area. In this research, the working sector is concentrated in micro and small enterprises (MSEs), in particular the markets on Santos, city on state of São Paulo's coast.

The chosen subject are relevant to this article because JIT is a philosophy very popular on production area, but still not really used on retail. Besides, the study of micro and small markets is a choice considering that the academical contribution will be of great help since micro and small enterprises represents 99% of organizations in Brazil. This means that a great part of population is involved directly and indirectly with these small businesses, as employee, supplier or consumer (SEBRAE, 2012). Add that to the fact that these micro and small markets are part of

great chains when compared with communication and exchange power with great suppliers; however, they act strongly inside the communities.

## THEORETICAL FOUNDATION

In order to list the elements that contributes to the interpretation and understanding required of this research, was performed a theoretical foundation that has the following aspects: Micro and Small Enterprises (MSEs) Classification; Operation Strategies, The Retail, Logistics, Supply Chain, The stock and the supply chain, The just in time and the barriers to JIT implementation.

### Micro and Small Enterprises Classification

Micro and small enterprises in Brazil are majority; however, informations about them are not explored by official agencies. This fact generates difficulties on directing the right resources to promote these companies, which is inconsistent, considering the importance of this segment in economy and the population SEBRAE (2013). The MSEs are responsible by absorb the great part of the labor, especially the young people, because they create income, move the economy and are very important based on their capillarity in the country. According to SEBRAE (2012), these sizes of companies corresponds to 99% of all enterprises in the country, creates 77% of jobs, are responsible for 62% of exportations, pays 40% of the salaries, corresponds to 28% of billing and have 20% of participation in the gross domestic product.

There are at least two ways to characterize MSEs: by their billing, according to circular nº 11 and 34/2011 of National Bank for Economic and Social Development – BNDES and by the number of employees as demonstrated on Table 1, according the operational criterion of Support Service to the Micro and Small Enterprises (2014):

*Table 1 - Characterization sizes of companies by number of employees*

SIZE	EMPLOYEES	
	COMMERCE AND SERVICES	INDUSTRY
<b>Microenterprise</b>	< 09	< 19
<b>Small enterprise</b>	10 - 49	20 - 99
<b>Medium enterprise</b>	50 - 99	100 - 499
<b>Great enterprise</b>	≥ 100	≥ 500

*Source: Adapted of SEBRAE (2014).*

In addition to class by number of employees and by billing, a Brazilian Association of Wholesalers and Distributors (ABAD) categorizes the markets in small and medium-sizes, according to the number of shop cashiers present for purchasing record, as such, the amount of service terminals that owns. The class can be observed on Table 2.

*Table 2 - Market sizes by service terminals*

SIZE	TERMINALS
<b>Micro enterprise</b>	01 - 04
<b>Small enterprise</b>	5 - 19

*Source: ABAD (2013).*

For this research, the class of enterprise size by number of employees was elected as a standard to avoid divergences, because each Brazil state embraces a criteria that varies according to economical and tax situation. However, the ABAD class will be used as a guide for this research questionnaire, since is specific to supermarket companies.

## **The retail**

The retail may be considered a growing sector in Brazil. According to IBGE data (2014), the retail trade in the country starts the year of 2014 registering an increase of 0.4% in the amount of sales and of 0.9% in nominal revenue. According to Brazilian Association of Wholesalers and Distributors (ABAD), the small and medium retail are the leaders on serving the consumers of C, D and E classes, whose great increase of purchasing power is changing the consumption profile in the country, which is justified by the choice of studying this subject (ABAD, 2013).

Kotler (2006) affirms that we can consider as retail, enterprises in which the billing comes from sale of small products or lots.

## **Logistics**

It is getting more pronounced on market that organizations need to develop expertise to face the growing challenges faced ahead; this means to take over a different position compared with their rivals. Among the most important are the development of logistics expertises, which according to Campos (2012) must be in accord with the customer needs and with the internal company goals. Bowersox and Closs (2001b) agree when we say that companies that develop an efficient logistic expertise are more prepared to enjoy a competitive advantage hard to be equalized in performance of service and cost.

Logistics deal with all moving related activities, storage and information (BALLOU, 2001). Pozo (2010) adds that the goal is to facilitate the product flow since the acquisition of raw materials through the point of consumption.

## **Supply Chain**

The synchronicity between the process of a company with his suppliers integrating the material flow, services and information with customer demand started on the 1990s, and was called Supply Chain Management (SCM) (MOREIRA, 2011).

The Supply Chain Management (SCM) is an emerging discipline and in phase of consolidation (MIGUEL and BRITO, 2010), whereupon Slack complements (2006, page 317) when he defines Supply Chain Management as “The management of the complete chain of raw materials, manufacture, mounting and distribution to the final consumer”.

The primary goal of Supply Chain Management, according to Pozo (2010) is to maximize and transform in reality the synergies that exists in potential between the different parts of production chain, serving the final consumer in an efficient way, concerning cost reduction and increase on client satisfaction.

## The stock and the supply chain

For Ballou (2001 page 271) “stocks are accumulation of raw materials, supplies, components, in-process material and finished products that appear in a great number of points in companies distribution and logistics channel”. They represent a maintenance cost that may range between 20 and 40% of their value by year (BALLOU, 2001). Pozo (2010) complements when argued that stock levels control avoids a succession of problems and Ballou (2001) recommends that is economically wise to carefully manage their levels. Also, Pozo (2010) defends that the primary function of stock management is to maximize the use of resources involved in company logistics area and with great effect inside the stock. Bowersox and Closs (2001, page 254a) add that stock management is seen as “the integrated process by which the company policies are obeyed and the value chain in relation to stock”.

About the need to keep stocks, Slack (2006) states that the existence of stocks occurs because there is no harmony between supplier and demand, besides the advantage of providing some safety in an environment marked by uncertainty. On the other hand, Bowersox and Closs (2001a) defends that despite the investment in stock to be substantial, when management exists it is possible to gain decrease and an improvement of “productivity”.

## The just in time

The just in time have been discussed with a lot of frequency in the past years, mostly when related with Supply Chain Management. According to Bowersox et al. (2006), the JIT has as a goal to organize activities in stages so that materials and components purchased find themselves available to production and mounting in the right time in order to occur the transformation process.

Nogueira (2012) agrees when establishes that just in time is a system that aim punctuality, the right material availability, in the right time, in the right place and at the exactly moment of their application. Seen in these terms, Slack et al. (2002) sustains that the existence of a collection of tools and techniques derived of JIT philosophy helps to get the results intended by organization. That way, any incapacity when supplying the product to the client can lead the company to suffer with penalties and loss of credibility because they cannot keep the contractual terms established. That means to say that, according to Figueiredo et al. (2007), a bad service may cause undesirable costs to the clients, which are translated in sales lost, caused by lack of products and high costs in safety stock maintenance, caused by an inconsistence on the deadline on delivery of the supplier.

## Barriers to JIT implementation

In order to meet the existents barriers to the implementation of just in time Chopra and Meindl (2003) studies will be used, which divides the barriers in five stages:

- **Incentive Barriers:** occurs when the gains do not reach the entire chain, because the incentives are passed to different stages on chain.
- **Information Processing Barriers:** situations in which occurs distortions on information demand in different stages of the supply chain.

- **Operational Barriers:** actions that occur between the emission period and the order fulfillment.
- **Price Barriers:** occurs when situations in which the price policies of the product bring on an increase on variability in the order issuing.
- **Behaviour Barriers:** concern about the local action, difficulty on focus on the root cause and so on.

As such, the display of the barriers mentioned on the work of Chopra and Meindl (2003) becomes relevant to the direction of this work, since it is backed on these authors recommendations.

## METHOD

Concerning the research method, it is based on bibliographic research and field research through interviews using the Likert scale, applied in person by the researcher in every studied establishment. It is a qualitative and quantitative research. According to Creswell (2010), this mixed research method allows that the theory may be used as a structure to be tested, in order to get more insights, with the combination and integration of approaches both qualitative and quantitative instead of each one alone, once their combined use brings major comprehension of the research problem.

On this research was made an analysis as a first phase that covers a survey of prepositions founded on the theory, in order to provide foundation to compose the instrument of data collection that is composed by a survey questionnaire based on Likert scale. The questions were elaborated on the basis of the identified barriers by Chopra and Meindl (2003) on the theoretical referential, so the questions help analyze and verify which barriers the micro and small markets face to implement JIT. Besides the specific questions to analyze the barriers, also were proposed some other questions of marker nature, for framing on the company profile chosen for the research. Three experts in retail with focus on markets validated these questions.

In order to identify the population to be investigated, the information of commercial establishments registered on São Paulo's Invoice (SÃO PAULO STATE TREASURY OFFICE, 2014) were consulted. According to the scope of this research, which has the purpose to study the micro and small markets established on the city of Santos/SP, the number of 47 companies was reached. The research subjects corresponds to the owners, managers or persons responsible for managing and monitoring the company. For determination of the sample of this work, a formula proposed by Fonseca e Martins (1996), used on limited populations was applied. Based on experiments of Fonseca and Martins (1996) and allowing a level of trust of 95 we reached a number of 19 micro and small markets as a sample for research in Santos/SP.

The reliability test was applied, being the Cronbach's Alpha that measures the correlation between answers in a survey through the analysis of the answers given by the subjects of research, presenting a medium correlation between the questions. The internal consistency is directly measured by the Cronbach's Alpha coefficient. Typically, the survey is considered reliable if the alpha coefficient is superior to 0.70. The application phase of the researches occurred between July 2nd and October 14, 2014.

## RESULTS AND DISCUSSION

The starting questions of the research instrument, called here as Section A, have the main purpose of characterizing the companies. It was verified in research, represented by 19 companies, the instruction level, with 10% of the interviewed having concluded elementary school, 53% graduated high school and 37% college. The studied companies already exists from more than 10 years, embracing 68% of the analysed companies. Still the markets longevity is distributed on the following proportion: 21% to 2 years, 37% between 2 and 10 years, 37% between 10 and 25 years and 5% with more than 25 years.

Tracing a parallel between SEBRAE classification (2014) by number of employees and the ABAD's classification (2013), compared to size of the markets by number of shop cashiers, it is noticeable that there are no markets classified in micro enterprises by number of employees that owns between 5 and 19 shop cashiers, which is in agreement with both criteria used in this research. However, the same does not occurs with small enterprises, in which it is verified that 21% of them own between 5 and 19 shop cashiers and 47% up to 4 shop cashiers.

### Correlation Analysis

In order to verify how the variables are related, the correlation analysis was used. It is a test that may be used to verify the association between two variables, being the coefficient represented by the letter R ranging between -1 to 1; this means that the closer to the edges, the more will be the degree of correlation between the variables (MALHOTRA, 2006).

Seen in these terms, Cohen (1988) points out that values between 0.10 and 0.29 may be considered small; indexes between 0.30 and 0.49 may be evaluated as average and scores between 0.50 and 1 may be interpreted as large. In contrast, Dancey and Reidy (2005) mark this classification a little different:  $r = 0.10$  until  $0.30$  (weak);  $r = 0.40$  until  $0.6$  (moderate);  $r = 0.70$  until (strong). In any event, is right to say that closer to one (regardless of sign) greater is the degree of linear statistical dependency between the variables. In other way, the closer to zero, lesser is the power of this relation.

Analyzing the variable instruction level of the respondent a significant correlation was detected, that may be considered of moderate to great with the variable amount of employees (-0.609). Since the correlation is negative, according to Figueiredo Filho and Silva Júnior (2009), the negative sign indicates an opposite relation and the value founded suggest the power of this variable. This result illustrates that greater the instruction level of the manager, the lesser will be the amount of employees. Correlating the instruction variable with the amount of shop cashiers, we find as index of -0.620, considered between moderate to great. All the same, being a negative value, suggests an opposition and so we could consider a correlation between a greater instruction level and smaller number of shop cashiers.

### Questions Related to Barriers to JIT Implementation

The results relating to the five barriers pointed by Chopra and Meindl (2003) will be show next.

## **Incentive Barriers**

Observing the answers to the questions related to incentive barriers it is possible to verify that 32% completely agree in relation to the existence of incentives to the employees that avoid waste or cut costs in the studied companies. Adding to that 21% partially agree, in other words, they do not always see these incentives; we have more than half (53%) that notice some incentive of the market to avoid waste, 32% fully agree that they worry with the negative and positive impact that their actions may inflict on the suppliers; 21% that partially agree with the affirmative; 42% of managers do not consider that their suppliers shows concern regarding the impact that their actions causes to the market. Only 11% agree with these affirmative. According to these results, it is verified that different goals exist in the two links of the supply chain. If on one side the suppliers intends to sell to the micro and small markets, learning that they are considered important as clients, the managers of the markets does not feel prestigious with the same level of importance of the big retail chains. Virtually half of the interviewed, in other words, 48%, disagree that the suppliers uses the gain on shipping to stimulate larger purchase batches, which leads to believe that there is no concern about the number of varied deliveries to the same establishment on the part of the suppliers.

## **Information Processing Barriers**

The results shows that 42% of the managers fully agree in relation to the complete knowledge about the demand of the store; 37% partially agree, 79% of the managers affirm to have total domain or at least partial about the demand, prioritizing brands accepted by the customers and avoiding breaks, 5% disagree about complete knowledge of the demand, which leads us to believe that there is no concern, in these cases, in pre-serving clients, but as soon as the goods are emptied of shelves and stocks. There is no agreement in relation to the automated system used to do the inventory turnover evaluation. Activating this resource would help to better understand the demand and would warn the manager the best moment to purchase new products. However, some markets do have this resource on the system, and others do not use it because they do not trust in their own data imputed on the system; 95% of the responding agree that the availability of information about the sales history by items is fast and organized, whether because they own a system dedicated to these tasks, or because they rely upon a hybrid way of stock control, which uses an automated system together with the constant visual check and by means of sporadic statements. There was not an agreement regarding supplier punctuality. However, 63% partially agree about the trust on delivery time of the request products.

## **Operational Barriers**

In relation to the market notifying his supplier ahead of time when purchases bigger than the usual will be done, the research reveals that the responding are conflicted and there is no agreement about this question. This because 42% of those whom in certain way agree that reporting ahead to suppliers when they do orders bigger than usual; added to another 42% whom partially or totally disagree; which confirms the high coefficient of variation calculated to this question, revealing an heterogeneous sample. A deeper analysis of the open questions demonstrates that periods of refueling are prolonged and may prejudice the fueling of the market.

In short, most of the interviewed reported to do their purchases weekly (11 of 19 valid surveys). In other cases, the schedule is realized daily.

In relation to the time of the employees answers, it was asked which difficulties the market face with the suppliers. The answers were quite varied and report problems with the delivering logistics (delays), sending by industries of amount of products above the bearable to spawning, delay on shipping, not shipping the requested good, no deliveries next to holidays, not trading products that arrive damaged, with the market taking responsibility for the loss, prices not negotiable, delivery of goods out of shelf life, prices diverging of the catalog or supplier own order system etc.

## **Price Barriers**

Data obtained regarding the purchase in larger batches with the intention of saving money and also when there are promotions are quite expressive if we add the percentages of responding that agrees totally and partially; as such, we have an index of 79%. With regard to the purchases made with each supplier occurs in constant breaks and weekly frequency, it is noticeable that most part of these purchases are weekly made, with a percentage of 47% to totally agree and 42% to partially agree. If we add them, the index reach 89%. By the characteristics of ongoing purchase volume that a market has, it was expected an expressive result in the weekly supply.

## **Comportamental Barriers**

Managers completely agree about the concern in the counting stock and checking causes of errors in 68% of cases. This result is important because it shows maturity of managers and gives more care with the actions, preventing new errors situations, that may result in wrong purchases (for more or less), lack of goods and capital effort in an inefficient way. Seen in these terms, verifying the reason of these mistakes on the count of the stock helps to fortify a structure of continuous learning. However, 21% still show themselves indifferent to the question. What we can observe is that, in most cases (37%), the employees are completely involved in the process of purchase orders and in stock control, but another 37% partially agree with this information. This fact can be explained, since in many establishments the process of the order is realized directly by the manager, with the support of the sales promoter of the supplier and not by the employees of the market. The results shows that more than half of the managers partially agree with the affirmative that their employees knows how to work in a team. Only 11% fully agree.

In relation to the trend of market employees and suppliers blaming each other for faults, the data is very expressive, because 58% totally agree and others 26% partially agree that this fact occurs. If we add them, the total and partial agreement reach 84%. Based on this, 47% of the managers partially agree that there is a system of mutual learning between the company and their employees when errors occur, in a way to correct and avoid them in new opportunities, without searching guilties. These factors reveal themselves important to the JIT application.

## **Quantitative Analysis with Cronbach's Alpha**

To demonstrate the consistence of the variables of the barriers to JIT model implementation in retail on micro and small markets in Santos/SP, it was realized an analysis of the Cronbach's Alpha. Streiner (2003) considers acceptable as minimum to alpha the value of 0.70; being

pointed index below this value as having an internal consistence of lower scale. In this research, the obtained coefficient of Cronbach's Alpha was of 0,798. That way, the scale presented a good internal consistence with the alpha value observed. This index is an indicative of a high trust level, which can be extended to other works associated to the barriers to the JIT model implementation.

## FINAL REGARDS

The goal of this research was to evaluate what are the barriers faced in order to implant the just in time model in micro and small markets in the city of Santos/SP, based on Chopra and Meindl (2003). Behavioral and operational barriers exist, especially regarding relationship with suppliers, because there are complaints from the retailers related to the difference in treatment between micro and small markets and large retail chains. There is difficulty in relation to the study of incentive barriers. Results show there is conflict of interests which difficulties the application of JIT, which Chopra and Meindl (2003) suggest in these scenarios, a goal alignment so that each member of the supply chain maximize their total profits, working together. There was not a complete agreement in the subject of supplier punctuality; results indicate that there is no exchange of information between suppliers and markets. One favorable factor towards the implementation of JIT is in the resupply deadlines used by these markets; most of them do their requests weekly, others depending on which products are being requested (vegetables and greens, for instance), daily.

Regarding price barriers, 79% affirm to completely or partially take advantage of better prices (sales) in order to save when shopping. However, this attitude signals to the possibility of a whip effect and rise in storage costs. The evaluation of the variance coefficient of closed questions using the Likert scale, that compose the research instrument, demonstrated that the sample is heterogeneous, being an indicative of the variability of answers.

Regarding the questions that seek to draw a profile of the company and its manager, fundamentally in qualitative characteristics; Pearson's Coefficient analysis demonstrated significant correlation, considered moderate to large regarding the total of employees and degree of instruction of the respondents.

Analysis result of Cronbach's Alpha presents a high degree of confidence, with an index of 0.798 which is an indicative that the research results reveal robustness and can be extended to other works related to the barriers for the implantation of the JIT model in micro and small supermarkets, since the referential considered of good internal consistence is at a 0.70 and 0.90 maximum (STREINER, 2003). As a limitation of the research of approaching in a single county. In the interest of continuity of this research, it is suggested to extend the research to other cities in the coast, countryside and other states.

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