Efficiency and Strategy of Companies Operating in the Bottom of the Pyramid (BOP) in Brazil: A Study of the Food Industry in Brazil

Abstract

Since the pioneering studies by James Wright in Brazil, the Bottom of the Pyramid market (BOP) has been widely studied in the Academy; however, few studies on this subject includes the analysis of financial performance of Brazilian organizations that operate in the BOP market. Therefore, the aim of this study is to check whether during the years of 2001 up to 2012 companies in the food industry, which invested in low-priced goods, showed higher financial efficiency than companies that have not invested and what were the main strategies used by these companies to achieve this financial efficiency.

Key-Words:

Bottom of the Pyramid; low-priced goods; strategy; efficiency.

1. Introduction

As of the studies made by C.K. Prahalad (Prahalad and Hammond, 2002; Prahalad and Hart, 2002), the market of low-income consumers and its consumption profile have begun to stand out more intensely in the academic and business community. The so-called "Base of the Pyramid" (Bottom of the Pyramid -BOP) started to be further investigated, both at the global level and at the domestic level. Prahalad (2010) presented to the world a market of around 4 billion poor people living in the "bottom of the pyramid", with a per capita annual income lower than US$1,500 and that, if somehow this market was served, companies assisting it could turn it into a consumer market and cause such companies to make profits.

In Brazil, shortly before Prahalad, at the beginning of the 1990s, the studies of James Wright pointed to this market little explored by Brazilian companies and of great economic potential (Wright et al., 1993).

This potential market, from any of the several existing criteria of socioeconomic classification used in Brazilian academic researches [ABEP (2012), IPEA (2011), IBGE[1] (2011), Kamakura & Mazzon (2013)], presents a large number of potential consumers. Just for illustration of this potential, at the end of the last decade, if it is considered the intersection of the income of up to 10 minimum monthly wages, which is equivalent to R$ 6.760,00, with the number of families using in both the sample of the IBGE (2011), it is found that the consumer market of the low income social classes encompassed about 92% of Brazil's total population.

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1 IBGE - Brazilian Institute for Geography and Statistics

According to Passos et al. (2015), the improvement in income distribution, as of 2006, increased the representativeness of this population and its consumption capacity over time, making it a very fertile field for organizations that proposed to serve this population.

Figure 1 presents the latest available data on the annual growth in the number of families with income of up to five minimum monthly wages over time, as well as the slight increase in the number of families with incomes between 5 and 10 minimum monthly wages. "This represented population was formed by a contingent of 59.29 million of families in 2011" (Passos et al., 2015 p. 112).
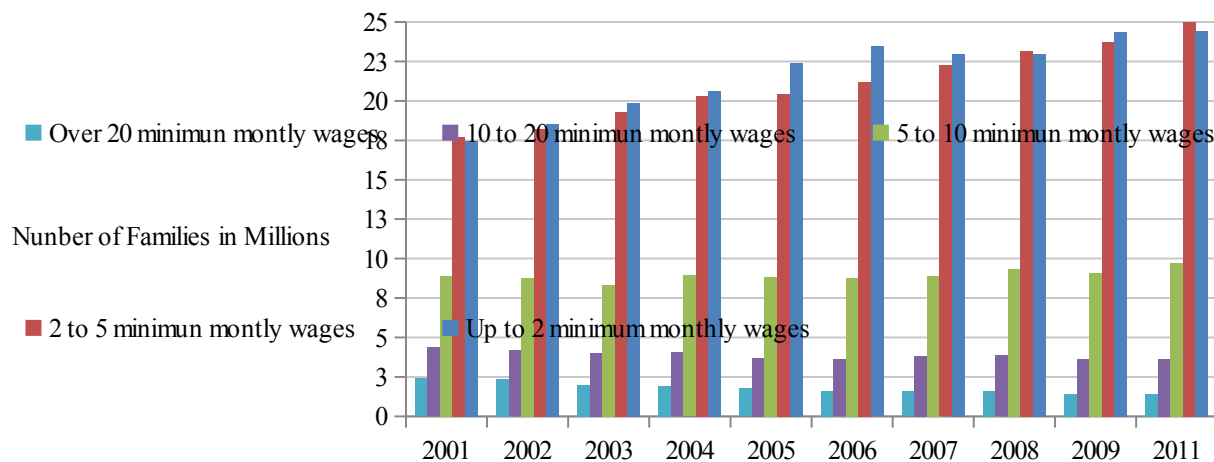
Figure 1 - Distribution of Brazilian families according to income
Source: Passos et al. (2015)

Given this aspect, it makes sense the interest of companies in this market, as well as in the main strategies to serve it.

"Despite the importance of the theme [...]", there are few reference works on low-priced goods market in Brazil. "Most of the literature and the researches in administration are based on business models that serve mainly the European, American and even the Asian markets [...]", of distinctive features to those found in Brazil (Giovinazzo, 2003, p. 2).

Some academic researchers have been conducted in Brazil about the organizations and the bottom of the pyramid consumption, however, the research of Passos et al (2015), according to a survey carried out in the indexers Google Scholar, *Scopus and Institute for Scientific Information*, was the last survey conducted with the organizations financial data, in order to verify that in only four of the twelve years examined, the financial performance of the furniture industry, which directed its products (low-priced goods) for low-income consumers, showed a financial efficiency greater than the companies who did not do the same. Prior to this survey, only the study of Giovinazzo (2003) pointed out that a wide range of companies from many different sectors and that had served the BOP consumer between 1997 and 2001 were precisely those that

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reported the best financial results. The researches together, examine 15 years of studies on the financial performance of the BOP organizations in Brazil, albeit with different methodologies and samples.

Although in Brazil only these studies have reported the financial performance of the organizations that served the BOP, Jaiswal (2008) points that rare are the cases in the companies' literature that have failed in the effort to serve the BOP.

Given this landscape it emerges two issues: would the food manufacturers that served the lower income population providing them low-priced goods in the last decade, be recording better financial results than the industries that did not meet this market needs? What were the strategies used by these companies to meet the BOP needs?

Thus, the main objective of this study is to check whether the food companies that worked in the BOP, over the period between 2001 and 2012, providing low-priced goods, were more efficient financially than companies that did not work in the BOP, in addition to checking the different strategies among companies that came into the BOP market, and those who chose not to enter in such a market.

The research main hypothesis, grounded on inquiries carried out in the studies of Giovinazzo (2003) and Passos et al (2015) are: *1)* that the companies that worked in the BOP market showed greater financial efficiency than the companies that operated in the standard goods market between 2001 and 2012; *2)* companies presented a very different strategy to reach this market with respect to the strategy of the companies that worked for the high income consumer, a fact that can sustain their financial efficiency.

These study main operational definitions are described in the next section. The methodological approach is described in section 3. The main results and findings are presented in section 4. And finally the final considerations are described in section 5.

2. Theoretical framework: Operational definitions and strategy for the BOP

It is necessary to define first, low-priced goods, once the market has already been defined earlier.

Giovinazzo (2003), based on the economic concepts discussed by Pyndick and Rubinfeld (1994), Varian (1994) and Ferguson (1993), conceptualized low-priced goods as the goods "[...] positioned predominantly for the C, D and E income classes, whose income effect is negative, in other words, an increase in income should lead to a replacement of these low-priced goods or this low-priced brand for higher-priced goods or brand". (Giovinazzo, 2003, p. 18). Kamakura and Mazzon (2013) identified this characteristic in their study showing that lower income populations increase the volume of their products or improve the quality of essential goods consumed, because of an increase in the budget.

"In contrast, by quoting Ferguson (1993), Giovinazzo (2003) presents a **standard merchandise** as that one where an increase in income should cause an increase in the consumed merchandise, in other words, the income effect is positive" (Passos et al ., 2015 p.113).

A product or low-priced service meets the needs of the lower-income consumers, usually the cheapest in its class, limited to 10 minimum wages, or belonging to classes C, D and E, in the case of the Brazilian population (Giovinazzo, 2003; Sobral et al., 2005). "They must also provide payment terms that enables the acquisition of these goods by lower income consumers such as: credit, retail outlets and compliance with the consumer needs" (Passos et al., 2015 p. 113).

As in the study of Passos et al (2015), the same definition will be adopted, in which the low-priced goods are usually the cheapest products in a product category, present good quality, meet the needs of low-income consumers and that require credit in order to be purchased.

"Once defined what low-priced goods and standard goods are, it is time to present the main strategic approaches that can influence the performance of the organizations working in the BOP" (Passos et al., 2015 p. 114).

"In order to meet the low-income consumer's needs, companies need to understand their reality, their needs and develop **specific strategies**" (Barki, 2006, p.37).

Rocha and Silva (2008), in their studies, suggest that the access to the BOP market needs to have products and **specific processes** to the needs of these consumers with **innovative and creative solutions, affordable prices** and with **new channels**. Corroborating this idea, Schrader et al. (2012), in surveys with multinationals working in low income markets, verified the high customization and personalization of this target market needs, also adding an important condition, which is the maintenance of a steady supply of raw materials through relationships with local partners in the value chain. "Often, multinationals must also seek non-traditional partners such as NGOs, community organizations or government agencies." (Rivera-Santos & Rufin, 2011). The **simplification of operations** for Rangan et al. (2011) ensures a commercially viable and sustainable model for operations with the BOP.

Akter et al. (2012) confirmed the Prahalad approach (2010) on the overall **quality** of the service at an affordable cost, as an inducer aspect of the trust, satisfaction and the relationship continuity intention, so that profit can come from consumption on a large scale.

Porter (1986, 1989), long before, had established different **strategic dimensions** that help and give consistency to successful companies by the fact that they gain a competitive advantage compared to their competitors. These dimensions were successfully used in the study of Giovinazzo (2003) and in the study of Passos et al. (2015) and verified as important for companies operating in low-income markets.

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In the work of Giovinazzo (2003), six important dimensions were seen as relevant to the sector performance with the low-income market: **the price**, the lowest in the market; **the cost**, companies invested in equipment and **technology** that allowed them to present lower costs; **the distribution channel and differentiation**, companies invested to develop the brand with the end user, relying on the distribution channels support; and the **quality**, as companies sought to meet all requirements in terms of raw materials, specifications and tolerances, etc.

In the study of Passos et al. (2015) the dimensions in common with the study of Giovinazzo (2003) were the cost, the technology, the quality of the product and the differentiation. The authors mentioned above, added, after studying the furniture industrial sector, the dimension of **customer service**, offering easy access to products, efficient distribution, in the shortest possible time and displaying good quality; the **brand identification**, identifying that the brand proximity with the consumer makes him feel recognized and valued, which contributes to his adherence to the brand; and, finally, the **company specialty**, where the results indicated that companies that work to the BOP present lower product mix compared with companies that does not work.

Parente and Barki (2005) point out three different retail service strategies to the BOP: **low price** strategy, reducing operating costs induced by a lower level of assistance, limited quantities and fewer services; **benefits** strategy, with the pursuit of the customer preference through benefits, good service, variety of products and good facilities; and the **proximity** strategy, with the value proposal tied to the physical proximity and a more intimate relationship with the customer.

Another fundamental aspect to the BOP context is the access to **credit**, which allows the social inclusion of the lower classes, as it is through it that the population has access to the consumer goods (Prahalad & Hart, 2002; Rocha & Silva, 2008; Wright & Spers, 2011).

Krause et al. (1998) and Adams et al. (2012) point out that one of the key variables for strategic relationships between suppliers and customers is the **negotiation of prices, payment and delivery terms and knowledge exchange.** Negotiations are important because they allow a partnership which is based on loyalty and trust between suppliers and customers, vital, according to Prahalad (2012), to meet to the BOP needs. Parente and Barki (2012) point out that, frequently, between small suppliers and their customers, this relationship expands to relations of friendship that guarantee the preference in the businesses to meet the BOP market needs.

In this study, it were also included the emergent strategies of **internet** use and the **social networks** use, conceptualized by Passos et al. (2015), citing Mintzberg (1978), as strategies that are not initially planned by the organization, but over time and having in view the technology and customs changes, they start to be perceived by companies as important strategies. Faced with the popularity of portable microcomputers, the technological innovation of

mobile phones and the enlargement of services provided by the worldwide network computers, with the consequent change in habits, many organizations have come to see these tools also as an access to the BOP market (Passos et al. 2015). This can be evidenced in Brazil, by the companies' internet websites strongly associated with the BOP, for example, Casas Bahia. Soares and Hoppen (1998) point out that the Internet was able to create a new business model based on new systems, marketing management, among other facilities that make it a very useful tool. However, there should be emphasized that the interactions and relationships between companies and consumers are fundamentally different on the internet. "In terms of business, the Internet is a tool with plenty of potential." (Smith & Hoppen, 1998, p. 96).

Although little discussed academically, social networks are an ever increasing target of relationship marketing actions by the companies, according to Rocha et al. (2013). "Companies are using social networks to provide content and rendering of services, contributing to the relationship building with customers." They present themselves as a great opportunity to improve the relationship with end consumers and their interaction (Rocha et al., 2013, p. 278).

In face of the main strategies presented, this study will use the main strategic dimensions of Porter (1986,1989), successfully used in the scale of Giovinazzo (2003) and adapted in the studies of Passos et al. (2015) in order to define the variables used in the primary research.

Another important operational definition for this study is the reference on the financial results or **financial performance** of the organizations, differing themselves from Giovinazzo studies (2003) by the concept of **financial efficiency**.

There is a consensus among scholars that there are several ways to identify the metrics for the organizations financial performance, but there is no consensus on which one would be the best, since each of them leads to a different conclusion and even conflicting conclusions, regarding the financial performance of an organization (Macedo & Corrar, 2012; Passos et al, 2015). "For this, it is necessary to apply methodologies that integrate the indicators of the financial accounting analysis, in order to organize and to condense information, taking into account the number of indicators and the diversity of possible combinations for the performance analysis." (Macedo & Corrar, 2012, p. 4).

Given this scenario, based on the studies of Bezerra and Corrar (2006); Macedo et al. (2012) and Macedo and Corrar (2012), whose criterion was used in the studies of Passos et al. (2015), the financial efficiency will be measured through the main and most commonly used financial indicators extracted from the financial statements and handled by the multivariate technique of Factorial Analysis and by the Data Envelopment Analysis (DEA).

Next section will present the explanation on the calculation of financial efficiency, the components of the primary research, with the remainder of Porter's dimensions (1986) that have not been explored previously, but are easily identified through the questions in the questionnaire in the Figure 2, as well as the research activity field.

3. Methodological Approach

The study can be regarded as exploratory-descriptive, according to Hair et al (2005). It is exploratory because it aims to turn the research problem more familiar and explicit, due to the limited availability of information in the national literature on the financial efficiency of organizations working in the BOP. It is descriptive because it describes the strategy characteristics of the companies in the sample and keeps relationships between the variables, seeking to build hypotheses from a theoretical framework and cross-sectional data.

Regarding the means, this research combined primary and secondary surveys at the companies. The secondary surveys have provided the companies' financial and registration information data; the primary data, in turn, were collected at the companies through a self-managed survey, structured via electronic instrument, and sent to an e-mail list of respondents in the Brazilian food industry segment.

Regarding the sample, according to Hair et al. (2005), it fits as non-probabilistic by convenience, that is, it does not intend to be statistically representative of the population and involves the selection of more available data. Thus, in the registration information query of the primary research, it was adopted the *Hyperion* system, which raised all companies in the food industry that possessed financial statements between 2001 and 2012, at the Serasa Experian database, a leader in credit information solutions. Sequentially it was carried out an initial phone contact to get a valid e-mail with a sample of 2,529 food industries. The query to answer to the primary research in the electronic medium was held between June 27, 2013 and August 02, 2013. From the 354 companies that received the invitation to participate in the study, 181 accessed the questionnaire; however, only 148 companies filled it completely, being the respondents highly qualified for the research purpose, with the participation of CEOs and Directors, (32.6%), Managers and Supervisors (57.3%), Analysts, Technicians and Advisors (5.8%).

Out of the total of industries population, according to the industrial annual survey of companies carried out by IBGE (2012) this number of respondent companies (148) represents a reliable margin of 90% and a sampling error of 6.7% for the proportion of success of 50%. The sample does not intend to be representative of the population, however, it can be checked an adherence of the companies in the sample respondents to the original characteristics of the country's industries population distribution, where the companies' concentration is at the South and Southeast Region.

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The criterion for analysis of the companies' sizes was also referenced, like the study of Passos et al. (2015) at the Serasa Experian information, being the following the main criteria for sizes of organizations: (1) Companies *Small* - Total Assets smaller than R$ 100 thousand and Net Sales below R$ 250 thousand; (2) Companies *Small Plus* - Net Sales between R$ 250 thousand and under R$ 4 Million and Total Assets between R$ 100 thousand and under R$ 4 Million; (3) Companies *Middle* – Net Sales or Total Assets between R$ 4 million and less than R$ 25 million; (4) Companies *Middle Plus* - Net Sales or Total Assets between R$ 25 million and less than R$ 50 Million; (5) Companies *Corporate* - Net Sales or Total Assets between R$ 50 million and less than R$ 200 Million; (6) Companies *Corporate Plus* - Net Sales or Total Assets over R$ 200 Million.

The food industry comprises about 53,422 companies, according to the industrial annual survey of companies carried out by IBGE (2012) that process and commercialize products intended for human food. This industry encompasses the coffee industry, the products of vegetable origin processing industry, the slaughter industry and meat processing, the cooling and preparation of milk and dairy products, the sugar industry and the manufacturing and refining industry of vegetable oils and fats for food.

This sector presents an average participation in the GDP of 9.1% and records more than 1.5 million jobs, according to Table 1, distributed mainly in the South and Southeast regions of the country, according to data of the annual industrial survey of companies, carried out by IBGE (2012).

Table 1 - Indicators of the food industry

	2008
	269,0
	1.412, 4
	8,9
	16,7
	190,4

Source: Adapted from ABIA - Brazilian Association of Food Industries (2015)

According to Rodrigues et al. (2013), the food industry is placed in the intensive company category in scale, where companies compete for costs and sell standardized products, the commodities. There are also companies that adopt competition strategies aiming at a differentiation. The group oriented by commodities consists of specialized companies that assign greater importance to the low cost of production and raw materials, while the group oriented by high added value is more independent technologically and performs more innovations in product than in its processes, aiming to differentiate their products, competing through quality and brand, where advertisement and marketing are fundamental.

The actual income mass determines the performance of the food sector, in other words, when income rises, the demand for food tends to rise too, where the actual income determines the quality of the consumed products and the employment level determines the quantity . According to Table 2, families earning lower average income tend to allocate a higher proportion on food at home, while families earning higher average income tend to spend less on food at home, which requires from the food industry in meeting the BOP needs a good relationship with food retailing, in theory, greater than in relation to services (represented by food away from home).

Table 2 - Percentage distribution of average monthly household expenses on food, according to the income classes

	Total	Up to R$ 830	More than R$ 830 up to R$ 1.245	More than R$ 1.245 up to R$ 2.490	More than R$ 2.490 up to R$ 4.150	More than R$ 4.150 up to R$ 6.225	More than R$ 6.225 up to R$ 10.375	More than R$ 10.375
1. Food expenses	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
2. Food at home	68,9	82,8	79,2	73,9	67,3	63,6	57,8	50,7
3. Food away	31,1	17,2	20,8	26,1	32,7	36,4	42,2	49,3

Source: Adapted from IBGE - Family Budget Survey (FBS) (2008-2009).

Backed up in Giovinazzo (2003) and Passos et al. (2015), for handling information of the primary research, in the present study, respondents also indicated the participation of goods or low-priced products in the composition of their revenues, and so, it was possible to determine the company's efficiency and their respective strategies according to the market segment. For companies that presented participation in the revenues of over 60% in low-priced products, these companies would be considered as active to the BOP market. On the other hand, companies that presented participation of low-priced goods below 40% were considered as non-active in the BOP or, for measurement effect, producing goods or products considered normal. Thus, 11 companies that were in the intermediate position are classified as mixed, 89 companies were classified as active in the BOP and 48 as non-active companies (normal goods).

Besides the markets identification, the survey recorded the main opinions of the organizations' participants consulted about the main variables of the strategic dimensions shown in section 2 of this study. Figure 2 presents the main issues segmented by type of dimension, by authors who described them in their studies and by the evaluation scale which was used, briefly, replicated from the study of Passos et al. (2015).

Strategic Dimension	Author (s)	Question	Scale

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Brands differentiation	Porter (1986); Giovinazzo (2003); Prahalad (2010).	Degree to which the company seeks to differentiate its brand with its consumers through promotions, advertisements, sales force, packaging, among other	Likert 0 – 10 0 low 10 high
Quality of the Product	Porter (1986); Giovinazzo (2003); Prahalad (2010);	Product quality level in terms of raw materials, specifications, certifications etc.	Likert 0 – 10 0 low 10 high
Technological Leadership	Porter (1986); Giovinazzo (2003); Rocha and Silva (2008) Schrader et al. (2012).	Degree to which the company seeks to be at the technological leader in its sector.	Likert 0 – 10 0 low 10 high
		To whom is it assigned the innovation of its products and services?	Categorical 5 items
Position in the Cost	Porter (1986, 1989); Giovinazzo (2003); Barki (2006); Prahalad (2010).	Degree to which the company seeks the lowest cost position in the production and delivery of the product through investments in facilities or equipment to	Likert 0 – 10 0 low 10 high
		Indicate another way of cost minimization:	Categorical 5 items
Customer Service	Porter (1986); Giovinazzo (2003); Barki (2006); Prahalad (2010); Akter et	Degree to which the company provides ancillary services in its product line, such as technical assistance, own assistance network.	Likert 0 – 10 0 low 10 high
Channel Policy	Porter (1986); Giovinazzo (2003); Barki (2006); Rivera-Santos and Rufin	Degree to which the company seeks to develop the brand identification directly with the end consumer.	Likert 0 – 10 0 low 10 high
Vertical Integration	Porter (1986); Rivera-Santos and Rufin (2011); Schrader et al (2012).	Degree of integration forward or backward adopted by the company including the distribution and exclusive retail stores.	Likert 0 – 10 0 low 10 high
Price Policy	Porter (1986); Prahalad and Hammond (2002); Giovinazzo (2003); Barki (2006); Rocha and Silva (2008); Prahalad (2010).	Degree of importance the company gives to the final price for the product sales.	Likert 0 – 10 0 low 10 high
		Regarding the company's pricing and competition policy, on average, what is the percentage that its price tends to stay above / below average compared	Metric %
		How are the company's final prices formed?	Categorical 5 items
Internet Use	Soares and Hoppen (1998).	Degree of use of electronic exchanges, information flows and assets originated through the internet.	Likert 0 – 10 0 low 10 high
Use of Social Networks	Rocha et al (2013)	Degree of use of social networks (Orkut, Facebook, Twitter, LinkedIn, among others) for the company's public relations and for the products	Likert 0 – 10 0 low 10 high

Channel Selection	Porter (1986); Giovinazzo (2003); Prahalad (2010); Rivera-Santos and Rufin	Model in which the company seeks to reach its consumer at the sales outlet through the distribution channel. How the distribution of your business is	Categorical 5 items
Company Specialty	Porter (1986); Giovinazzo (2003); Barki (2006); Schrader et al (2012).	Degree to which the company spends its efforts on its product line or market segments. How many product categories does your organization work in?	Metric – Amount of Products and Segments
Loan Policy	Krause et al. (1998); Prahalad and Hart (2002); Rocha and Silva (2008);	Relationship between customers and suppliers. Number of days that the company finances its customers. Number of days the company borrows	Metric – Number of Days

Figure 2 - Main strategic dimensions used in the questionnaire
Source: Adapted of Passos et al. (2015).

The reliability of the questionnaire was tested in the SPSS-18 software, through the *Cronbach's Alpha* test. Results between 0.7 and 0.8 are considered good ones for the use of the responses in multivariate researches (Hair et al., 1998) .The *Cronbach's Alpha* of the ordinal nature questions presented 0.733 and 0.757 for the standardized.

To verify the first hypothesis of the study, the procedure was to calculate the conventional indexes used for companies financial analysis, taken at the Serasa Experian database, in accordance with the procedures of the study of Bezerra and Corrar (2006); Macedo et al. (2012) and Macedo and Corrar (2012), year after year (2001-2012), and subsequently remove the outliers indicators from the information that could jeopardize the study outcome. As in the study of Passos et al. (2015), 20 indicators were extracted, composed of indicators of Liquidity, Activity, Capital Structure, Profitability, and two more indicators were added: Wealth per Employee = (Available Profit for the Ordinary Shareholders or Quota holders at the Limited) / (Number of Company's Employees) and Revenue per Employee = (Sales Revenue) / (Number of Company's Employees), presented in the works of Macedo and Corrar (2012).

A Factorial Analysis, by extraction method of principal components with varimax rotation criterion was used to simplify the analysis to a smaller number of indicators in order to facilitate the next step by the use of the next technique for calculating the financial efficiency. Thus, it was possible to reduce the number of indicators for up to 9 indicators per fiscal year. The *KMO* and *Bartlett* tests ensured the suitability of the factorial analysis. Year after year, it was found from 4 to 6 retained factors explaining on average more than 80% of the variance of the original variables; from these factors, the main indicators were chosen from year to year, based on the rotated matrix of each factor. According to Macedo et al. (2012) it is opted for choosing more indicators of the factors with higher explanatory power, respecting the proportion of explanation of each one. Thus, the main and most representative indicators in each year separately evaluated were: Operational margin, Net margin, EBITDA margin (more present in the first factor), General Liquidity, Current Liquidity, Third Party Capital on

Equity, Immobilization of Liquid Assets, Quality of the Debt, ROA, ROE, ROI (more present in the second and third factors), Asset Turnover, Immobilization of Non-Current Assets, Revenue per Employee (more present in the last factors).

The following procedure was the use of financial indicators of each year in a Data Envelopment Analysis (DEA) in order to characterize a measure of performance, oriented by an index only, and built by several different performance approaches. This use of own financial indicators differs methodologically from the study of Passos et al. (2015), who used the factorial scores to assemble the DEA, unlike what presented Macedo and Corrar (2012), who also used their own financial indicators for assembling the DEA, an approach which, from a methodological point of view, proved to be more suitable for that data sample.

The DEA model used in the present study is the BCC of Banker, Charnes and Cooper (1984) that consider variable returns to scale and does not assume proportionality between *inputs* and *outputs*, useful for this study because of the difference of scale of the different companies analyzed and because such a model also shows negative indexes in some variables such as margins, ROE, ROA and ROI.

Through the logic of data input of the model, oriented to outputs, in other words, in this case, it will be used the orientation product, since it is sought to maximize the product (improves liquidity, margins and profitability), keeping constant the resources employed in it (capital structure, immobilizations, quality of debt etc.). The input data were the indicators of the kind: the smaller the indicator, the better the company's performance and for the output data the indicators of the kind: the higher the indicator, the better the company's performance. In other words "in order to improve its performance, a company needs to reduce its third party capital risk and its level of immobilization as well as increase its wealth created in proportion to total assets, sales, its turnover and liquidity" (Macedo et al., 2012 , p.20).

The analysis models for each year were performed in the SIAD - Integrated System of Decision Support (. Angulo-Meza et al, 2003) in order to rank the classic efficiency indexes achieved by the companies in the DEA sample and its inverted and compound borders, standardized, divided by the largest composed efficiency. Thus, it was possible to create a ranking of the most and the least efficient companies financially, thus favoring the comparison of the respondents' responses on the research variables with their respective indexes of relative financial efficiency.

With the ranking of the most efficient companies of inverted borders, composed and standardized, it was possible to carry out an ANOVA (Analysis of Variance) to compare the averages of the efficiency of companies operating in the BOP with companies that do not operate in this market (normal and mixed), year by year. To that end, the normality assumptions were tested for each group of companies as well as the homogeneity assumptions of the variances between the groups according to the *Kolgomorov-Smirnov, Shapiro-Wilk* and *Levene* tests, respectively.

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Having the significance level duly observed, the normality tests for each group and the homogeneity of variances tests presented *sig.*(*significance*) greater than 5%, it was possible to conclude that each of the groups presented a normal distribution and that the variances are homogeneous. Assumptions satisfied for the application of ANOVA for all the annual efficiencies, as shown in Table 3.

Table 3 - Test ANOVA One-way

Year	Finance Efficiency	Sum of Squares	Df	Mean Square	F	Sig.
2001	Between Groups	.008	1	.008	.081	.777
	Within Groups	3.766	40	.094		
	Total	3.774	41			
2002	Between Groups	.015	1	.015	.200	.657
	Within Groups	3.465	46	.075		
	Total	3.480	47			
2003	Between Groups	.146	1	.146	**3.700**	**.060**
	Within Groups	1.854	47	.039		
	Total	2.000	48			
2004	Between Groups					
	Within Groups					
	Total					
2005	Between Groups					
	Within Groups					
	Total					
2006	Between Groups					
	Within Groups					
	Total					
2007	Between Groups					
	Within Groups					
	Total					
2008	Between Groups					
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	Total					
2009	Between Groups					
	Within Groups					
	Total					
2010	Between Groups					
	Within Groups					
	Total					
2011	Between Groups					
	Within Groups					
	Total					
2012	Between Groups					
	Within Groups					
	Total					
μ	Between Groups					
	Within Groups					

Total	

In the variance analyzes applied year after year, only in 2004 there was the rejection of the null hypothesis of equality between the means at the 5% significance level. In 2003, rejection occurs only at the 10% significance level. Based on this observation, the next step was to verify the second research hypothesis.

To check if there really is one or more differentiated strategies among companies operating or not in the BOP, a procedure different of the one presented in Giovinazzo (2003) and Passos et al. (2015) was adopted in order to better adequacy of the variables and of the method for this data sample. Faced with the confirmation that the main variables are ordinal and categorical, taken from the dimensions shown in Figure 2, it was made the use of a Logistical Regression where the dependent variable: type of goods offered ("0" normal - "1" low-priced) represents the probability of occurring or not the event of interest (in this case to meet the BOP needs) according to the main strategic dimensions that differentiate the independent variables related to all strategies determined on the survey and the characteristics of size and activity time. This probability is given generically by the following expression:

$$p_i = \frac{1}{1 + e^{-(\alpha + \beta 1. X 1i + \beta 2. X 2i + ... + \beta k . Xki)}} \qquad (1)$$

Aiming at finding the best model for the number of independent, categorical and ordinal variables, the Forward Wald method was used in the SPSS-20 software, where the variables that did not present degree of significance in determining the probability of a company work in the BOP were excluded from the model. The statistics χ^2 =24.177 with sig. χ^2 = 0.000 < 0.05 demonstrates that the model is statistically significant for predictive purposes. The Hosmer-Lemeshow test presented χ^2 = 5.496 with 8 degrees of freedom and sig. χ^2 = 0.704> 0.05, thus showing that the final estimated model does not present problems regarding the quality of the proposed adjustment. The model also presents as Global Efficiencies a percentage of 71.5%, in other words, the classification accuracy percentage. Table 4 presents the output of the generated model:

Table 4 - Variables in the equation

Step 3							95% C.I. for EXP(B)	
Variable	*B*	*S.E.*	*Wald*	*df*	*Sig.*	*Exp(B)*	*Lower*	*Upper*
Importance Price	0.413	0.113	13.399	1	0.000	1.511	1.211	1.884
Age	0.038	0.017	5.086	1	0.025	1.038	1.005	1.073
Customer Credit Policy	-0.033	0.015	4.982	1	0.026	0.967	0.939	0.996
Constant	-2.125	0.974	4.764	1	0.029	0.119		

Thus, it can be written the final expression of estimated probability that a firm i meets the BOP needs:

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$$p_i = \frac{1}{1 + e^{-(-2.125 + 0.413. \, Import\hat{a}ncia \, Pre\c{c}o \, i + 0.038 . \, Idade \, i - 0.033. \, Pol . Cred . ao Cliente \, i)}} \quad (2)$$

Where: **Importance Price** = Importance of the final price for the products sales (scale from 0 up to 10); **Age** = Company foundation time in years, up to the year of 2012; **Customer Credit Policy** = Credit time, in days, offered to the customer so that he can pay for the purchases.

The last step was the ROC curve area analysis that presented discriminatory power of 0.737, with an interval between 0.648 and 0.826, being therefore, the proposed model considered reasonable for a *cutoff* of 0.5.

4. Analysis and discussion of results

The combination of methods of data analysis in this study presents evidence that there are not differences in the organizations financial efficiency in the sample, regardless of their market segment be BOP or not. This observation does not corroborate the statement of Jaiswal (2008) on the successful cases in the literature of companies that have joined the BOP; this observation also shows a result different from the one found in Giovinazzo (2003) and Passos et al. (2015), although these studies had been methodologically different in the calculation of financial results and financial efficiency, respectively to the studies. In the period from 2001 up to 2012, excepting 2003 and 2004 (with 90% and 95% of confidence margin, respectively), there is no evidence of difference in the results of the remaining years.

Rodrigues et al. (2013) state that the food industry presents two very defined foci, which are mixed among those who meet or do not meet the BOP needs and were previously commented in section 3 on the food sector, which corroborates to make no difference to the financial efficiency of the food companies in the sample.

In the study, it was possible to identify the variables that differentiate the companies that operate or do not operate in the BOP; between these variables, two strategic dimensions, the **price policy (Importance Price)** and the **credit policy (Customer Credit Policy)**, and the variable age, related to the amount of years in relation to the foundation date of the company and its Balance Sheet of 2012.

The price policy appears as one of the strategies which can differentiate the companies that operate or do not operate in the BOP. The positive and representative beta of the variable price can be interpreted as being of great importance in the low-priced market. Although there is not, statistically, in this study, a differentiation between higher prices, lower or equal, a question asked to the respondents, which was eliminated in the regression, the importance of price is a unanimous variable and corroborates all authors surveyed, where low prices make it possible for the BOP markets

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access the products (Porter, 1986; Prahalad & Hammond, 2002; Giovinazzo, 2003; Barki, 2006; Rocha & Silva, 2008; Prahalad, 2010).

The negative beta registered in the credit policy (though not very representative) can be a curious finding and leads more to reflections than to clarifications, since it presents the companies focused on the low-priced market as tending to buy with a shorter payment terms than with longer payment terms. Although it is not possible to find the theoretical framework for this finding, it does not contradict the theoretical framework of this study, pointed out in section 2, which shows the payment term as a facilitator for the acquisition of goods and services by low-income consumers (Prahalad & Hart, 2002; Rocha & Silva, 2008; Wright & Spers, 2011). As this study deals with the industry analysis and properly the relationship with retailers, it is admitted other possibilities.

As most of the BOP literature is related to the companies behavior (manufacturing, wholesale and retail), always related to the BOP final consumer, and little in relation to the value chain particularities, as the credit relationship between industry and retail , even more specifically in the credit policy (negotiation between suppliers and customers), it can be inferred as one of the possibilities, based on the concepts of finance, that the financial discount may be the reason why the retail food seeks for lower prices with the food industries; here is also a justification for the lower prices of the price policy, as the financial discount means a better price achieved by the customer. From the standpoint of the strategic relationships between suppliers and customers, also explained in section 2, Krause et al. (1998) and Adams et al. (2012) state that the price negotiation, the negotiation of payment and delivery terms, as well as the exchange of knowledge between both parties are important aspects. Although this statement has no power to explain the shorter term found in companies that meet the BOP needs, it makes it possible to conclude that the discounts are a possible explanation, based on the strategic and rational relationship. Also, based on the question posed to respondents of the food industry in this research (Figure 2), related to the indication of other forms of cost reduction by the company, of the137 responding companies, 31 companies (23%) stated that they seek rebates with suppliers; of these, 25 companies (81%) were companies that worked in the BOP market, which apparently reveals to be a practice, at least in this industry and in this market.

The third variable, with insignificant beta, was the result of the sample, which leads to the inference that companies that worked for the BOP are more mature.

The dimensions of price policy and the credit policy were also found, along with other dimensions in this same sample, by the Multiple Correspondence Analysis technique (MCA), which validates the results, although the MCA presents lower methodological and accuracy rigor.

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5. Final Considerations

The BOP market was quite favored in Brazil by the improvement of income distribution, which allowed access to low-income consumers to products that were previously inaccessible, considerably increasing the market size. In Brazil, the studies of Wright et al. (1993) had already pointed to this important market. Later, studies of Giovinazzo (2003) showed that companies that offered low-priced goods presented better financial results at the end of the 1990s. Recently Passos et al. (2015) have found that in just four years, from 2001 to 2012, the furniture industry recorded financial efficiency. Yet, few are the studies on the organizations financial performance, working in the BOP, given the limited availability of financial data of companies in Brazil for such a purpose.

Thus, this study aimed to contribute to reduce the lack of information on the financial performance of the organizations working in the BOP. Although coming from a non-probability sample, this study covers a period similar to the studies of Passos et al. (2015) presenting the food industry through a data analysis technique different of the one used by them, it is believed, even more robust.

Despite the limitations described below, this study has achieved its main goals and has responded to the problem questions in order to refute one and confirm another of the hypotheses presented, by showing that during the period from 2001 to 2012, only in 2004 it was observed a statistical difference, with 95% confidence margin that the companies offering low-priced goods recorded higher financial efficiency, while companies that did not offer products for the BOP recorded lower financial efficiency. As in other years it was not possible to make these statements, it is argued that, for the data of this food industry sample, it made no difference to the companies financial efficiency that worked or did not work in the BOP, thus, rejecting the first hypothesis that companies that operated in the BOP market showed higher financial efficiency, compared to those that did not work. The structure of the sector organizations, strongly oriented in the general strategies of Porter (1989) with two foci deeply defined in low cost and differentiation, according to Roberts et al. (2013), help explain this phenomenon.

In the study, it was possible to identify two distinctive strategic dimensions among the companies that work for the BOP and those that do not work. They are: price policy and credit policy; besides a variable of sample characteristic, the age of the company.

The lowest prices proved to be important to serve the BOP, in this study, corroborating the referenced authors; however, the shorter payment terms of retail companies can be explained by rationalized assumptions about finances in the strategic relationships of the value chain and in the data of the research itself, justified in the previous section. In this sample, the more mature companies tended to meet the BOP needs.

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Although these strategies do not guarantee the improvement of the organizations financial efficiency, as already noted, they are inherent to the meeting of the BOP needs, confirming the second hypothesis of the research that companies that worked for the BOP market presented at least a quite different strategy to work in this market in relation to the strategy of the companies that worked for the high income market.

The main limitations of the study were the sample size and the low adherence of the Brazilian business community, especially from the North and Northeast Regions, in relation to respond to scholarly research. The research also brings some biases such as the gaps presented in the financial analysis due to the extraction of *outliers* financial indicators, which reduced the number of organizations in the sample year by year to calculate the factorial analyzes and subsequently the envelopment analysis.

As main suggestions for future researches, it would be promising to search for theoretical framework for the inferences presented in the relationship between suppliers and customers in the case of the credit term at the BOP; to point out whether the dimensions presented in the food industry are actually only for the food industry or whether they can be replicated in other industries. In the future, it would be interesting to join several segments of the industry in a representative way, as did Giovinazzo (2003), and use the techniques presented in this study to verify its intersectoral results.

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