



PURCHASE BEHAVIOR BY REGION IN DISTRIBUTOR CHANNEL IN COLOMBIA

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ABSTRACT

Objective: The article analyzes the purchasing behavior of the distributor channel by region, taking into account the sales volume and the sizing curve.

Theoretical Framework: The concepts of the distributor channel and the sizing curve are addressed, in the context of the fashion industry.

Method: The data comes from purchases between 2018 and 2019 of 685 distributors of women's push up jeans from the company Organization Bless located in 28 departments of Colombia. The information on the sizing curve is taken from orders placed for 245 different references marketed in the study period. Georeferencing technique is used to locate distributors by purchase volume on a geographic level, likewise, descriptive statistics are used to analyze purchasing behavior by size by region.

Results and Discussion: The majority of warehouses in the distribution channel and the purchase volume are concentrated in the Southwest region of Colombia. A greater consumption of small sizes is evident in the central region of the country, compared to the other regions, while in the Northwestern region its proportion decreases compared to the others.

Research Implications: The results serve as a basis for companies that market their fashion products in the distributor channel, to take into account the purchase volume, as well as demand planning in the sizing curve that adapts to each region.

Originality/Value: The study is carried out in an emerging market such as Colombia, a benchmark in the fashion industry in Latin America. Likewise, the product analyzed is the push up pants, which is characterized by its high demand in the Latin market.

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Keywords: Distributor Channel, Sizing Curve, Fashion Industry, Apparels, Demand Planning.

COMPORTAMENTO DE COMPRA POR REGIÃO NO CANAL DISTRIBUIDOR NA COLÔMBIA

RESUMO

Objetivo: O artigo analisa o comportamento de compra do canal distribuidor por região, levando em consideração o volume de vendas e a curva de dimensionamento.

Referencial Teórico: São abordados os conceitos de canal distribuidor e curva de dimensionamento, no contexto da indústria da moda.

Método: Os dados são provenientes de compras entre 2018 e 2019 de 685 distribuidores de push up jeans femininos da empresa Organização Bless localizada em 28 departamentos da Colômbia. A informação da curva de dimensionamento é retirada de encomendas realizadas para 245 referências diferentes comercializadas no período de estudo. A técnica de georreferenciamento é utilizada para localizar distribuidores por volume de compras em nível geográfico, da mesma forma, estatísticas descritivas são utilizadas para analisar o comportamento de compra por tamanho por região.

Resultados e Discussão: A maior parte dos armazéns do canal de distribuição e do volume de compras estão concentrados na região Sudoeste da Colômbia. Evidencia-se um maior consumo de tamanhos pequenos na região centro do país, em comparação com as demais regiões, enquanto na região Noroeste sua proporção diminui em relação às demais.

Implicações da Pesquisa: O estudo é realizado em um mercado emergente como a Colômbia, referência na indústria da moda na América Latina. Da mesma forma, o produto analisado são as calças push up, demandadas pela população latina.

Originalidade/Valor: O estudo é realizado em um mercado emergente como a Colômbia, referência na indústria da moda na América Latina. Da mesma forma, o produto analisado é a calça push up, que se caracteriza por sua alta demanda no mercado latino.

Palavras-chave: Canal Distribuidor, Curva de Dimensionamento, Indústria da Moda, Vestuário, Planejamento de Demanda.

COMPORTAMIENTO DE COMPRA POR REGIÓN EN CANAL DISTRIBUIDOR EN COLOMBIA

RESUMEN

Objetivo: El artículo analiza el comportamiento de compra del canal distribuidores por región, teniendo en cuenta el volumen de ventas y la curva de tallaje.

Marco Teórico: Se abordan los conceptos de canal de distribuidores y la curva de tallaje, en el contexto de la industria de la moda.

Método: Los datos provienen de las compras entre el año 2018 y 2019 de 685 distribuidores de jeans levanta cola para mujer de la empresa Organización Bless localizados en 28 departamentos de Colombia. La información de la curva de tallaje es tomada de pedidos realizados de 245 referencias diferentes comercializados en el periodo de estudio. Se utiliza técnica de georreferenciación para ubicar los distribuidores por volumen de compra en un plano geográfico, así mismo, se utilizan estadísticos descriptivos para analizar el comportamiento de compra por talla por región.

Resultados y Discusión: La mayoría de almacenes del canal distribuidor y el volumen de compra están concentrados en la región Suroeste de Colombia. Se evidencia en la región del centro del país un mayor consumo de tallas pequeñas, frente a las demás regiones, mientras que en la región Noroccidental disminuye su proporción frente a las demás.



Implicaciones de la investigación: Los resultados sirven de base a empresas que comercialicen sus productos de moda en el canal de distribuidores, para tener en cuenta el volumen de compra, así como la planeación de demanda en la curva de tallaje que se adapte a cada región.

Originalidad/Valor: El estudio se realiza en un mercado emergente como Colombia, referente en la industria de la moda en América de Latina, así mismo, el producto que se analiza es el pantalón levanta cola que se caracteriza por su alta demanda en el mercado latino.

Palabras clave: Canal Distribuidores, Curva de Tallaje, Industria de Moda, Prendas de Vestir, Planeación de Demanda.

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1 INTRODUCTION

The fashion industry represents a GDP of \$3 trillion globally. In Colombia there are 6,500 companies that generate 750,000 jobs (Fashion United, 2020) and the companies that participate in this sector have a production chain positioned in the region for its quality, workmanship and exclusive designs. In recent years, the sector had a 6% share of industrial GDP (Procolombia, 2020).

Knowing the demand to plan production is a differentiating factor against the competition (Kai *et al.*, 2022; Kuo & Xue, 1998; Tehrani & Ahrens, 2016), this allows to keep the indicator of unsold inventories at low levels, where the average of the sector is 25% (Sun *et al.*, 2008). The fashion industry compared to other sectors has a higher level of complexity, as additional variables such as season, region, and size by reference intervene (Ni & Fan, 2011; Tehrani & Ahrens, 2016).

Based on the above, it is defined as a problem the levels of inventories not sold by collections in the distribution channel of women's jeans, a problem that has been addressed through accurate sales forecasts. For this reason, the present investigation has as added value, to analyze the purchasing behavior of the distributors channel by region, taking into account the sales volume and the size curve of the product jean type push up or lift tail.



2 THEORETICAL FRAMEWORK

2.1 DISTRIBUTOR CHANNEL

The distributor or retail channel has different formats to take advantage of the experience of users with the product, it is made up of multi-brand or single-brand warehouses (Castrogiovani & Justis, 1998; Moore *et al.*, 2000).

Distributors can make more profit by buying globally, however fashion demand is changing and accelerating, forcing local suppliers to have more agile inventory replenishment (Pal & Byrom, 2003).

Supply chain management of apparel suppliers and distributors should be synchronized and aligned with dynamic demand patterns (Bruce *et al.*, 2004; Ketchen & Giunipiero, 2004).

Achieving product availability requires knowing demand well and being flexible to respond with variety of fashion and agile lead times (de Matos *et al.*, 2023; Doyle *et al.*, 2006; Fernie & Sparks, 1998). For this reason, knowing the demand well and achieving a rapid supply allows to guarantee a product availability to the customer (Bruce *et al.*, 2004; Kishore *et al.*, 2023).

2.2 SIZE CURVE

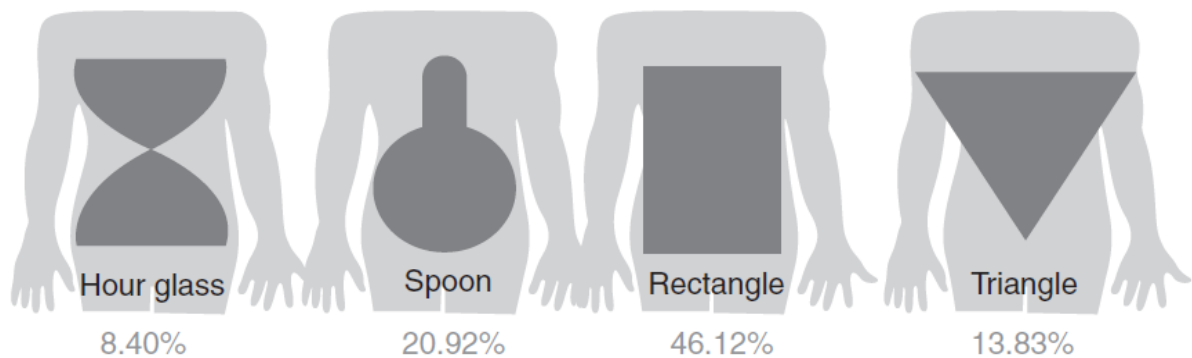
The main factor affecting the distribution of the curve is the demographic characteristics of customers, which can affect values depending on the region where the product is marketed (Mpampa *et al.*, 2010). All clothing brands try to achieve a perfect balance, between the range of sizes and most sizes and shapes of their target audience (Zakaria & Ruznan, 2020). In 2005, North Carolina State University conducted the first body shape analysis in conjunction with a leading manufacturer of technical fit mannequins, using Size USA data from 6,318 scanned women (Gribbin, 2014).

After portraying the shape of three-dimensionally as virtual bodies and physical mannequins, it was found that only about 8.4% of American women actually had an hourglass shape, the shape that the vast majority of clothing brands used to design their products (See Figure 1), this is evidenced, for example, by plus-size women, who have long felt neglected by traditional retail and are frustrated by the lack of clothing that fits their body shape (Gribbin, 2014).



Figure 1

Percentage of women by body shape result Project Size USA 2003



Source: Liu et al. (2018)

Fitting the size is one of the most important key factors for a person to choose a garment, for example, average women try on 15 jeans before buying one, trying to make sure it has the best fit. Recognizing this, the Levi's brand, between 2004 and 2006, placed body scanners in 12 flagship stores to collect data on body shape and help shoppers find the jeans that best fit while there. Levi's had long acknowledged that body shapes varied widely and that consumers wore jeans very differently, depending on their personal preferences (Gribbin, 2014).

Other studies, such as that conducted on online shoppers by found that one of the biggest obstacles to increasing online clothing sales is shoppers' difficulty finding the right size, with the trouser category, the garment, being the most challenging for shoppers to find a suitable size and fit (Kuzmichev & Cheng, 2020; Eccles, 2011; Fits.me, 2012).

3 METHODOLOGY

The method is deductive-logical, the sample comes from the purchases between 2018 and 2019 of 685 distributors of jeans raises tail for women of the company Organización Bless located in 28 departments of Colombia. The size curve information is taken from orders placed from 245 different references marketed in the study period. Georeferencing technique is used to locate distributors by purchase volume in a geographical plane, likewise, descriptive statistics are used to analyze the purchasing behavior by size by region.



4 RESULTS AND DISCUSSIONS

The customers of the distributor channel are multi-brand warehouses, which buy from different suppliers, garment product categories to stock the sales points. In Colombia it is a channel that is served through vendors who are assigned by geographical areas, who visit customers six times a year, offering a different collection for each season.

4.1 CHARACTERIZATION SAMPLE DISTRIBUTORS

Table 1 shows the total sample of distributors of the company Organización Bless, 685 with presence in 28 of the 32 departments of Colombia, where most of these are in Valle del Cauca (16.35%); Antioquia (8.47%); Nariño (6.72%); Santander (6.13%) and Atlántico (5.69%).

Table 1

Distributors by Region and Department

Region	Department	Distributors (Cant)	Total %
Northwest	Antioch	58	8.47%
	Atlantic	39	5.69%
	Bolivar	31	4.53%
	Cordoba	29	4.23%
	Cesar	27	3.94%
	Sucre	21	3.07%
	Choco	15	2.19%
	Magdalena	14	2.04%
	Total	234	34.16%
Northeast	Santander	42	6.13%
	La Guajira	22	3.21%
	North of Santander	15	2.19%
	Arauca	13	1.90%
	Total	92	13.43%
Center	Bogota	31	4.53%
	Boyaca	5	0.73%
	Cundinamarca	6	0.88%
	Total	42	6.13%
Southwest	Valle del Cauca	112	16.35%
	Nariño	46	6.72%
	Risaralda	30	4.38%
	Huila	18	2.63%
	Jacket	16	2.34%
	Tolima	14	2.04%
	Putumayo	12	1.75%
	Quindio	12	1.75%
	Cauca	11	1.61%
	Caldas	9	1.31%
	Total	280	40.88%
Southeast	Target	26	3.80%
	Casanare	8	1.17%
	Guaviare	3	0.44%



<i>Total</i>	<i>37</i>	<i>5.40%</i>
<i>Grand total</i>	<i>685</i>	<i>100.00%</i>

Source: Authors

4.2 SALES VOLUME CHARACTERIZATION BY REGION

The distribution of sales is mostly concentrated in the south-west and north-west region, with 55.4% and 25.3% of the total units sold, respectively (See Table 2). Although the number of units in 2019 decreased, the proportion of sales in each region does not show significant variation.

Table 2

Distribution of sales by Region and Year

Region	Year Sale				Total	
	2018		2019		Units	%
	Units	%	Units	%		
NorthWest	86,048	24.7%	60,962	26.3%	147,010	25.3%
North East	34,550	9.9%	23,746	10.2%	58,296	10.1%
Center	12,146	3.5%	4,778	2.1%	16,924	2.9%
SouthWest	197,842	56.9%	123,782	53.3%	321,624	55.4%
SouthEast	17,398	5.0%	18,803	8.1%	36,201	6.2%
Total	347,984	100.0%	232,071	100.0%	580,055	100.0%

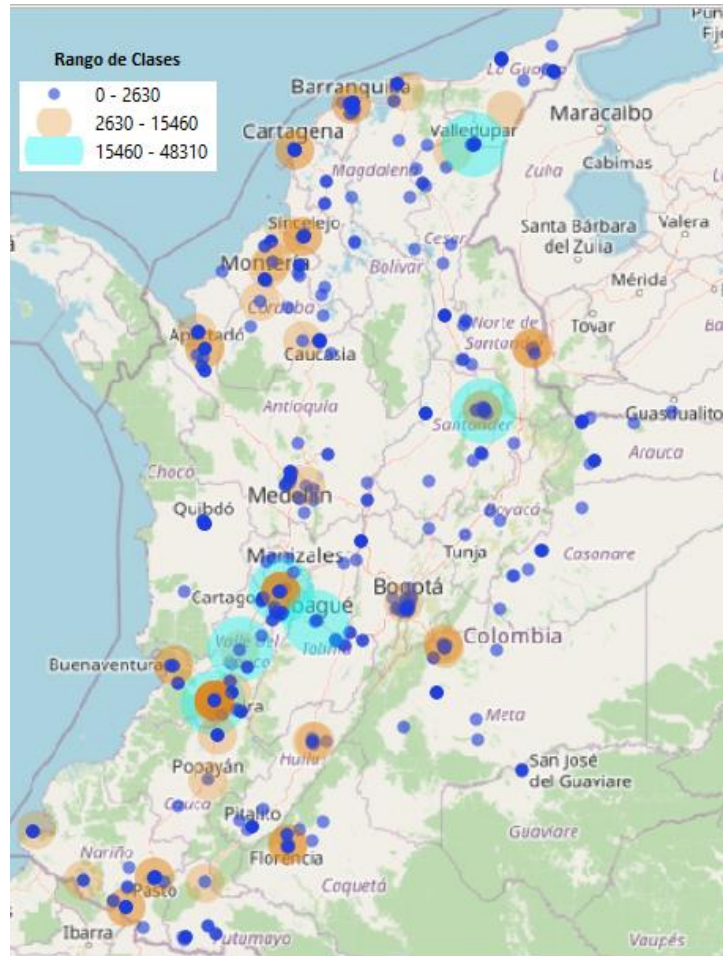
Source: Authors

Figure 2 shows the purchase volume by georeferenced distributor on the map of Colombia. To facilitate visualization, the sample was classified into three class ranges, using the Jenks Natural Cuts method, where the data are divided into classes whose limits are established where there are considerable differences between the values of the data. As a result, it was obtained that 616 distributors bought less than 2630 units accumulated in 2018 and 2019; 62 customers buy between 2630 and 15460 units; and 7 distributors have purchases greater than 15460 units accumulated in the two years. Most of the large distributors are located in the Southwest region.



Figure 2

Geo-referencing of distributors by purchase volume



Source: Authors

4.3 ANALYSIS OF PURCHASING BEHAVIOR BY SIZE AND REGION

Table 3 shows the body size system used in the present study, composed of six different sizes: 6, 8, 10, 12, 14 and 16. You can also see the measurement ranges in centimeters of the waist and hip, taken as a basis to design the dimensions of each size.

Table 3

Body size system used in the study

Size	Size	Waist (cm)	Hip (cm)
6	S (Small)	67 - 70	92-96
8	S (Small)	71 - 74	97-100
10	M (Medium)	75 - 78	101-104
12	M (Medium)	79-82	105-109
14	L (Large)	83 - 86	110-114
16	L (Large)	87-90	114-118

Source: Authors

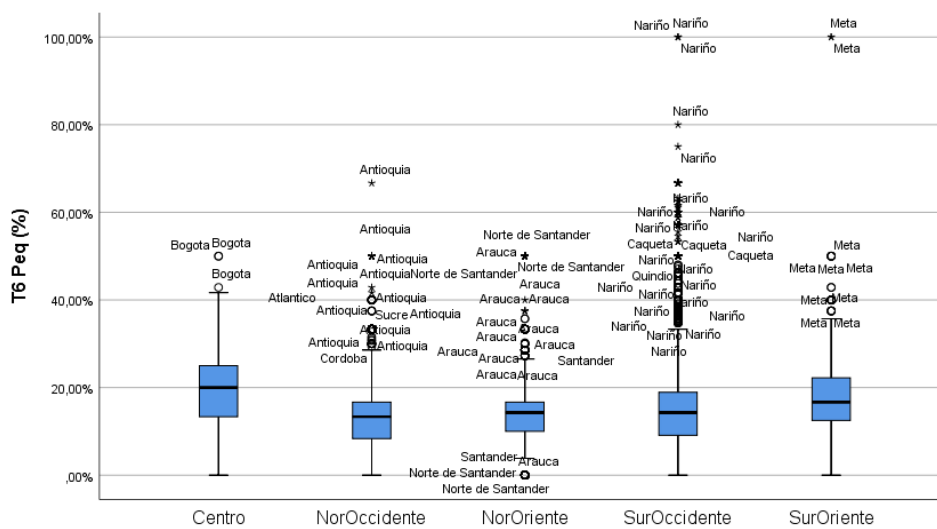


4.3.1 Analysis of purchasing behavior by small sizes

Figure 3 shows the distribution of the data from Size 6 of the two periods in a Boxplot diagram, where it is observed that all zones have different distribution in this Size. In the northern areas, the data are more concentrated around 18% of the proportion of the total of all sizes. The other areas have a dispersion of data. We also see atypical data in the North area generated by sales in Antioquia, Arauca and Norte de Santander; while in the south, by sales in Nariño and Meta.

Figure 3

Size 6 Distribution by Region and Department

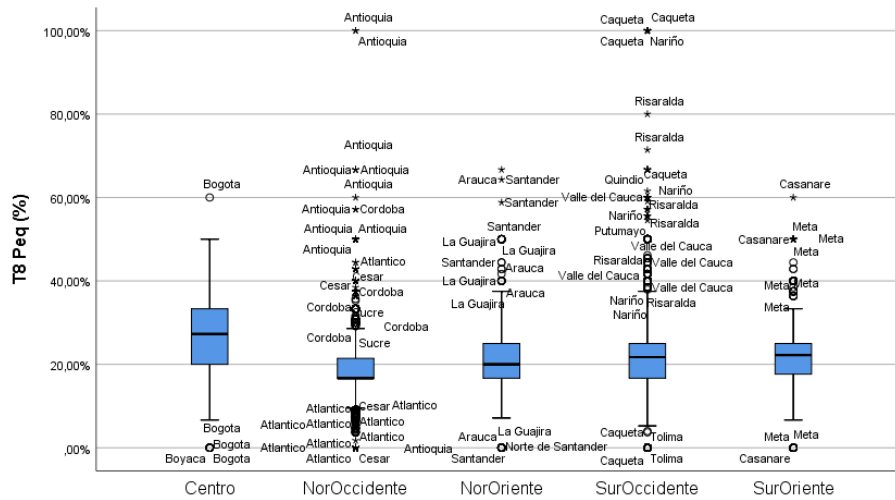


Source: Authors

Size 8 data in the Central zone have a symmetric distribution with high variability; in the Northwest zone the distribution is positive asymmetric with data concentrated in the median of 16.67%, and presents sales with atypical data in Antioquia. The eastern areas and the southwest, present distribution of 50% of the similar data, evidenced in the sizes of the boxes as shown in Figure 4. Atypical data are observed in southern areas in the departments of Caquetá, Nariño, Risaralda, Casanare and Meta.



Figure 4
Size 8 Distribution by Region and Department

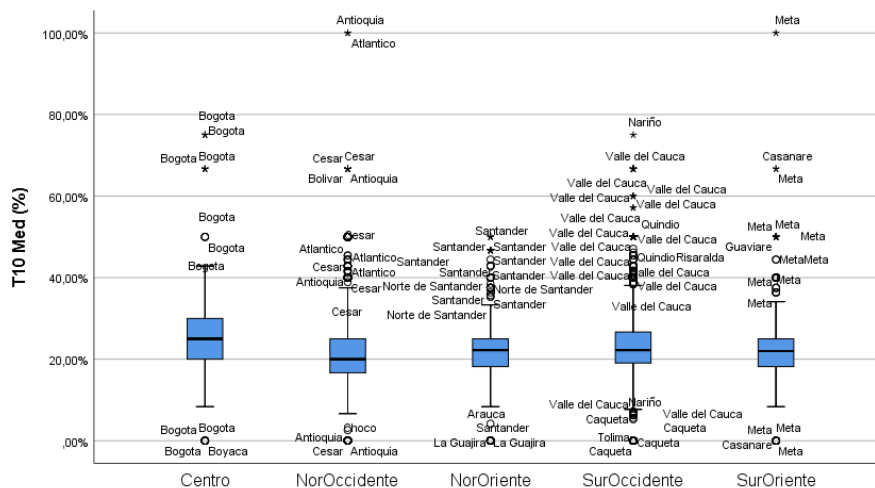


Source: Authors

4.3.2 Analysis of purchasing behavior by medium size

Figure 5 shows that the data of Size 10 in the Center area have a symmetric distribution with values of proportion higher than the other areas, presents some atypical data in Bogotá. The other areas have median between 20% and 22%, with positive asymmetric distribution, except the Northeast. Atypical data are observed in southern areas in the departments of Caquetá, Nariño, Valle del Cauca, Casanare and Meta; and in the north in Antioquia and Atlántico.

Figure 5
Distribution Size 10 by Region and Department



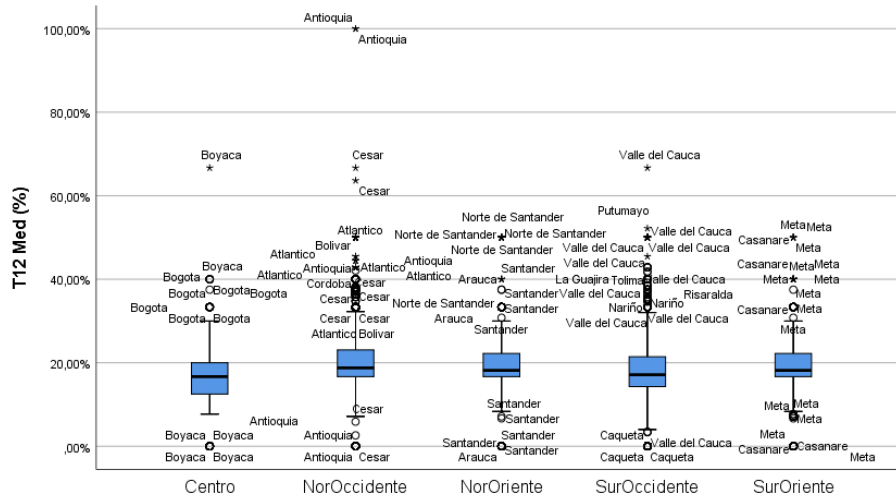
Source: Authors



Figure 6 shows the distribution of the Size 12 data in a Boxplot diagram, where differences are observed between them in all sizes. Atypical data are observed in southern areas in the department of Valle del Cauca; and in the north in Antioquia and Cesar.

Figure 5

Size 12 distribution by Region and Department



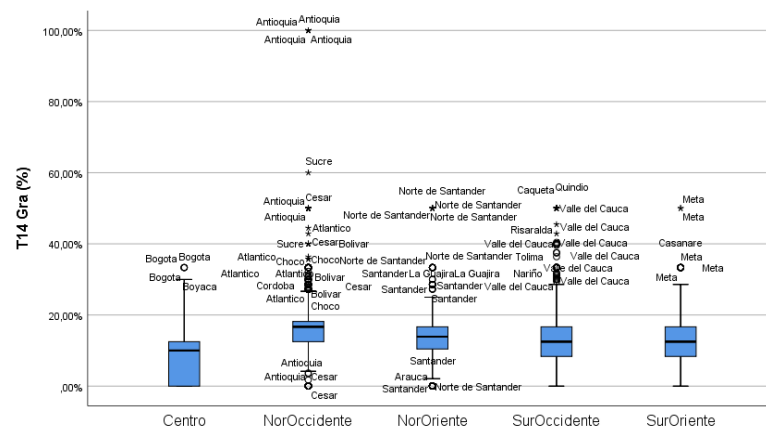
Source: Authors

4.3.3 Analysis of purchasing behavior by large sizes

Figure 6, presents in Boxplot the distribution of Size 14 by regions, where 50% of the data in the Center region are between 0% and 15% with negative asymmetric distribution with high dispersion in values between the low values.

Figure 6

Size 14 distribution by Region and Department

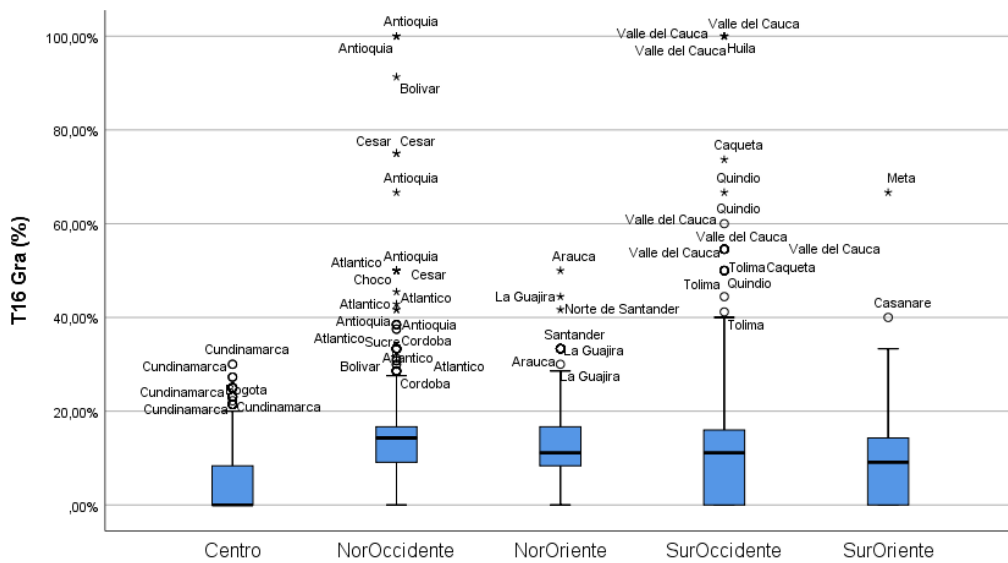


Source: Authors



In Figure 7, the distribution of Size 16 is presented in Boxplot chart, where 50% of the data in the Center are between 0% and 8% with negative asymmetric distribution with high dispersion in values between the low values. Distributions in the southern parts of the country have concentrated 50% of their data between 0% and 16%, with high dispersion of data in low percentage proportions.

Figure 6
Size 14 distribution by Region and Department



Source: Authors

5 CONCLUSION

Most of the warehouses of the distribution channel and the volume of purchase are concentrated in the Southwest region of Colombia, specifically in the department of Valle del Cauca. Although there was a decrease in the number of units purchased in 2019 compared to the previous year, the proportion of the sale in each region does not show significant variation.

In the central region of the country there is a higher consumption of small sizes compared to the other regions, while in the Northwest region it decreases its proportion compared to the others. A study is proposed to analyze the relationship between the size curve and the climate of the region, since apparently in regions of climate with temperatures below 15 °C average concentration in small sizes is greater than 50% of the total, likewise in climates with temperature above 32 °C, the concentration of large sizes is greater than 50%.

The results of the research provide basic information to design strategies in the product supply planning of women's clothing, taking into account the heterogeneity in the distribution



of the size curve in the multi-brand distributors channel for each region in countries with contexts such as Colombia.

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