EFFICIENCY ANALYSIS OF THE DISTRIBUTION SYSTEMS OF FLOWERS AND ORNAMENTAL PLANTS IN THE STATE OF SÃO PAULO

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ABSTRACT

This article signals efficiency and inefficiency aspects of four wholesaler distribution systems of flowers and ornamental plants, determined by means of key-indicators. Four different wholesaler distribution system categories were evaluated: a traditional public (SPT1), a traditional public with a permanent market of flowers and ornamental plants (SPT2), a cooperative (SC) and a private (SPR), represented respectively by CEAGESP, CEASA Campinas, Veiling Holambra and FLORANET company. The study was accomplished through questionnaires applied to the producers, employees of the distribution systems and consumers of flowers and ornamental plants. The sample size was determined using a simple random probability technique. The results obtained through the analyses of the key-indicators, permited to identify for each of the wholesaler distribution systems, the aspects in that article should be improved to increase the overall efficiency and, competitiveness of the sector.

Key words: flowers and ornamental plants, wholesaler distribution systems, efficiency analysis.

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1 Introduction

The flowers and ornamental plants industry stands out as an activity with high profitability per unit area. It is also of intensive labor, which in turn, can contribute to lower the rural exodus as the use of small properties in enhanced. Another important characteristic is its contribution to the small property domestic budget.

Brazil has been showing in the last years an increase in the volume of financial flow and in the intern demand and exported in the last years. The overall evaluation of the market indicates that the consumption potential is very high. However, the agroindustrial system, as a whole, needs larger organization. The lack of integration among the agents in the system limits the activity development.

Among the several segments of the productive chain, the distribution deserves more attention, because it is the link that approaches the producers and the final consumer, making the of negotiation exchanging transactions. The flowers and ornamental plants distribution sector in Brazil are composed by wholesalers and retailers, being the wholesaler distribution accomplished through several systems, as the public and private wholesalers centers.

Nowadays, the flowers and ornamental plants industry in São Paulo State are responsible for approximitily 60% of the Brazilian market and also, this is the place where the main wholesaler distribution systems, which appeared as a consequence of the development of the sector, are found. The article analyzes four different distribution systems categories: a traditional public (SPT1), a traditional public with a permanent market of flowers and ornamental plants (SPT2), a cooperative (SC) and a private (SPR), represented respectively by CEAGESP, CEASA Campinas, Veiling Holambra and FLORANET company.

The four distribution systems categories showed differences regarding investments in physical structure and operational costs, commercialization time, number of employees involved, consumer

satisfaction, among others, that should take them to show different efficiency indexes. Distribution systems that operate inefficiently gather larger costs that burden both the producer and the consumer.

The present article has the objective to signal efficiency and inefficiency aspects of those distribution systems, determined by means of key-indicators, as the idleness time per employee, revenue per total area, contribution of the distribution system in the maintenance the product quality and the degree of consumer satisfaction.

To understand the importance of this analysis to start will be characterized the four different distribution systems categories.

2 Wholesaler Distribution

2.1 Traditional Public Wholesaler Distribution System (SPT1)

The traditional public wholesaler distribution systems (SPT1) is represented in this article by CEAGESP, that was established in 1969, from the coalition of the "Central Estadual de Abastecimento S.A" (CEASA) with the "Companhia de Entrepostos e Armazéns Gerais de São Paulo" (CEAGESP).

Nowadays, flowers and ornamental plants distribution in CEAGESP happens in the "Praça da Batata, Cebola e Flores" (PBCF, "Potato, Onion and Flowers Square") and "Mercado Livre do Produtor" (MLP, "Producer Free Market"), in São Paulo state. According to research developed by Vieira & Albertini[3], in MLP there are 1.101 "permissionários"[4], being 850 producers, 250 distribuition companies and 1 cooperative (Holambra). In the PBCF exists 240 "permissionários", being 190 producers and 50 distribuition companies.

Among the critical points existent in the process of flowers commercialization in CEAGESP, can be pointed the lack of fiscalization

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[3] VIEIRA, D. P., ALBERTINI, M. A. (CEAGESP. Companhia de Entrepostos e Armazéns Gerais de São Paulo, São Paulo). Personal Communication, 1999.
[4] The "permissionario" terminology is used for that individual that possesses a box (booth) in the sale space, pays the condominium and, therefore, has permission to commercialize the products inside the structure (Claro, 1998).

of the marketed amounts; lack of classification standards; lack of safety and the long commercialization period (Arruda et al., 1996).

2.2 Traditional Public Wholesaler Distribution System With a Permanent Market of Flowers and Ornamental Plants (SPT2)

The traditional public wholesaler distribution systems with a permanent market of flowers and ornamental plants (SPT2) is represented in this article by CEASA Campinas.

The market appeared as an alternative to commercialization in CEAGESP and keeps growing every month. This is a permanent market that counts with 504 "boxes". 384 of those "boxes" have an individual area of 24 m^2 and 120 are in bidding process. The total area is 30.000 m^2 (until the end of 1999 this area was 18.872 m^2). Now SPT2 has 302 "permissionários", being 238 producers (76 of cut flowers, 88 of vase flowers and 74 of ornamental plants), 20 wholesalers and 44 salers that supply accessories for the sector.

2.3. Cooperative Wholesaler Distribution System (SC)

The cooperative wholesaler distribution system (SC) is represented in this article by Veiling Holambra. According to Rooyen & Optiz (1997), it is a system that administers the flowers sales structure through a daily electronic auction with decreasing prices (70% of the sales) and the intermediation in negotiated contracts (represents 30% of the sales).

The auction process is based on a daily section. The producers, associated to the Agricultural Cooperative Holambra have their whole production commercialized in Veiling's auction (Aki, 1992). The intermediation in negotiated contracts is an instalment of services to accomplish purchase and sale contracts of products among producers and buyers for scheduled deliveries. In this transaction case, it is not necessary that the product goes by Veiling. In majority, the intermediation in negotiated contracts are annual and prices are established and the

amounts of the products are fixed (Claro, 1998).

The key piece of the system is the auction, because it stimulates the competition among buyers for the acquisition of the products, giving transparency to this market. The absence of this system would put flower producers in an unfavorable negotiation position, given the perishable nature of the product. Veiling presents the electronic control of the credit given to the buyers and each buyer has a maximum credit limit avoiding acquisitions above that permissible sailing credit and minimizing the risks of the operation (Rooyen & Optiz, 1997).

2.4 Private Wholesaler Distribution System (SPR)

The Private wholesaler distribution system is represented in this article by FLORANET.

The Reijers family has been working with flower production since 1972, estabilishing their trademark by 1994, named Reijers Group (today the name has changed to FLORANET). The company, with headquarters in Holambra-SP, for reasons of disagreement with Holambra's Cooperative politics, decided to separate and to create its own distribution system. The new system, inaugurated in October/1998, is divided in 3 different companies: the first is responsible for the commercial area, the second is responsible for the administrative area and the third is responsible for the distribution (logistics operator).

The total area built is 1400 m². Now SPR has 8 producers and 120 associated customers.

The operation of the distribution system happens as follows: the production units pass their product availability, feeding a database for the commercial area. Most of the time, customers make requests by telephone or fax. Some customers make the request directly in the sales office. The requests are sent to the respective production units that receive the request from the customers, identifying them by labels with code bars. They are sent to the logistic central, from each producer directly to the

customer, when the products have already been sold. By this moment the customers are able to pick them up.

Table 1 summarizes some information regarding the location, inauguration year, number of producers and consumers, revenue accumulated from January to October 1999 and the total area used for the commercialization of the four wholesaler distribution system categories.

Table 1. Information about SPT1, SPT2, SC and SPR.

Distribution system	Location	Inaugu-ration year	Number of producers	Number of consumers	Revenue (R$) [4]	Total area (m²) [5]
SPT1	São Paulo SP	1969	1.040 [1]	[3]	124.993.149	56.000 [6]
SPT2	Campinas SP	1993	238 [2]	3.721	46.614.643	18.872 [7]
SC	Holambra SP	1989	162	295	60.818.437	31.000
SPR	Holambra SP	1998	8	120	11.099.000	1.400

Source: Data of the research
[1] In SPT1 exists 1.341 "permissionários" , being 1.040 producers, 300 distribuition company and 1 cooperative.
[2] The SPT2 exists 302 "permissionários", being 238 producers, 20 wholesalers and 44 sell accessories for the sector.
[3] Don't exist a customers directory.
[4] Accumulated revenue from January to October 1999.
[5] Total area used for commercialization
[6] This area includes the MLP (26.000 m²) plus the area of the PBCF (30.000 m²).
[7] Total area built until 1999. Starting from 2000, the system has 30.000 m² of area built.

3 Methodology

The basic goal point of this article is to discuss efficiency and inefficiency aspects of the four distribution systems: SPT1, SPT2, SC and SPR. In order to do that, the following key-indicators were established:

1) idleness time /labor per day;

2) distribution system revenue /total area;

3) contribution of the distribution system in the maintenance of the product quality;

4) degree of consumer's satisfaction.

The referring data to each of the key-indicators were obtained through a descriptive research. Questionnaires were initially applied to some producers and consumers of the distribution systems. From these previous the minimum sample size was calculated. For that was used the methodology mentioned in Mattar (1996), related to a simple random probability technique[5].

The form adopted to signal in which aspects a certain distribution system is more efficient than the others was to compare the results of each key-indicator.

The distribution system that presented the largest value for the key-indicator 2 and the smallest value for the key-indicator 1 was more efficient than the others in those aspects. For the key-indicator 3, the distribution system that presented the smallest frequency of product handling and invested most in specific structures for maintenance the flowers and ornamental plants quality was the most efficient. In the key-indicator 4, greatest frequency in relation to consumer's satisfaction and coherence between price and quality indicated the highest efficiency.

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[5] The producer's sample size of the SPT1, SPT2 and SPR reached the minimum sample size determined by the statistical procedure. However, for the producers of SC and consumers of the four distribution systems, was interviewed a smaller number of individuals that determined by statistical procedure (reliability level of 95% and maximum error of 5% was adopted). This is happened due to limitation in time and financial resources restricts for the accomplishment of other interviews.

4 Results and Discussion

The first key-indicator measured the idleness time per labor per day, as show in Table 2:

Tabela 2. Idleness time /labor per day.

Distribution system	SPT1	SPT2	SC	SPR
hours/labor	3hrs45min	2hrs44min	[1]	0hrs

Source: Research data
[1] Data not available for this distribution system.

Among the distribution systems in which was possible to obtain information about idleness time regarding the employees, the SPT1 was the most inefficient, followed by the SPT2. In the systems, it was common to observe lazy employees, waiting the consumer to accomplish the commercialization. In SPR, the employees keep working in full time in the commercialization.

The second key-indicator showed the distribution system revenue per total area used for the commercialization (Table 3).

Table 3. Distribution system revenue[1]/total area used for the commercialization.

Distribution system	SPT1	SPT2	SC	SPR
R$/m^2	2,232.00	2,470.00	1,962.00	7,927.00

Source: Research data
[1] Calculation accomplished with the distribution systems accumulated revenue from January to October 1999.

The most efficient distribution system in terms of revenue per total area used for commercialization was SPR. In spite of the low revenue, compared to the other systems, SPR uses a smaller area for the

commercialization (Table 1). The SPR works with commercial and administrative conduct and logistics orientation. The producer only transports the product to the system when it is already sold. When arriving in the system the remained product is carried out by the buyer or, in some cases, stocked (refregerat room) for a short period of time. For these reasons, large storage area is not a necessary.

The others presented a quite similar key-indicator revenue per total area used for the commercialization. All products that will be marketed stay in the systems until sale, demanding a greater storage area.

The third key-indicator that was used to signal efficiency and inefficiency aspects of those distribution systems, referred to the contribution of the distribution systems in the maintenance of product quality. For Slack, cited by Riguetti & Fusco (1999), quality means "to do things right", in summary, produce in agreement with the customer's specifications, process and norms. Quality reduce costs and provide greater reliability.

Tabela 4. Number of times that the product is handled.

Alternative	SPT1		SPT2	
	f^1	%	f	%
Any time	0	0.0	0	0.0
1 time	0	0.0	0	0.0
2 times	6	13.0	5	11.9
3 times	19	41.3	28	66.7
More than 3 times	21	45.7	9	21.4
Total	46	100	42	100

Source: Research data
[1] Frequency of the producers answers

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The key-indicator contribution of the distribution system in the maintenance the product quality was measured by the number of times that the product is handled and the existence of specific structures that contributed to the quality of the product in the analyzed systems. Table 4 shows the number of times the product is handled in the distribution systems from discharge to the shipment to the consumer.

In the SC and SPR physical contact with the product doesn't exist, because all movement, from the discharge to the shipment to the consumer, is accomplished in appropriate carts that already arrive loaded from the production.

The handling of flowers and ornamental plants results in quality loss. The products have their durability in risk because of their perishable nature, subject to climatic variations. This problem gets even worse with the number of handlings increasing in the commercialization phase.

Table 4 shows that 45.7% of the producers that distribute by SPT1 handle the product more than 3 times and that 66.7% of the producers that distribute by SPT2 handle the product 3 times. This excessive handling practiced by the producers causes the quality loss to the products. The SC and SPR systems that contribute with the product quality, because the handling of the flowers doesn't exist.

In relation to the existence of structures that contribute in maintaining the product quality, the SC invests in refrigeted room, acclimatized patio and platform for shipment and discharge of the products. SPR invested in refrigeted room and platform, but also in a laboratory for post-harvest analysis. In SPT1 and SPT2 specific structures for maintenance the product quality do not existe.

Gathered that the SPT1 and SPT2 are inefficient in relationship to the key-indicator contribution of the distribution system in the maintenance the product quality when compared to the other systems, due to the excessive handling and the inexistence of specific structures to maintain the product quality.

The last key-indicator refers to the degree of consumer's

satisfaction. Plossl, cited by Riguetti & Fusco (1999), pointed out that to keep the company competitiveness in the market it is necessary to develop external indicators that might facilitate the comparison among the supplied product with customer's expectation. The customer's expectation embraces several aspects, not only the product performance, but also how the company disposes the product in regard to delivery schedule and the attendance given to the customer. The company function is to solve customer's problem, that is, attend his needs.

The key-indicator was measured by the consumer's satisfaction in relation to the product offered, coherence between price and quality and other problems presented in the distribution systems.

Figure 1 shows the consumer's satisfaction in relation to the product quality. In Tables 5 and 6 the price paid for the product, its coherence with the quality, as well as the reasons for this incoherence are evaluated. Other problems presented in the distribution systems according to the consumers can be analyzed in Table A1 - Appendix.
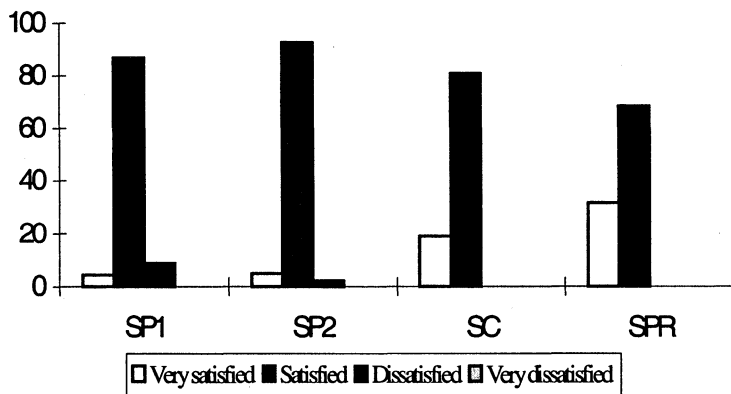

Figura 1- The consumer's satisfaction in relation to the product quality (% of the total interviewees).
Source: Research data

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The analysis of the informations inserted in Figure 1 demonstrates that most of the consumers are satisfied in relation to the product quality offered by the distribution systems. It is important to point out that there is an incidence of 8,7% dissatisfied consumers in the SPT1.

Table 5. Price paid for the product in coherence with the quality.

Alternative	SPT1 f^1	%	SPT2 f	%	SC f	%	SPR f	%
Yes	25	54.3	32	78.0	30	81.1	16	84.2
No	21	45.7	9	22.0	7	18.9	3	15.8
Total	46	100.0	41	100.0	37	100.0	19	100.0

Source: Research data
[1] Frequency of the consumers answers.

Table 6. The reason of the incoherence between price and quality.

Alternative	SPT1 f	%	SPT2 f	%	SC f	%	SPR f	%
Lack of product quality	11	52.4	5	55.6	6	85.7	1	33.3
Little durability	2	9.5	0	0.0	0	0.0	0	0.0
High price	2	9.5	2	22.2	1	14.3	1	33.3
Lack of standardization	5	23.8	2	22.2	0	0.0	0	0.0
Other	1	4.8	0	0.0	0	0.0	1	33.3
Total	21	100.0	9	100.0	7	100.0	3	100.0

Source: Research data

However, when the consumer was questioned about the coherence offered by the systems for both product price and quality the analysis Tables 5 and 6 indicates some interesting aspects.

The consumers of the SPT1, 45,7% of the interviewees, don't think that the price paid for the product is coherent with it's quality. The main

reasons were the low quality and lack of standardization in the offered products. In relation to the other systems, those percentages were smaller. For the interviewees consumers in the SPT2, SC and SPR, 22%, 18,9% and 15,8% respectively, don't think the price paid for the product coherent with it's quality. For those systems, the main reason was low quality of the products offered.

Other problems presented in SPT1 are the frequency by the same time that consumers, retailers, wholesalers and final consumer pay the same price for the products and lack of an organized parking lot with more space. In SPT2 consumers were not satisfied with the schedule of opening, because the beginning of the expedient could be antecipated. In compensation, in relation to SC and SPR, most of the consumers didn't present any problem (see Table A1 - Appendix).

The analysis of the key-indicator degree of consumer's satisfaction, shows that all systems are efficient. However, it was observed a lower efficiency in relation to the coherence between quality and price of the products, frequency by the same time that consumers, retailers, wholesalers and final consumer pay the same price for the products and lack of an organized parking lot with more space in SPT1 and to the schedule of opening in SPT2.

5 Conclusions

The present article signalled efficiency and inefficiency aspects of the wholesaler distribution systems, by means of key-indicators.

A "magic formula" for measuring the company efficiency doesn't exist. Even so, the experience shows that the number of important indicators is small. In this article, for example, four key-indicators were used to show how the distribution systems were acting and if they were moving in the right direction.

The first group of key-indicators in this article (indicators 1 and 2) measured the productivity of the distribution systems. Thus, the production

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factor was related to - total area used for the commercialization - to the revenue of each system, as well as the idleness time per labor in the commercialization period, with the following main conclusions:

· the SPT1 and the SPT2 possess a high number of salespersons (producers) and employees involved in the commercialization with highest idleness and lowest productivity;

· the SPR was the most efficient in terms of revenue per total area used for commercialization, as a result of the electronic commercialization model and logistics orientation.

The second group of key-indicators in this article (indicators 3 and 4) measured issues related with the quality of the product and the consumer's satisfaction. Thus, the contribution of the distribution system in the maintenance the product quality and the degree of consumer's satisfaction were analyzed, with the following main conclusions:

· the SC and the SPR presented larger contribution in the maintenance the product quality with methods and practices that reduce mechanical damages and specific structures to maintain flowers and plants quality as cold room, acclimatized patio and laboratory for post-harvest analysis of the material. The other systems were less efficient, because they didn't invest in specific structures for the quality control;

· the SC and the SPR registered a great degree to the consumer's satisfaction in relation to the product quality, coherence among price and quality and the other researched factors; the other systems also presented a good degree to the consumer's satisfaction with some exception registered in the Table A1 - Appendix.

The question on which would be the best key-indicator is debateble subject even among the best expert administrators in the area. None of the measures is individually perfect, because all incorporate an error margin and practically all are appropriate.

It is important to stablish indicators of the considered system under a systemic approach, looking for combined measures of efficiency. Thus, the combination of both parameters productivity and quality to generate

several efficiency measures.

In summary, the important point in the signalized efficiency and inefficiency aspects presented in this article, was not the absolute magnitude of the founded indicator's for the distribution system, but the tendency - what mathematicians call "slope of the curve". With this information, the manager of each wholesaler distribution system can observe the inefficient, and look for improvements in its performance.

6 References

AKI, A.Y. **O Sistema Veiling na comercialização de hortifrutigranjeiros.** Holambra, 1992. 80p.

ARRUDA, S.T.; OLIVETTE, M.P.A.; CASTRO, C.E.F. Diagnóstico da floricultura do Estado de São Paulo. **Revista Brasileira de Horticultura Ornamental**, v.2, n.2, p.1-18, 1996.

CLARO, D.P. Análise do complexo agroindustrial das flores do Brasil. Lavras, 1998. 103p. Dissertação (M.S) - Universidade Federal de Lavras.

MATTAR, F.N. **Pesquisa de marketing.** São Paulo: Atlas, 1996. 270p.

RIGUETTI, M.A.; FUSCO, J.P.A. Indicadores de desempenho operacional em empresas fabricantes de pequeno e médio porte. In: SIMPÓSIO DE ADMINISTRAÇÃO DA PRODUÇÃO, LOGÍSTICA E OPERAÇÕES INDUSTRIAIS, 2., São Paulo, 1999. **Anais.** São Paulo: FGV, 1999. p. 304-316.

ROOYEN, S.R.V.; OPTIZ, R. Veiling - leilão eletrônico de flores da Holambra. **Preços Agrícolas**, n.127, p.24-26, maio 1997.

Appendix

Table A1. Other problems presented by the wholesaler distribution systems according to the consumers.

Alternative	SPT1 f^1	SPT1 $\%^2$	SPT2 f	SPT2 $\%$	SC f	SC $\%$	SRP f	SRP $\%$
Other	22	47.8^3	14	34.1^4	12	32.4^5	0	0.0
Operation schedule	8	17.4	19	46.3	0	0.0	0	0.0
Lack of safety	5	10.9	2	4.9	0	0.0	0	0.0
High price of the products	3	6.5	0	0.0	0	0.0	0	0.0
Any problem	3	6.5	3	7.3	14	37.8	10	52.6
Difficulty in finding the product	2	4.3	2	4.9	4	10.8	8	42.1^6
Delays in the product delivery	1	2.2	1	2.4	4	10.8	0	0.0
Lack of standardization in the products	1	2.2	2	4.9	0	0.0	0	0.0
High administrative rate	1	2.2	0	0.0	4	10.8	0	0.0
Location	1	2.2	0	0.0	0	0.0	1	5.3
Total of answers ^{7}	47	102.2	43	104.8	38	102.6	19	100.0
Total of interviews	46	100.0	41	100.0	37	100.0	19	100.0

Source: Data of the research

[1] Frequency of the consumers interviewees' answers.

[2] The percentage of the alternatives was perfomed considering the total answers.

[3] Frequency by the same time that consumers, as retailers, wholesalers and final consumer pay the same price and lack of an organized parking with more space.

[4] Lack of an organized parking with more space, inexistence of an adequate place for shipment and mix of consumers (wholesalers and retailers) that pay the same price for the products.

[5] Short period for payment and high interest rate.

[6] Restricted amount of products and varieties offered by the distribution system.

[7] Average of answers for interviewees = 1,02 (SPT1); 1,04 (SPT2); 1,03 (SC) and 1,1 (SPR).