

ANALYSIS OF TRADE: IMPORT OF PEARS IN INDIA (2015-2018)

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Abstract

The purpose of this document is to compare two different import scenarios and analyze whether there are changes in the organization of consignees or importers of pears. We use HHI to determine the structure of the imported sector. The FTPI is used to analyze the competition in the companies that export a product. In addition, the DMFA was applied to complement the coefficients described.

This study provides information about trade decisions of countries interested in exporting to India and assesses the relevance of business intelligence in world trade.

Additional key words: Country origin, Consignee, Varieties, Price and Volume

JEL Classification: C13, F14, Q17

1. Introduction

The world trade in apples and pears is relatively stable in recent years (+ 0.2%): with a strong growth dynamic in Asia (+ 5.4%) and the Middle East (+ 3.1%), while imports decrease in Europe (-0.7%), Russia (-2.3%), Africa (-8.4%), America Latin (- 0.9%), USA UU. And Canada (-1.8%).

The growth of imports in India (+ 8.8%), the main market in this commercial region, is interesting in Asia (Table 1.a). In this Asian country, fruit imports have an annual growth rate of 1.7% (Table 1.b), but pome fruit (apple and pear) is very important in volume. India is a medium-term strategic country for world fruit trade, particularly very interesting for pome fruit (Harmonized system code 0808).

Some studies perceive this because of the potential growth in demand if import tariffs decrease (Lee et al, 2020), and significant changes in the commercial organization of importers in apples are verified (De Pablo Valenciano et al, 2018).

An study on the fruit consumer in India concludes that if fruits are stored under adequate refrigeration, they are labeled to show the country of origin and at a price the presence of intrinsic factors such as taste and nutrition improves perceptions towards the purchase of imported fruits (Kathuria and Singh, 2015; Lê and Pagès, 2010). Fruit consumption in India is highly correlated with consumer income, with the middle and lower income groups being more likely to purchase bananas, while the high income group prefers to buy bananas, mangoes, apples and oranges. It also increases the consumption of other fruits import (Kavitha et al, 2016).

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India offers promising export growth prospects for U.S. agriculture¹ with a large and rapidly expanding middle class, rising disposable incomes and shifting consumption patterns toward higher-value agricultural commodities.

Indian authorities ban China's agricultural products in June 2017², a recent development. The plagues of apples, pears and Tagetes (the flower of the marigold) are the origin of the restriction. Opportunity to export pears from the United States, Europe and the southern hemisphere. marigolds (Tagetes spp.)

India offers promising prospects for import growth for apples and pears, with a large and rapidly expanding middle class, growing disposable income and changing consumption patterns towards higher value agricultural products. From this point of view, the purpose of this document is to assess whether there are changes in the trade of pears, although the imported volume has low growth (+ 0.3%), compared to that of Apples that have dynamic growth (+ 9.7%).

This information would help to understand if structural changes are only present in India in the face of an increase in international demand, or otherwise, due to the complexity of current trade. World trade tends to grow in Asia, and the lack of strategic analysis of its commercial organization is the novelty of this article.

2. World Imports of Pears and Apples

Table 1.a – World import of pears and apples fresh (tons)

Market/Years	2014	2015	2016	2017	2018	Var. Annual
Total	10.081.604	9.884.179	10.369.720	10.893.947	9.691.772	0,2%
Asia	1.959.389	2.019.609	2.490.911	2.685.451	2.400.866	5,4%
- india	220.878	215.670	280.397	348.635	298.844	8,8%
- Iraq	230.936	254.030	243.642	375.511	273.734	6,1%
- Bangladesh	168.649	177.081	230.658	233.539	201.518	4,8%
- Hong Kong	127.029	165.442	168.252	164.360	167.093	3,9%
Europe	3.296.829	3.593.937	3.378.788	3.588.241	3.134.423	-0,7%
Russia Fed.	1.591.955	1.058.938	1.378.240	1.447.501	1.191.926	-2,3%
Midle East	911.167	922.735	975.875	1.189.310	974.964	3,1%
USA & Canada	511.560	464.718	527.407	473.387	448.632	-1,8%
Latin America	1.113.501	1.068.829	1.030.738	1.060.777	1.050.458	-0,9%
Africa	705.260	753.242	583.874	449.123	489.141	-8,4%

Sources: ITC calculations based %on UN COMTRADE and ITC statistics.

¹ <https://www.fas.usda.gov/data/india-agricultural-trade-expanding-export-opportunities-amid-persistent-limitations>

² <http://economictimes.indiatimes.com/news/economy/foreign-trade/india-suspends-fruits-from-china-after-they-fail-pesticide-tests/articleshow/58707215.cms>

Table 1.b) – India import of fruit fresh (thousand tons)

Code Product label		2014	2015	2016	2017	2018	Var. Annual
	Total	1767.370	1809.312	1667.601	1764.363	1989.006	1.7%
'0801. Coconuts, Brazil nuts and cashew nuts, fresh or dried, whether or not shelled or peeled		907.803	972.396	730.971	706.328	877.348	-2.8%
'0804. Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried		347.782	326.207	359.021	386.898	425.245	4.6%
'0808. Apples, pears and quinces, fresh		220.878	215.670	280.397	348.635	298.844	8.8%
'0802. Other nuts, fresh or dried, whether or not shelled or peeled (excluding coconuts, Brazil nuts ...		205.344	199.222	182.452	203.125	207.928	0.3%
0808,10. Apples fresh		204.570	193.692	246.808	330.605	280.094	9.7%
0808,30. Pears fresh		16.308	21.978	33.589	18.030	18.750	0.3%
'0805. Citrus fruit, fresh or dried		49.960	50.123	57.201	50.295	86.437	10.6%
'0810. Fresh strawberries, raspberries, blackberries, back, white or red currants, gooseberries and ...		9.975	18.242	30.820	34.914	51.866	44.2%
'0806. Grapes, fresh or dried		18.792	20.259	19.713	23.270	27.951	8.0%
'0813. Dried apricots, prunes, apples, peaches, pears, papaws "papayas", tamarinds and other edible ...		4.267	4.681	3.236	6.690	7.972	16.0%
'0809. Apricots, cherries, peaches incl. nectarines, plums and sloes, fresh		1.709	1.962	3.057	3.201	3.809	18.7%
'0811. Fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen, whether or not ...		0.529	0.140	0.177	0.341	1.048	30,1%
'0807. Melons, incl. watermelons, and papaws (papayas), fresh		0.326	0.408	0.534	0.592	0.480	8,8%
'0812. Fruit and nuts, provisionally preserved, e.g. by sulphur dioxide gas, in brine, in sulphur ...		0	0.001	0.021	0.066	0.057	62,1%
'0814. Peel of citrus fruit or melons, incl. watermelons, fresh, frozen, dried or provisionally preserved ...		0.001	0.001	0.001	0.008	0.021	38,7%
'0803 . Bananas, incl. plantains, fresh or dried		0.004					

Sources: ITC calculations based on UN COMTRADE and ITC statistics.

3. Methodology

The data were obtained from Port Nhava Sheva in India, compiled by Business Intelligence Observatory (www.cif-businessintelligence.com), for the years 2015 and 2018. Entry by this port accounts for 54% of India's imports (46.7% in 2014), with the following market share by country of origin: 63.4% United States; 76.5% Iran; 71.5% Italy; 64.6% Chile; 50.9% New Zealand; 38.5% China and 36.9% Afghanistan, among the main suppliers..

To determine the structure of the importer apples sector we used the Herfindahl-Hirschman Index (HHI). The HHI measures the level of concentration in a given sector, is a well-known and commonly accepted indicator of market competition [1],

$$HHI = \sum_{i=1}^n \left(\frac{X_i}{X} 100 \right)^2 \quad [1]$$

Where $\frac{X_i}{X}$ = participation of the i-th company in the market; and n= number of firms in the sector.

On the basis of the EU Commission guidelines and HHI values, the given sector can be characterized as unconcentrated, moderately concentrated or concentrated (Deodhar et al, 2006). Possible outcomes go from 0 to 10.000, this index reading based on USA regulations that is performed according to the following classification: $HHI < 1000$ = low concentration level; $1000 < HHI < 2000$ = moderate concentration level; and $HHI > 2000$ = high concentration level.

The significance of the HHI approach can be appreciated by the number of articles that use it in different areas such as agribusiness export (Khaksar et al, 2014), consumer demand (Stablein et al, 2011), internationalization (Elango, 2011), new product development (Veflen and Sallis, 2010) and branding (Damoiseau et al, 2011).

Analysing the changes in the policy of purchases to suppliers (in the case of importers) is a good commercial indicator of competition. Similar to exports is analysing the market share of each company. For this reason, the Foreign Trade Policy Index (FTPI) is used, adapting the model to analyse the competition in the exporting companies of a product (De Pablo Valenciano et al, 2014). The objective of this methodology is to analyse the changes between two scenarios in the import policy, and consequently, the index takes the "market share of a company in a country origin or region of import" as the numerator and the "import quota" of the country for that product as denominator [2].

$$FTPI = \left(\frac{IP_{kij}}{M_{kj}} \right) / \left(\frac{IP_{ki}}{M_k} \right) \quad [2]$$

where IP_{kij} = import purchases of product "k" by company "i" in region of origin "j"; M_{kj} = total import of product "k" by region of origin "j"; IP_{ki} = import purchases of product "k" from company "i"; and M_k = total import of product "k";

If a company's share is higher than the average at the level of the importing country, this indicates that these are comparative advantages because the market share exceeds the average share and vice versa if it is lower. By combining FTPI and the trend of market share, we obtained the commercial policy map of the company analysed for a product (in our case apples) and a trend is learned of the changes between regions of origin of imports. This helps us to understand the dynamics of the commercial changes in a country like India. This is an analysis of companies that market a product. This adaptation of the FTPI in a scientific article will be unpublished.

To analyse the commercial management, a data matrix was used for the years 2015 and 2018, containing the importing companies in the sector and the following variables as columns: immortalized volume by region of origin, average CIF price by region of origin, total volume imported and total average CIF price.

The congruence of the matrices makes it possible to analyse the consistency in the companies' behaviour during the same periods, which becomes a measure to assess the trade management at the company's level. Several approaches allow us to analyse the congruence of the companies' behaviour at different times. One of these approaches is the Pearson correlation of the elements outside the diagonal of a correlation matrix for 2016 and 2017. Another approach is the vectorial correlation coefficient (RV coefficient) that measures the similarity between symmetric square matrices. The range of possible values for each coefficient suggested ranges from -1 to 1. Based on the resulting patterns, we performed permutations based on simulations to estimate the likelihood of these occurring at random. The probability obtained after 10,000 simulations was below 0.0001. Therefore, the hypothesis that the patterns obtained could be random was rejected, which points to a common underlying structure.

To supplement the coefficients described, the Dual Multiple Factor Analysis (DMFA) was applied, where the grouped structure of the data was taken into account, balancing their influence on global results (De Pablo Valenciano et al, 2017b). For this paper, we compared two different time spans with the same variables on companies or individuals, and this accompanies other recent research on the treatment of data of this kind (Abascal et al, 2013). A cluster analysis is elaborated by employing the agglomerative method UPGMA (Unweighted Pair Group Method with Arithmetic Mean) with the same information used in the Dual Multiple Factor Analysis, (DMFA) in order to detect common groups in each one of the considered years (8).

4. Results and discussion

Sector's organizational structure

The Indian pear import market is of low commercial concentration, less than 1,000 points (the main cause of commercial development of pears in China, South Africa and the United States). In a context in which India increased its international purchases and the average CIF import price (Table 2). China offers mostly non-European varieties -Asian-, United States variety D'Anjou, South Africa variety Packhams and Belgium variety Conference.

Table 2 – Indicators of the trade organization by country of origin

Country origin	2016 Th kg	2017 Th kg	2016 USD/kg	2017 USD/kg	2016 Consignee	2017 Consignee	2016 HHI	2017 HHI
China	5451	7398	0,75	0,82	26	29	961	712
South Africa	4127	5444	1,19	1,28	23	28	883	845
United States	2532	2.29	1,52	1,52	20	20	1.016	912
Belgium	285	198	0,82	0,95	2	4	9.097	4.917
Italy	0	62		1,15		3		2.015
New Zealand	0	21		0,84		1		10.000
Total	12395.	15654	1,09	1,16	34	39	699	612

Source: own elaboration with information of Business Intelligence Observatory

Supplier policy to major importers

The four largest importers in terms of purchasing volume have a market share of 40% in the years 2016 and 2017 (IG International, N.G.K. Trading Company, D.J. Exports PVT Ltd and Suri Agro Frsh PVT Ltd). These importers show significant changes in the dynamics of their supply policy in 2017. IG International comparative advantages in the purchase of pears from Belgium; South Africa main supplier. Purchases in 2017 increased to the United States and declined in China (Figure 1). N.G.K. Trading Company with comparative advantages in the purchase of pears from South Africa; its main supplier. Purchases in 2017 increased to China and the United States (Figure 2). D.J. Exports PVT Ltd with comparative advantages in the purchase of pears in the United States; its main supplier is China. Purchases in 2017 increased to South Africa (Figure 3). Suri Agro Frsh PVT Ltd with comparative advantages in the purchase of pears in China. Small increase in purchases in 2017 to South Africa, reducing imports from the United States (Figure 4).

Figure 1 - Supplier policy in the import of IG International

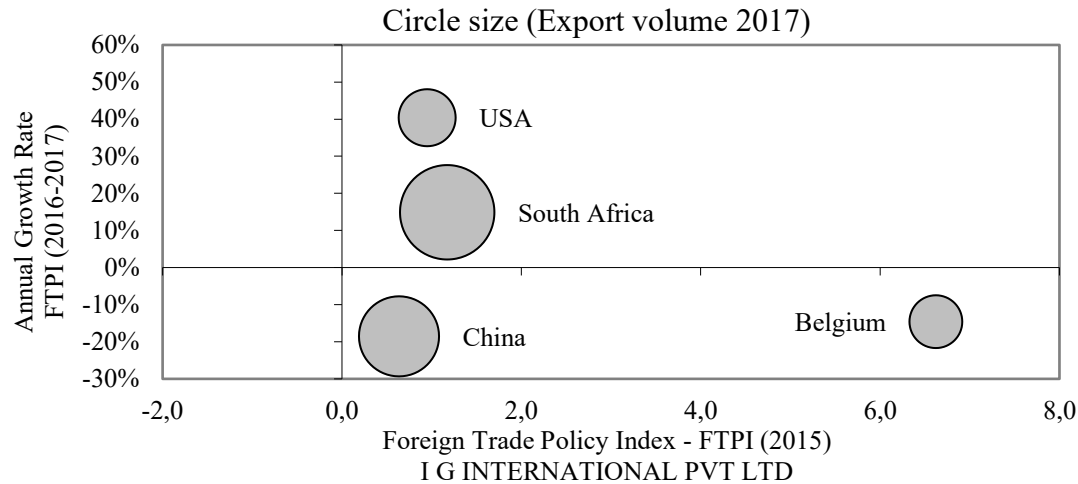


Figure 2 - Supplier policy in the import of N.G.K. Trading Company

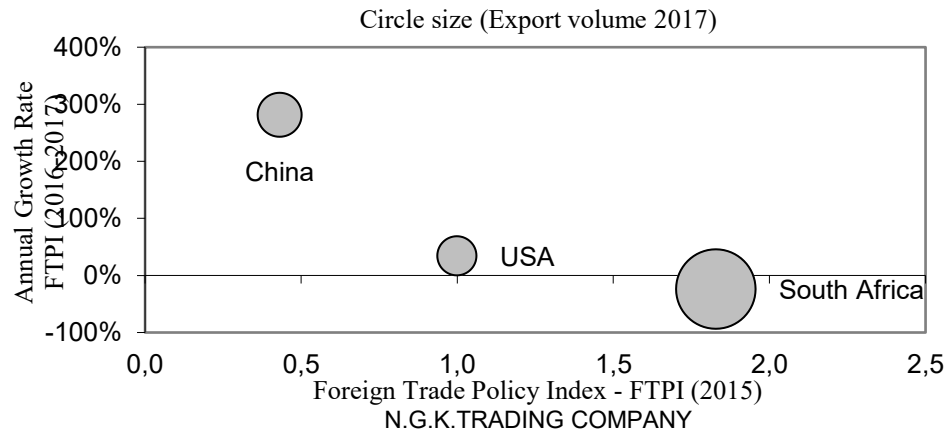


Figure 3 - Supplier policy in the import of D.J. Exports PVT Ltd

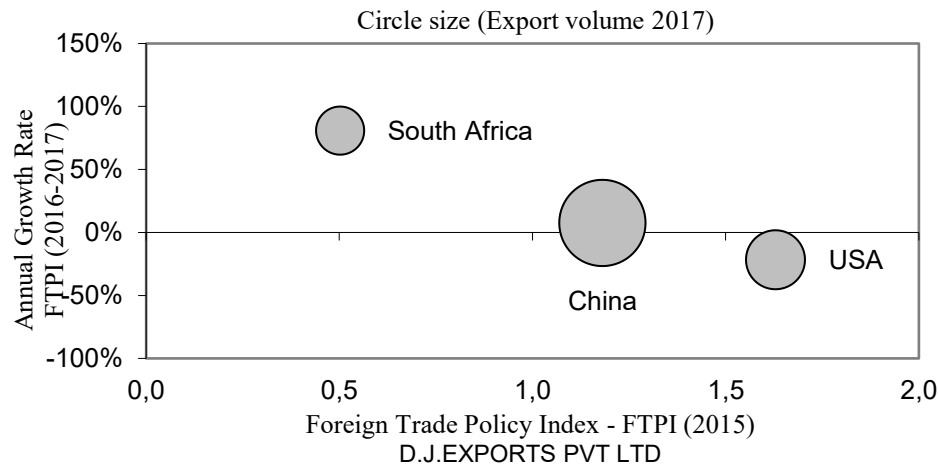
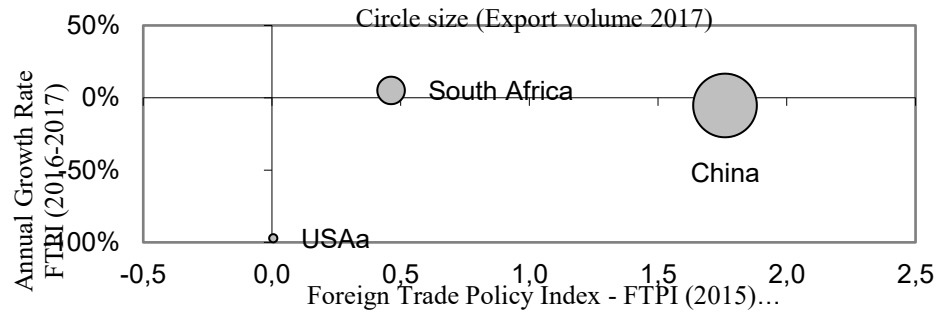


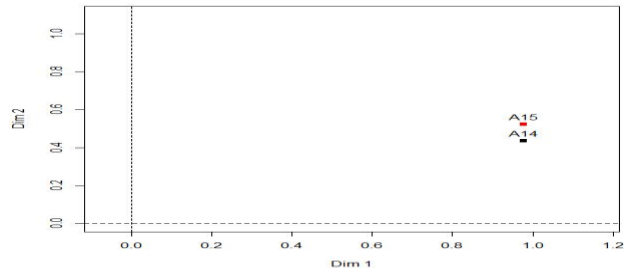
Figure 4 - Supplier policy in the import of Suri Agro Frsh PVT Ltd



Global commercial import supply strategy

The congruence of the data matrices considered for these time intervals has been evaluated by both the Pearson correlation coefficient (0.67) and the RV coefficient (0.92), which are within the established parameters and with "P" less than 0.001 which is statistically significant. The comparison between both scenarios is valid. Performed permutations based on simulations to estimate the likelihood of these happening at random have shown that the probability obtained after 10,000 simulations was below 0.0001. Therefore, we rejected the hypothesis that the patterns obtained could be random, which points to a common underlying structure.

Figure 5 - Trade projection with DMFA of changes in consignee (red 2015, black 2014)



The DMFA result is that it does not show significant changes in the variables analyzed between 2016 and 2017 (Figure 5). The biplot graphs allow a better visualization of the gradients of the variables in scenario 2016 (Figure 6) in relation to scenario 2017 (Figure 7).

Figure 6 – Biplot of the variables in the scenario 2016

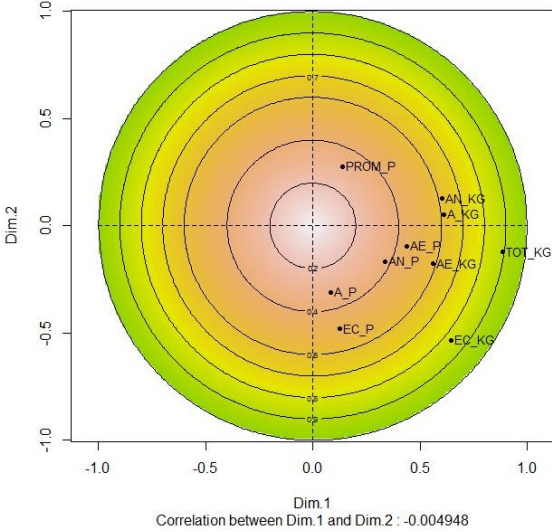
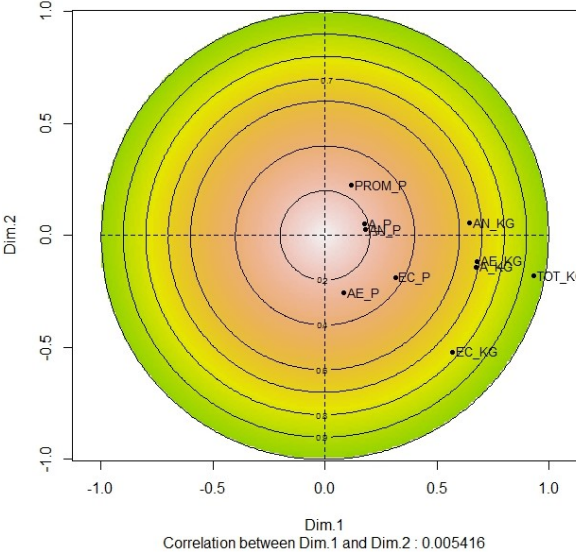


Figure 7 – Biplot of the variables in the scenario 2017



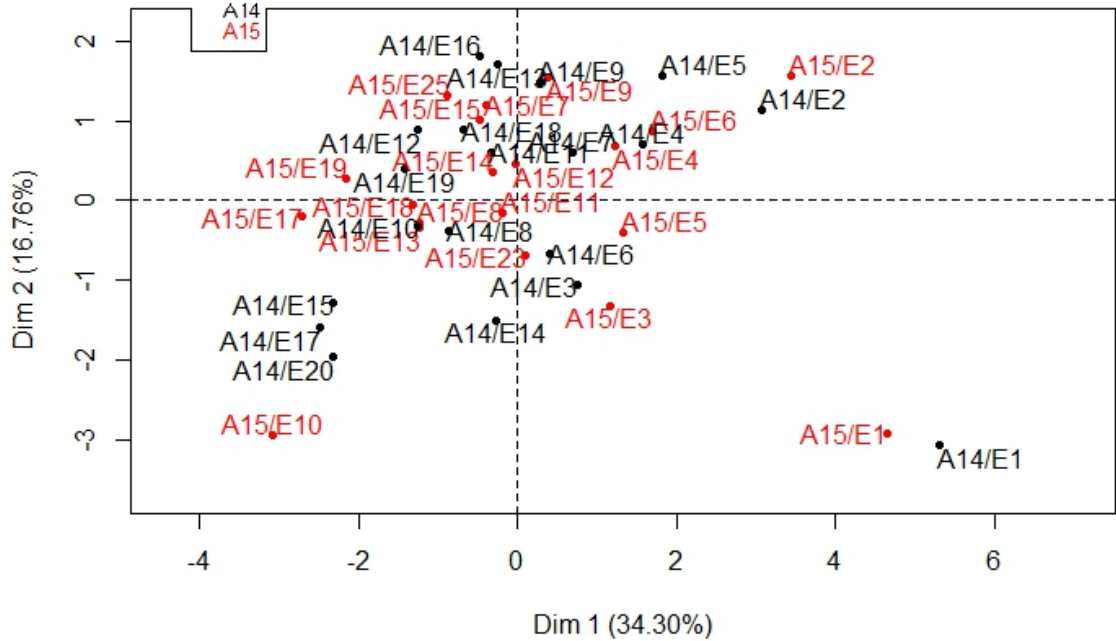
The analysis of the variables explains 51.06% of the changes in the structure of the Indian pear imports. The analysis of the main components in the consignees or importers, between 2016 and 2017, makes it possible to visualize those that register a significant statistical change between both scenarios (Figure 8).

IG International PVT Ltd (E1) increased import volume from Africa in 2017. DJ Exports PVT Ltd (E2) did not increase the volume of purchases, but increased imports from Africa and decreased the purchase to North America in 2017. The company GT Fruitech

PVT.Ltd. (E5) increased purchases from Africa and East Asia, without changing the volume imported from North America in 2017, which explains the change from upper to lower right quadrant. The company Gajumal Mulchand Fruit PVT Ltd. (E6), increased purchases in East Asia and North America, explaining the change in position from the lower right to the upper quadrant.

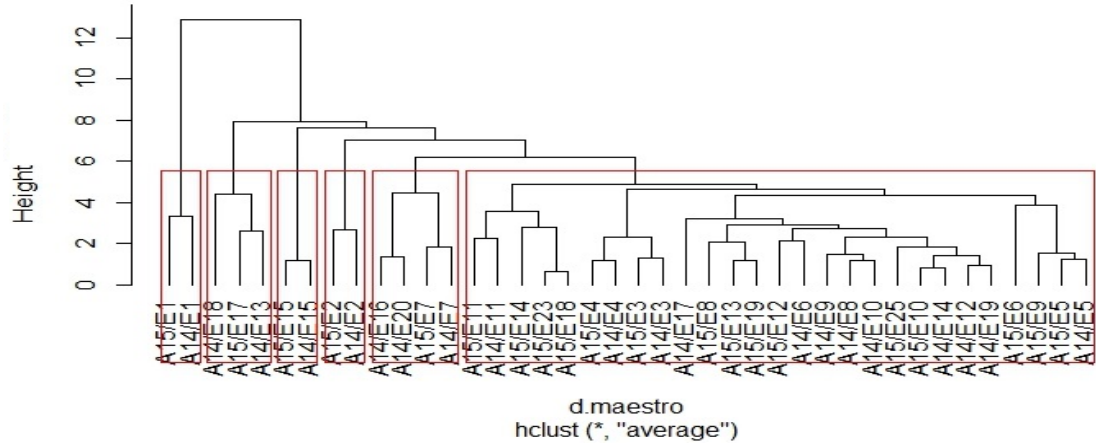
Other interesting changes observed in the lower left sector (Figure 8), example the company Adani Agrifresh Ltd (E10) decreased its international purchases; and the Millennium Agro Technologies India (E20) company that stopped importing in 2017. The company MGR Fruits PVT Ltd (E17) imported less than East Asia, and also decreased purchases in North America. The company P.M.Traders (E15) increased purchases in Africa and reduced them in North America; Explaining that his position for the left quadrant is lower than upper in 2017.

Figure 8 – Variables factor map of companies (red/A15:2017; black/A14:2018)



The complementary analysis through the cluster or dendrogram graph (Figure 9); Displays six groups. The larger group, where most of the consignees are, presents small changes between the two scenarios (2016 vs. 2017) that overlap each other. This helps to understand the low level of change recorded globally in DMFA (Figure 5).

Figure 9 - Tree diagram comparing the consignee strategy import



Importers that differ in the market of India, constituting a group each individually are: E1 (IG International PVT Ltd), E2 (D.J.Exports PVT Ltd) and E15 (P.M.Traders).

The remaining two groups are, on the one hand, purchases in 2016 of E18 (SRC Overseas) and E13 (Royalasia Marketing International), together with those of E17 in 2017 (MGR Fruits PVT Ltd). On the other hand, the purchases in 2016 of the companies E16 (D.B. International) and E20 (Pappu International), in addition to the company E7 (Aayush Impex). The volume of purchases has changes when comparing the two scenarios, also the origin of the pear.

Several articles have studied the difficulty of accessing destination markets for fresh fruit. Lu Hsu y Jong-Wenn (2004) used the source–position–performance framework to analyse the competitiveness and consumer preferences of U.S. fruits versus Taiwanese fruits. The results showed that consumers did not value the characteristics of American fruit, proposing to inform consumers about them in order to increase their consumption.

On the other hand, the work of De Pablo Valenciano et al (2017a) focused its analysis on the impact of the 2007/2008 global economic crisis on South Africa's performance as a pear exporter who, despite reducing its export activity, was the least affected among the main pear exporters.

With regard to the analyses of the main pear substitutes (apples and stone fruits), health and flavour are the main factors that explain the consumption of them. With regard to apples, consumption rises in varieties that are sweeter (soluble solids) more acid and firmer (Iglesias, 2010; 2013). Sweetness and grassy aroma were the main drivers of liking for fresh nectarines and peaches in terms of consumer preferences (Delgado et al, 2013). Also, it is interesting to point out the main forms of innovation in the pear sector, such as the harvesting of new pear varieties in countries that have never been planted in before or the introduction of earlier strains of varieties that exhibit an increasing demand (B.C. Ministry of Agriculture, 2015).

4. Conclusions

The market for commercially imported fresh pears is of low concentration in India, the backbone is the sale of pears from China, South Africa and the United States (Table 2).

The structure of the sector registered a small change between 2016 and 2017 (Figure 5). A detailed analysis, by importer, reveals that all show changes in their purchasing policy (Figure 9), but overlap each other. This explains why the structural change is small in India, as an industry average. The purchasing policy of the main importers confirms the significant variations between the 2016 and 2017 scenarios (Figures 1, 2, 3 and 4)

The low commercial concentration and the dynamic changes in the organization of the sector at the level of companies in detail, allow to comment that it is a complex model. This is the result of the interrelation of the volume imported monthly, the origin of the pear - it implies different varieties -, logistics, quality and sanitation of the fruit.

The empathy of international trade is the priority in the management of future trade, understanding the structure of imports and their movements. Good business decisions require empathy in a globalized economy, a teaching that transmits research, to be more competitive.

Finally, this document is an information contribution for commercial decisions of countries with an interest in exporting to India and an apprenticeship on the relevance of business intelligence in world trade.

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