INTERNATIONAL JOURNAL ON ECONOMICS, FINANCE AND SUSTAINABLE DEVELOPMENT

IJEFSD

Available online at www.researchparks.org

RESEARCH PARK

Journal homepage: www.researchparks.org/

Seasonal Impact on the Demand of Finished Products of Sualkuchi Silk Industries: Application of Dummy Variable Technique

Debtosh Chakraborty
S. S. College, Hailakandi, Assam, India

A B S T R A C T

Very often a year is divided into several seasons with respect to the demand of certain product. This study laid emphasis on the demand of Mulberry Silk product of Sualkuchi silk industries and Dummy Variable Technique is used to to test the effect of seasonal fluctuation on the demand of Mulberry Silk Product.

A R T I C L E I N F O

Article history:
Received 23 May 2021
Received in revised form
25 Jun 2021
Accepted 30 Jul 2021

K E Y W O R D S:
Mulberry Silk Product, Sualkuchi Silk Industry, Dummy Variable Technique, Seasonal swing, Makhela-chadar.

1. Introduction

It is true that most of the small scale industries are based on the indigenous culture, which the symbol of our heritage and past glory. Such a symbol of heritage which carry forward through small scale industry is the silk industry of Sualkuchi of Assam, which is also known as the `Manchester of Assam'. Sualkuchi is situated on the North bank of the river Brahmaputra, about 35 kilometres away from Guwahati. Sualkuchi is a multicast town and a subdivision of the Kamrup district. Since 17th century, having a long traditional history, Sualkuchi is the prime center of silk weaving.

There are mainly 12 lakh throw flying shuttle handlooms in Assam, but most of them are domestic and used to wave a few meters of cloths for the use of their family members. There are also some semi commercial looms producing some meters of fibers for the market during off hours of the house wives

E-mail address: info@researchparks.org
Peer review under responsibility of Emil Kaburuan.
ISSN (electronic): 2620-6269/ ISSN (printed): 2615-4021 . Hosting by Research Parks All rights reserved.

doing independently or under so called *Mahajons*, who supply yarn to the poor weavers.

The growing demand for fabrics and their increasing prices encouraged a few *Tanti* of Sualkuchi to introduce weaving commercially and they started weaving factories engaging hired wage weavers. Today the factory system with semi- automatic Fly shuttle handloom has already been extended to entire Sualkuchi and nearly 74percent of the households of the town are being engaged with commercial weaving of handlooms.

Today Sualkuchi holds the unique position in Assam and the silk industries of Sualkuchi are producing the apparels from *Pat* or *Mulberry* silk, *Muga* silk, *Eri* silk and *Tasar* silk of various design and colours.

The products of Assam silk industry now a days are on high demand even to the non-Assamese people during their own traditional festivals, beyond Bihu the main festival of the Assamese people. The major silk products of Sualkuchi cluster are *Mekhela* (lower part of traditional women apparel) and *Chador* (upper part of traditional women apparel), Blouse, *Sharee* (women apparel), *Khasi* dress, *Than* (simple pile of cloth) etc. Basically, *Eri* silk is considered as the silk of less affluent section of Assamese people and popularly used to manufacture the warm cloths, (Chakraborty *et al*, 2010).

2. Statement of the problem

Assam is basically silk oriented and it is the only state in India that cultures all the four major varieties of silk, namely, *Muga*silk, *Pat* or *Mulberry* silk, *Tasar* silk and *Eri* silk (Phukan, 2012). It is true that most of the small scale industries exist in the traditional form and symbolize our heritage and past glory. Such a symbol of heritage which carries forward through small scale industry is the silk industry of Sualkuchi of Assam, which is also known as the `Manchester of Assam'. Sualkuchi is situated on the North bank of the river Brahmaputra, about 35 kilometers away from Guwahati.

As in the target selling seasons the producers of Sualkuchi remain busy to sell the finished products, so they generally avoid importing the raw materials (*Mulberry silk yarns)* in target selling seasons and they mainly import the raw materials during the pre target selling seasons, viz in May to August and in November and December (Field survey).

The demand of Silk product rises on the eve of *Durga puja,* marriage season and Bihu, *i.e.* in September & October and from January to April and the demand of products fall from May to August and in November and December (Baishya, 2003 and Saikia, 2012) in the retail market. So to meet the consumers' demand the producers of Sualkuchi silk industries required to supply their products before to start the festival sales and with respect to the demand of silk products of Sualkuchi, a year is divided into 4 seasons, namely -

Season 1: January to March

Season 2: April and May

Season 3: June to September

Season 4: October to December

Here, Season I and Season III are the high selling seasons of silk products at Sualkuchi and Season II and season IV are the low selling seasons (Field survey).

3. Review of literature

Baruah (2016) introduces Assam as a state of sericulture and weaving. Also the author suggests the Integrated Business Model as a solution of the problems of Assam silk market. In his study the author states that Assam silk industry is an unorganized industry. People who are engaged in production and

E-mail address: info@researchparks.org
Peer review under responsibility of Emil Kaburuan.
ISSN (electronic): 2620-6269/ ISSN (printed): 2615-4021 .

marketing are unskilled and less educated. De and Das (2010) have the opinion that though *Muga* silk production in Assam has increased, but *Muga* silk production of Assam to the total raw silk production has recorded drastically. Saikia (2012) lays emphasis on the demand of Muga silk. The author states that the demand of Muga silk has increased both in the domestic as well as in the international market. Baishya (2005) states that the demand for silk yarn rises on the eve of *Durga Puja* and in marriage seasons.

Gujrati (2007) states that in almost all the socio-economic and business research the explanatory variables of a regression model are the mixture of quantitative and the qualitative variables. In his study, the author develop a regression model such that –

$$Y_i = \beta_1 + \beta_2 D_{2i} + \beta_3 D_{3i} + \beta_4 x_i + u_i$$

Madnani (2004) states that the regression model, which is a mixture of attribute and the qualitative variables. The author explains that to achieve different information from a sample, it is required to develop a regression equation, such that –

$$C_j = \beta_0 + \beta_1 Y_1 + \beta_2 D_{1j} + \beta_3 D_{2j} + \beta_4 D_{3j} + u_j$$

$C_j$is the dependent variable, Y_1 is the quantitative explanatory variable and D_{1j}, D_{2j}, D_{3j} are the dummy explanatory variables, where –

$$D_{ij} = \begin{cases} 1, \text{if the observation belongs to a specific category.} \\ 0, \text{if the observation belongs to any other category.} \end{cases}$$

i= 1, 2 and 3

4. Objective of the studies

This paper is structured to accomplish the objectives –

1. To describe the Descriptive Statistics for the Dummy Data
2. To identify the seasonal impact on the demand of finished products.

5. Hypothesis

The related hypothesis of this study are-

H_0: There is no significant effect of seasonal swing on the demand of Silk Products at Sualkuchi silk industries.

H_1: Seasonal swing affects the demand of Silk Products at Sualkuchi silk industries.

6. Model Formulation

Most of the economic time series based on monthly or quarterly data exhibits seasonal pattern and it is required to remove the seasonal factor, or component, from a time series so that concentration can be made to the components. The process of removing the seasonal component from a time series is known as deseasonalization or seasonal adjustment, and the time series thus obtained is called the deseasonalized,or seasonally adjusted time series. Among the several methods dummy variable method is playing an important role to deseasonalized the time series data (Gujrati, 2007; Madnani, 2004; Maddala, 2010).

Considered that there are '*m*' seasons and the numbers of dummy variables are '*m*'. So, to fit a dummy regression model with intercept it is required to use '*m-1'* dummy variables. If Y_t be the dependent variable, the dummy regression model is –

E-mail address: info@researchparks.org
Peer review under responsibility of Emil Kaburuan.
ISSN (electronic): 2620-6269/ ISSN (printed): 2615-4021 .

$Y_t = \alpha_1 + \alpha_2 D_2 + \alpha_3 D_3 + \ldots + \alpha_m D_m + u_t$

whereD_i is the Dummy Variable for the i^{th}season, $i = 2, 3, 4 \ldots m$, and

$$D_i = \begin{cases} 1, Presence\ of\ the\ membership \\ 0, Absence\ of\ the\ membership \end{cases}$$

Here the intercept value α_1 represents the demand of reference season and the coefficients attached to the Dummy Variables are the differential intercept coefficients, *i.e*. the differences of the demand of reference season and the other seasons (Gujrati, 2007).

6.1. Data collection

To test the check the Seasonal impact on the demand of raw materials and finished products, a primary data is collected from Sualkuchi, from 16th to 27th December, 2023. Here the data is collected on the demand of the *Mulberry* silk yarns and the demand of *Makhela-chadar* (prepared from *Mulberry* silk yarn) from 2018 to 2023. Sualkuchi is a multicast town, situated on the North bank of the river Brahmaputra, about 35 kilometers away from Guwahati, which is known as the 'Manchester of Assam'. Having a long tradition of silk weaving at least since the 17th century, Sualkuchi is the prime centre of silk hand loom industry of Assam. Originally Sualkuchi is a craft village, having several cottage industries, viz.- oil pressing in the traditional *ghani*, gold smithy, pottery, handloom industry etc.But now, all most all the cottage industries except handloom industry are extinct gradually and the artisans have already taken up silk weaving as their profession.

6.2. Analysis of the seasonal impact on the demand of finished products

Saikia (2012), advocates that the demand of the silk products at Sualkuchi goes high during festival and marriage seasons. Talukder (2010), laid emphasis on the production of *Khasi* dresses at Sualkuchi and said that though there is a round year market, but the peak season of the silk textile of *Khasi* products starts in November and continuous upto June. Baishya (2003), reveals that the demand for silk products of Sualkuchi rises during *Durga Puja* and in marriage seasons.

In this study, considering the major target selling seasons of finished products, a year is divided into four business seasons (Baishya, 2003), namely-

Season 1: January to March

Season 2: April and May

Season 3: June to September

Season 4: October to December

If D_i is the dummy variable for the i^{th} season, $i = 1,2,3$ and 4 and first season is considered as the reference season, then to avoid the dummy variable trap no dummy variable will be considered for the first season and the model is –

$Y_t = \alpha_1 + \alpha_2 D_2 + \alpha_3 D_3 + \alpha_4 D_4 + U_t$, ... 6.2.1

Where $D_i = 1$, for the i^{th} season and 0 otherwise.

Here the intercept α_1 represents the demand of finished products in first season and the coefficients attached to the dummy variables are the differential intercepts.

Based on the sample data, season wise demand of silk products of Sualkuchi silk industries for six years from 2018 to 2023 has been stated.

E-mail address: info@researchparks.org
Peer review under responsibility of Emil Kaburuan.
ISSN (electronic): 2620-6269/ ISSN (printed): 2615-4021 .

Season wise demand of silk products of Sualkuchi silk industries from 2018 to 2023

	Seasons	I	II	III	IV
Year					
2018		66178	19197	88024	29209
2019		63642	18802	85440	28162
2020		64739	19057	87461	28264
2021		62104	18624	83839	27472
2022		62709	18546	83944	27606
2023		65625	19154	87178	28174

From the collected data the dummy variable regression model to identify the seasonal impact on demand of finished products can be fitted as-

$$Y_t = 64166.167 - 45269.5D_2 + 21814.833D_3 - 36018.333D_4 \quad ...6.2.2$$

Therefore from the dummy regression equation (6.2.2), it is observed that the coefficients of the dummy variables D_2 and D_4 are negative, which implies that the average demand of finished products at Sualkuchi in second and fourth seasons are less than the average demand of season-1, by 45269.500 units and 36018.333 units respectively. On the other hand the average demand of the same product in third season is more than the average demand of the first season by 21814.833 units, as the coefficients of the dummy variables D_3 is positive.

Moreover the equation (6.2.2) explains that the *'p'* values of the demand of finished products of Salkuchi silk industries in all the seasons are less than 0.05. Therefore this leads the rejection of null hypothesis at 5 percent level of significance for all the seasons. Thus one can draw the conclusion that, at Sualkuchi, seasonal swing affects the fluctuation of the demand of finished products (*Mekhela-Chador*).

7. Conclusion

In this study a year is divided into four business seasons with respect to the demand of finished products. In the present study, demand of *Mekhela-Chador*, prepared from Mulberry silk yarns is considered. Now to fit the dummy regression model (equation (3.4.1)), first season is considered as bench mark. So no dummy variable is assigned against the first season to avoid the dummy variable trap. Here the coefficients of the dummy variables, i.e. differential intercept coefficients indicate the difference between the average values of the intercepts of the category those receive the value 1 to the intercept coefficient of the benchmark category.

From the available data, collected from the field survey it is found that with respect to the demand of *Mulberry* silk products (*Mekhela-Chador)* at Sualkuchi, a year is divided into four seasons, where, in two seasons (Season 1 and Season 3) demand of the silk products goes very high and in two seasons (Season 2 and Season 4) the demand of the products of the *Mulberry* silk yarns becomes very poor.

From the field survey, it has been seen that during peak seasons there is no problem, but the problems arise during the dry business seasons. During lean seasons the demand of silk products goes down and in such situations the weavers are push to sell their products in low price, perhaps lower than the existing market price. During lean seasons, sometimes the weavers sell their products less than the cost of production, which is known as distress selling, due to which poor weavers remains poor.

To get rid of this distress selling situations, the independently working weavers come into an agreement with the brokers. According to this agreement, the brokers will furnish all the necessary raw materials

E-mail address: info@researchparks.org
Peer review under responsibility of Emil Kaburuan.
ISSN (electronic): 2620-6269/ ISSN (printed): 2615-4021 .

to the weavers. The weavers will prepare the product and will return the products to the brokers and the brokers will pay the wage to the weavers. Though in such agreement weavers need not to worry about the marketing of their product, but always they have to depend on the brokers. Of course now a days the weavers co-operative societies have come forwards and register the weavers to save them and their arts.

Bibliography

Book

1. Cohen, J. *et al*. (2003). *Applied multiple regression/correlation for the behavioral Sciences*. Hillsdale: NJ: Lawrence Erlbaum Associates.
2. Greene, W. H. (2008). *Econometric Analysis.* New York: Pearson Prentic Hall.
3. Gujrati.(2007). *Basic Econometrics*. New Delhi: Tata McGrow-Hill.
4. Koutsoyiannis, A. (2004). *Theory of Econometrics*. New York: Palgrave.
5. Maddala, G. S. (2010). *Introduction to Econometrics*. New Delhi: Wiley India (P) Ltd.
6. Madnani, G. M. (2004). *Introduction to Econometrics*. New Delhi: IBH Publishing Co. Pvt. Limited.
7. Myers, J. L. and Well, A.D. (2003).*Research design and statistical analysis (2nd ed).* Mahwah: NJ: Lawrence Erlbaum Associates.
8. Raina, R. S and Das, K. (2020).*Inclusive Innovation: Evidence and Options in Rural India*. New Delhi, India: Springer.

Journal Articles

9. Abdul, I and Murata, A. (2011).A fast-response production-inventory model for deteriorating seasonal products with learning in set-ups.*International Journal of Industrial Engineering Computations* , 715-736.
10. Aktar, N. (2019). Livelihood Vulnerability and Coping Mechanism Among the Silk Weavers of Sualkuchi, Assam. *International Journal of Social Science and Economic Research*, 2959-2972.
11. Baishya, P. (2003). The Silk industry of Assam: A Case study in the Sualkuchi Cluster. Guwahati: *Institute of Advanced Study in Science and Technology*.
12. Gonzalez, J. L., Gonzalez, D. (2010). Analysis of an Economic Order Quantity and Reorder Point Inventory Analysis of an Economic Order Quantity and Reorder Point Inventory.*A senior project submitting in partial fulfillment of the requirements for the degree of Bachelors of Science in Industrial Engineering*. California, USA: California Polytechnic State University.
13. Saikia, J. N. (2011). Supply Chain Linkages and Constrains in Natural Silk Sector of Assam: A Study of Muga and Eri Silk. *International Journal of Multidisciplinary Management Studies, Vol. 1(3)*, 176-194.
14. Talukder, R. B. (2010, January 30). Retrieved August 23, 2014, from http:// southasia.oneworld.net/features/silk-for-all-seasons#.U eFu8VdXQM.
15. Venkataramana, M. et al. (2016). Regression Analysis with Categorical Variables. International Journal of Statistics and Systems, Volume 11(2), 135-143.

E-mail address: info@researchparks.org
Peer review under responsibility of Emil Kaburuan.