Vol. 4 No. 3 June 2016 ISSN: 2319-961X

# AN ANALYSIS OF THE VALIDITY OF KINKED DEMAND CURVE ON GRANITE INDUSTRIES AT CHENNAI

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**Abstract**

*The world we have described is clearly different from the world implied Oligopoly. A large number of small firms that produce a homogeneous product characterize a perfectly competitive market. As a result, each firm is a price taker and in the long run economic profit it equal to zero. This cannot happen in reality. Therefore, we come across the situation of less than pure competition or imperfect competition. Among these various types of such imperfect competitive markets, some types are very common in the practical world namely, monopoly, monopolistic competition and oligopoly competitive markets. These markets are representing the actual market situation. Therefore the conclusion which are followed from the theories of imperfect competition particularly the above three market a are found to be applicable to the real world.*

***Keywords**: oligopolist, Cournot model, Tobit model, Herfindahl Index, Granites industry, retail markets*

## Introduction

It is pretty well agreed among economist that the ordinary concept of a demand curve is inapplicable to the study of oligopoly. Because in oligopoly some special characteristics are found which are not present in other market forms such as interdependence in decision-marking, importance of advertising and selling costs, group behavior among the oligopolies and indeterminateness of demand curve facing an oligopolist. Therefore economists have suggested various models which are based upon behavioral assumption about individual firm to determine equilibrium in the oligopolist market, but in reality it has been observed that may oligopolistic industries exhibit an appreciable degree of price rigidity or stability on the basis of this observation. We have a model suggested by Paul Sweezy to determine the equilibrium under oligopolistic market which is popularly known as the hypothesis,' the demand curve facing an oligopolist has a 'kink' at the level of prevailing price. The kink is formed at the prevailing price level because the segment of the demand curve above the prevailing price level is highly elastic and the segment curve below the prevailing price is less elastic.

Therefore this model suggests the market situations are one in which rivals will quickly match price reductions but hesitantly and incompletely follow price increases. This behavior of the oligopolies was tested by Prof. George J. Stigler and he suggests that there does not exist any kink in the demand curve confronting oligopolists. At the same time his study does not question the price rigidity under oligopoly. From this it can be understood that still there is a pitfall in the validity of the theory in the determination of equilibrium

of an oligopoly firm. Therefore the paper is decided to consider this pitfall as its research theme. Thus this study will try to curve the pitfall prevailing in an oligoplistic market.

**Review of Earlier Studies**

**W. Bentley Macleod, (1985)** he studied the 'rationality' of conscious parallelism within the context of a dynamic oligopoly model. The doctrine of conscious parallelism is modeled as the outcome of a signaling game in which the rules of response are specified axiomatically. This will result in a unique solution to the oligopoly problem that is based on firms need to have consistent expectations that subsequently generate collusive behavior. This model can then be used to more precisely define the conditions that facilitate or limit oligopolistic coordination, as found in the traditional industrial organization literature.

**Kwang Soo Cheong and Kenneth L Judd, (1997)** static oligopoly theories disagree on whether mergers are profitable. The Cournot model says that many potential mergers would be unprofitable whereas the Bertrand model says that all mergers are profitable. We shows that, for economically sensible parameter values, mergers are profitable for merging firms when firms choose both price and output, using inventories to absorb differences between output and sales. Furthermore, substantial cost advantages are necessary for a merger to benefit consumers. The merger predictions of our dynamic model are most similar predictions of static Bertrand analyses of differentiated products even though our model often behaves like the Cournot model in the long run.

**Minten, Bart and Kyle, Steven, (2000)** some African food markets can still seem to operate inefficiently after price liberalization. This seems mainly due to the existence of significant transaction costs because of small - scale operations, and influenced by lack of grading, deficient infrastructure and information systems. It is shown in case of retail markets in kinshasa that search, supervision and other difficult-to-measure transactions costs are more important in the margin of food products than the measurable marketing costs(e.g., storage, transport). It is also shown through time series analysis the most of the price transmission between wholesale and retail happens in the same week and that price asymmetry ie., the different transmission of price increase compered with price decreases is present for most products. Products characterized by relatively more standardization and homogeneity are shown to have lower retail margins and behave symmetrically. A model based on kinked demand curves and search costs might explain this asymmetric price behavior.

**Federico Etro, (2006)** This article provides an overview of recent progress in the theory of market structure of the role of market leaders and the scope of industrial policy, presents new results through simple examples of quantity competition and competition for the market develops new applications to the theory of competition in presence of network externalities and learning by doing, of strategic debt financing in t he optimal financial structure, of bundling as a device, of vertical restraints through inter brand competition, of price discrimination and to the theory of innovation.

**Ash Morgan, (2008)** Several laboratory experiments and market-based research in the fields of psychology, economics and marketing have provided increasing evidence of individuals exhibiting loss aversion tendencies, with decision-making based on a pre-existing reference point. This creates an S-shaped value function and associated kink in the demand curve. This research provides contingent behavior analysis of 1790 seafood consumers across the Mid-Atlantic region. A survey is specifically designed to elicit respondents' change om consumption from their reference point when faced with price variations in the seafood market. Results from a Tobit model with random effects provide empirical support of consumers behaving in a manner consistent with loss aversion theory, revealing a kinked demand curve for seafood meals at the respondents' reference point.

**Objective and Methodology**

The main objective of this study is to reexamine the price rigidity in an oligopolistic market as suggested by the kinked demand -curve theory.

To examine the validity, this study requires the price details of the Chennai granite industries. This can be collected by asking them to provide it. This study required the price lists for the past five years (2008 to 2012).

It is impossible to analyze the price lists of all products that they produced. Similarly it is impossible to include all firms in the granite industry. Therefore the researcher selected by using the 'concentration' and the Herfindahl Index. To analyze the collected data, this study will use a statistical tool namely the “coefficient of variation” which, measures the amount of variation in the data groups with different means. After accomplishing these processes the interpretation and the reports will be written.

**Sample Procedure**

The concentration ration and the Herfindahl index were used for the selection of study forms. In the first stage Chennai Corporation was purposively selected, as its one of the major producers of granite in India, contributing 60 percent of production in Tamil Nadu and 39 percent of production in India. In the next stage, 25 products among 147 products were selected which are accounts for 91 percent of demand in all the firms. To identify the concentration ratio of each firm in the market, “The All India” Granite Association (south) (AIGA) was approached. To identify the Herfindahl index of each firm. The market share of each firm for the years of 2008, 2009, 2010, 2011, and 2012 were identified and it was summed and squared. That value is considered as the Herfindahl index. Data were collected during November by using personal interview.

From the above table the firms namely GEMS GRANITES, EURASIAN GRANITES, GALAXY SPECTRUM GRANITES, NATURAL STONES and EVTERPRISING ENTERPRISES, were selected on the basis of their concentration ratio and their Herfindahl index. Among the selected firms GEMS GRANITE(2043) has more concentration and also the HHI. Thus it is

considered as the 'price-leader' of the Chennai Granite industry. For the simplicity, this study gave name like X1, X2, X3, X4 and X5 to each firm on the basis of their name.

X1 = GEMS GRANITES (2043) THE LEADING FIRMS
X2 = EURASIAN GRANITES (2067)
X3 = GALAXY SPECTRUM GRANITES (2251)
X4 = NATURAL STONES (3333)
X5 = ENTERPRSING ENTERPRISES (3996)
X2, X3, X4 and X5 are the followers.

The 25 common sample products out of 147 were selected on the basis of the suggestion given by each firm which is accountant for 91 percent demand in all forms.

**Table 1: On 20mm Products between the Leading Firm X1 and Follower Firm X2, X3, X4, X5**

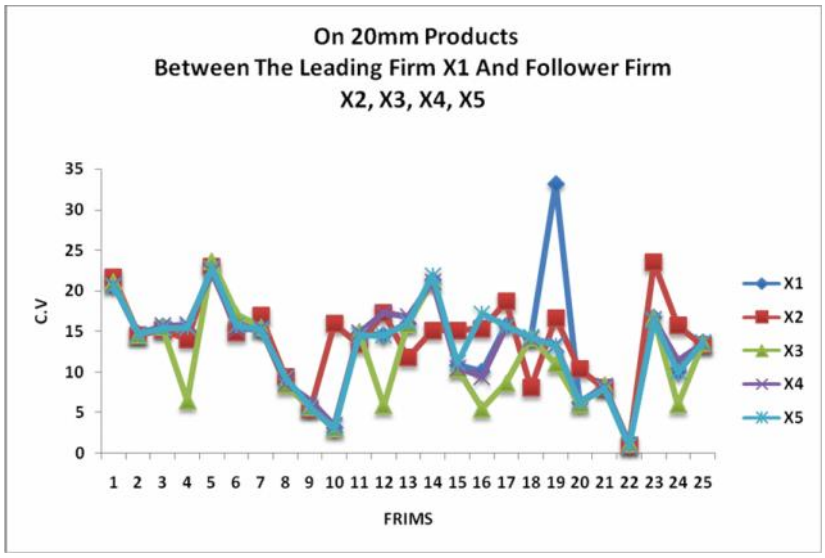
| Sl. No | Product Name | Coefficient of Variations | | | | |
|---|---|---|---|---|---|---|
| | | X1 | X2 | X3 | X4 | X5 |
| 1 | BLACKGALAXY | 20.7240141 | 21.6759435 | 21.11247 | 20.77008 | 20.61234 |
| 2 | JET BLACK | 14.7650539 | 14.59298178 | 14.56976296 | 14.6398911 | 14.67675 |
| 3 | ABSOLUTE BLACK | 15.5990721 | 15.22023714 | 15.4786692 | 15.71188558 | 15.4108 |
| 4 | PLATINUM BLACK | 15.0949034 | 14.03061448 | 6.467859452 | 15.80826943 | 15.49556 |
| 5 | KASHMIR WHITE | 22.7867301 | 22.9452489 | 23.63936713 | 22.30530855 | 22.79589 |
| 6 | PARADISO | 15.4923482 | 14.85026699 | 17.063461123 | 15.24935538 | 15.70506 |
| 7 | KASHMIR GOLD | 15.1228763 | 16.90946712 | 15.5261615 | 15.53536351 | 15.24865 |
| 8 | SHIVA YELLOW | 9.02813847 | 9.410823196 | 8.400332797 | 8.671911929 | 9.306504 |
| 9 | SHIVA GOLD | 5.66706136 | 5.485379929 | 5.67465763 | 6.460789445 | 5.666028 |
| 10 | TAN BROWN | 3.17942404 | 15.955004707 | 3.057453513 | 3.430798168 | 3.131212 |
| 11 | SHPHIRE BROWN | 14.7430258 | 13.4730697 | 14.94692334 | 14.8752774 | 14.53969 |
| 12 | BLACK PEARL | 14.5236526 | 17.27624628 | 5.908119213 | 17.32938004 | 14.52983 |
| 13 | LEVENDER BLUE | 16.0168122 | 11.83373332 | 15.91101324 | 16.84589903 | 16.04968 |
| 14 | VIZAG BLUE | 21.3086086 | 15.13973696 | 21.12183048 | 21.1600609 | 21.93897 |
| 15 | KUPPAM GREEN | 10.7829921 | 15.13119705 | 10.40072397 | 10.5178321 | 11.10847 |
| 16 | HASSAN GREEN | 10.071683 | 15.34609307 | 5.485808262 | 9.423893098 | 17.18023 |
| 17 | COLOMBO JUPERANA | 15.8042264 | 18.72018596 | 8.654537933 | 15.60470816 | 15.67347 |
| 18 | INDIAN JUPERANA | 14.1108127 | 8.070092394 | 14.21733842 | 14.13557334 | 14.31407 |
| 19 | RED MULTICOLOR | 33.2017705 | 16.6721657 | 10.9923404 | 13.41950982 | 13.18486 |
| 20 | RAW SILK(PINK) | 6.26964105 | 10.34001045 | 5.949400488 | 6.27996964 | 6.335133 |
| 21 | RAW SILK (IVORY) | 8.12020556 | 8.06504817 | 8.3947822961 | 8.274196254 | 7.954263 |
| 22 | DARK GREEN | 1.07615533 | 0.96140904 | 1.1762655404 | 1.116656666 | 0.944402 |
| 23 | IMPERRIAL RED | 16.7545715 | 23.48270612 | 16.61871286 | 16.51721366 | 16.39446 |
| 24 | TIGER SKIN | 10.0486433 | 15.7515761 | 6.027615392 | 11.401110363 | 10.02485 |
| 25 | HIMALAYN BLUE | 13.6929357 | 13.31182271 | 13.54171163 | 13.50895372 | 13.64902 |

Source: Calculated by the Researcher

In making analysis on the overall price movements between the leader firm and the followers. We must consider the assumption existing under the kinked - demand model. That is "each oligopolistic believes that if he lowers the price below the existing level his competitors will follow him and will accordingly lower their prices, whereas if he raises the price above the prevailing level his increase in price. If we see the above given, diagram we can understand three aspects. There are;

- When the leader firm reduces his price the follower firms are following this reduction and they lower the price.
- On the hand the followers are following the price increase made by the leader fir. This should be considered.
- There are some vast variations the followers. It is because of the price differences between the followers and leader, which mainly emerges due to the differences in the cost of production. Here the variations are very few. Hence, it does not bring the problem.

Here it must be considered that, when leading firm increases its price, the followers also increase their price which is oppose to the rule of kinked-demand model. This can be because of the rise in cost of production, imposition of sales tax and etc. which are affects all firms equally. It is because of this reason only all the regardless of leader and follower are increasing their prices. From the above analysis, it is clear that the assumption hold by the kinked- demand model called stick or rigid price is true in this industry (on 20mm products)




**Major Findings of this Study**

- With the five major producers in the granite market, the dominant firms GERMS GRANITE (X1) fixes the monopoly price to some extends. Because GERMS GRANITE is

the major supplier in the market.

- In the granite industries at Chennai, there is a price leadership firm holding price determination power through large market share and low costs of production.
- The degree of price rigidity observed for a product varies symmetrically with the quantity response to a price change likely to be exhibited by followers firms with greater rigidity associated with less responsiveness.
- Price rigidity is asymmetric in the sense that greater rigidity is observed for upward movements in products prices than for downward changes.
- It is observed that the symmetry appears to be greater for cases in which followers are likely to exhibit less of a quantity response to a change in product rates.
- Chennai granites industry in an asymmetric oligopoly because the firms are not of equal size.
- The observations of price changes in Chennai granite industry are not changing with the regularity predicted by economic theory.
- There is no proper revenue function for these industries. Because the amount they sell depend on the prices charged by the other competitors and the price leader.
- When the trade is good, the followers feels that no need to expand sales by cutting prices instead they take higher profits by collectively raising price.
- No firms are following the exact prices implied by the leading firm. All are having the near prices.

**Conclusion**

This study has proved statistically, that the price rigidity and the price leadership are existing in granite industries Chennai. With the light of this facts, it can be observed that the granite industries in Chennai. There is a cutthroat competitions on going on which bring price war among them. It simply denotes that they are merely cutting each other's throats for their survival. One of the important results that this kink theory can be applicable only in the depressed market. At the same time this study also found that the followers match the price increases also with the leader. Therefore, regarding the market situation we come to know that the granite market is in good and healthy condition. Otherwise the followers cannot match their prices with the leader.

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