External analysis of strategic market management can be realized based upon different human mindset – A debate in the light of statistical perspective

Prasun Chakrabarti
Head, Department of Computer Science and Engineering
Sir Padampat Singhania University
Udaipur-313601,Rajasthan, India
prasun9999@rediffmail.com

Prasant Kumar Sahoo
The Vice-Chancellor
Utkal University
Bhubaneswar - 751004,Orissa
prasantsahoo12@yahoo.co.in

***Abstract* - The paper entails the statistical correlation of the investigations carried out for the sales and profit prediction and analysis by persons of different mindsets in case of strategic uncertainty . The paper by virtue of statistical and fuzzy logic based justifications has pointed out certain discovered facts in this perspective. The normal , optimistic , pessimistic and fickle-minded based individual mindsets significantly contribute to varying external analysis of business statistics.**

***Keywords* -** *statistical correlation , fuzzy logic , optimistic , pessimistic , fickle-minded , business statistics*

I. INTRODUCTION

Strategic development or review[1] deals with an analysis of the factors external to a business that affect strategy. In strategic market management, estimation of sales and profit plays a significant role . Sometimes a separate statistical analyst team is solely recruited in certain business companies. A running business can be investigated on the basis of apriori events and statistical trend analysis[2,3]. However in certain cases due to some external stochastic events, statistical analysis has to be carried out based upon prediction and forecasting and in this perspective of strategic uncertainty , the business estimate varies from individual to individual depending on his nature viz. normal , optimistic , pessimistic and fickle-minded.

II. VARIATION OF EXTERNAL ANALYSIS OF STRATEGIC MARKET MANAGEMENT BASED ON HUMAN MINDSET

Certain discovered facts can be pointed out pertaining to the variation of external analysis of strategic market management depending on the human nature. We propose certain mathematically established axioms in this context. An opportunity or a threat results in a significant change in pattern of the sales and profit of a business. Marketing Myopia[4] also indicates the essence of investigation of sales and profit in case of strategic uncertainty. Furthermore, profit and loss are two mutually exclusive events at any specific timing instant of the observation period. Therefore, R , the Bernoulli random variable[5] for the external analysis of business strategy in this situation , can be viewed as –

R = 1 if profit occurs
else = 0 if loss occurs.

R is a statistical indicator of X or Y.

Claim 1 - If prediction of occurrence of gain in a strategic market management by a normal individual is based upon estimation of weight of single associated parameter and hypothesis of fairness by pessimistic individual is rejected , then for unit negative bias, the estimate of weight of the single parameter by either historical or predictive means by a normal person is represented as a complex variable.

Illustration of Claim 1 –

In case of business uncertainty, predictive decisions among various business analysts differ considerably. A normal person will efficiently judge the current status of the business and try to predict in a concise manner.

In many cases it can be observed that optimistic , pessimistic and fickle minded persons predict the sales and profit status defying the current status and hence the statistical hypothesis as per their predictions are likely to be biased.

In this claim, we propose the correlation of estimation of normal person with a pessimistic individual.
The proposed mathematical equation of neuro-fuzzy based

event (gain) estimation between a pessimistic and a normal individual in case of strategic uncertainty is as follows-

$$Tp + \beta = AWn = [(\sum_{i=1}^{x} AW_{x,i} * AW_{y,i}) / x] \quad \text{……..(1)}$$

where Tp = average accuracy estimation of gain by pessimistic individual,

β = unit negative bias value

AWn = effective weight of the associated parameters per prediction by a normal individual

$AW_{x,i}$ = estimate of weight of i^{th} parameter on the basis of sampled historical information ,

$AW_{y,i}$ = estimate of weight of i^{th} parameter on the basis of present hypothesis,

x = total number of instances of the arrival of the event gain

As per our proposal , single incidence of gain takes place and hypothesis of fairness by pessimistic individual is rejected .

Therefore, $AW_{x,1} * AW_{y,1} = 0 + \beta$ or, $(AW_{y,1})^2 = \beta$

or, $(AW_{y,1})^2 = -1$ [since unit negative bias]

or, $AW_{y,1} = (-1)^{1/2}$ ……..…….(2)

Similarly, we can show that $AW_{x,1} = (-1)^{1/2}$ ……....(3)

Hence it is justified to state that "If prediction of occurrence of gain by a normal individual is based upon estimate of weight of single parameter and hypothesis of fairness by pessimistic individual is rejected , then for unit negative bias, the estimate of weight of the single parameter by either historical or predictive means by a normal person is represented as a complex variable".

Claim 2 - Accuracy estimate of future prediction of occurrence of an uncertain event (gain or loss) is governed by the principle of hypothesis of fairness rule in case of both optimistic and pessimistic individuals.

Illustration of Claim 2 –

Strategic uncertainties focus on specific unknown parameters that will affect the outcome of strategic decisions. In this claim we have proposed that the principle of hypothesis rule plays a pivotal role in strategic decisions. A statistical hypothesis[6] is an assertion about the distribution of one or more random variables which we want to verify on the basis of a sample.

In this claim we represent mathematically the relation among predictive gain estimates done by normal , optimistic and pessimistic individuals.

$$P (| \beta o - \alpha n | \geq \mu) = P (| \alpha n - \beta p | \geq \mu) = V \quad \text{……(4)}$$

where βo = predicted value of percentage of gain by optimistic person in higher crisp form

αn = predicted value percentage of gain by normal person being 0.5

βp = predicted value percentage of gain by pessimistic person in higher crisp form

μ = estimate of deviation of both optimistic and pessimistic from actual outcome V ; $V \in \{ 0,1 \}$.

If V = 1, $P (| 1 - 0.5 | \geq (1-1))$ is valid and it reveals that prediction of optimistic individual is accurate and we reject hypothesis of fairness of pessimistic individual as $P (| 0.5 - 0 | \geq (1-0))$ is absurd.

Similarly, if V = 0, $P (| 1 - 0.5 | \geq (1-0))$ is absurd and it reveals that hypothesis of fairness of optimistic individual is rejected.

Hence it is justified to state that "Accuracy estimate of future prediction of occurrence of an uncertain event (gain or loss) is governed by the principle of hypothesis of fairness rule in case of both optimistic and pessimistic individuals".

Claim 3 - In case of sales and profit estimation of strategic market management done by a fickle-minded person , the predicted value (Tv) clearly acts as a reference parameter for identifying the output (To) trends towards both rare and frequent fuzzy domains.

Illustration of Claim 3 –

Fuzzy set theory was proposed in 1965 by Lotfi A. Zadeh. A fuzzy set[7] can be defined mathematically by assigning to each possible individual in the universe of discourse, a value representing its grade of membership in the fuzzy set.

In definite form , crisp value is coined and it is in bivalent or binary variable state {0,1}, while the fuzzy value is in probabilistic form and lower and higher crisps indicate the lower and upper boundary limits of a fuzzy range. The average (0.5) is a threshold that indicates rare range ($0 \leq L_R \leq 0.5$) and frequent range ($0.5 \leq F_R \leq 1$).

The following table illustrates that in case of the sales and profit estimation of strategic market management done by a fickle-minded person, the predicted value (Tv) clearly acts as a reference parameter for identifying the output (To) trends towards both rare fuzzy (L_R) and frequent fuzzy domains (F_R). C_L and C_H represent lower and higher crisp values respectively.

Nature	If (Tv < To)	If (Tv > To)
Optimistic	Tv = { F_R }	(i) Tv = { F_R , C_H

	To = { C_H }	} To = { C_L , L_R , A_{VG} } (ii) Tv = { C_H } To = { C_L , L_R , A_{VG} , F_R }
Pessimistic	(i) Tv = { C_L , F_R } To = { A_{VG} , F_R , C_H } (ii) Tv = { C_L } To = { L_R , A_{VG} , F_R , C_H }	Tv = { L_R } To = { C_L }
Fickle-minded	Tv = { A_{VG} } ***To = { F_R , C_H }***	Tv = { A_{VG} } ***To = { C_L L_R , }***

Table 1 : Gain estimation depending on different human mindset and

Hence it is justified to state that "In case of sales and profit estimation of strategic market management done by a fickle-minded person , the predicted value (Tv) clearly acts as a reference parameter for identifying the output (To) trends towards both rare and frequent fuzzy domains".

Claim 4 - The null hypothesis of validity of an unknown event (gain or loss) for a biased individual is identical to alternate hypothesis of the same for a normal person.

Illustration of Claim 4 –

In this claim we have proposed that in case of strategic uncertainty, the general statistical rules of null and alternated hypothesis can be significantly correlated with the external analysis of strategic market management in the view of a biased (either optimistic or pessimistic) and normal person.
Let p be unknown binary state of validity of an event (gain or loss) in case of biased individual
and q_s is specific fuzzy estimate.

Therefore, H_0 **:** $p = q_s$ ……....(5)

and H_A **:** $p \neq q_s$…….(6)

where H_0 and H_A are null and alternate hypothesis respectively of biased person. In this context biased person indicates optimistic and pessimistic nature of a person.

Now, (1-p) is unknown binary state of validity of an event (gain or loss) in case of normal person and q_n be specific fuzzy estimate.

Since the event is valid, hence $q_s = q_n = 1$.

Hence, H_0 **:** $(1-p) = q_n$ ……..…..(7)

and H_A **:** $(1-p) \neq q_n$…….……..…(8)

where H_0 and H_A are null and alternate hypothesis respectively of normal person.

Biased property reflects false belief which means Eq(5) is invalid. In that case the validity of Eq(6) concludes that $p \neq q_s$ .Now q_s has to be in higher crisp whereby p = 0.

Let us examine whether Eq(7) is valid under this circumstance.

For Eq(7) to be valid , $(1-p) = q_n = 1$. Now q_n has to be 1 whereby p = 0. It indicates that alternate hypothesis of schizophrenic patient is identical to the null hypothesis of normal person, and vice-versa.

Hence it is justified to state that "The null hypothesis of validity of an unknown event (gain or loss) for a biased individual is identical to alternate hypothesis of the same for a normal person."

III. CONCLUSION

The paper points out the following discovered facts –

1. If prediction of occurrence of gain in a strategic market management by a normal individual is based upon estimation of weight of single associated parameter and hypothesis of fairness by pessimistic individual is rejected , then for unit negative bias, the estimate of weight of the single parameter by either historical or predictive means by a normal person is represented as a complex variable.

2. Accuracy estimate of future prediction of occurrence of an uncertain event (gain or loss) is governed by the principle of hypothesis of fairness rule in case of both optimistic and pessimistic individuals.

3. In case of sales and profit estimation of strategic market management done by a fickle-minded person , the predicted value (Tv) clearly acts as a reference parameter for identifying the output (To) trends towards both rare and frequent fuzzy domains.

4. The null hypothesis of validity of an unknown event (gain or loss) for a biased individual is identical to alternate hypothesis of the same for a normal person.

REFERENCES

[1] Aaker, D. A. (2005). *Strategic Market Management.* John Wiley & Sons ,Inc.

[2] Cobb ,Charles W.,and Paul H.Douglas , "A Theory of Production", *Amer. Econ. Rev., Supplement* ,pp.139-165, 1925

[3] Samuelson , Paul A. , *Economics* , (10th edition),chap.20.,New York : McGraw-Hill Book Company,1976

[4] Levitt, T. (1960) "Marketing Myopia" *Harvard Business Review.* July-August ,pp. 45-56

[5] Olofsson, P. (2005). *Probability, Statistics, and StochasticProcesses.* John Wiley & Sons ,Inc.

[6] Giri, P. K. & Banerjee, J. (1999). *Introduction to Statistics.* Academic Publishers

[7] Zadeh , L.A. (1965), *Fuzzy Sets , Information and Control,* Vol.8, pp. 338-353

About Authors :

Dr. Prasun Chakrabarti is currently serving as Associate Professor and Head of the Department of Computer Science and Engineering of Sir Padampat Singhania University, Udaipur. He obtained Ph.D(Engg) degree from Jadavpur University in 2009, M.E. in Computer Science and Engineering in 2005 and B.Tech in Computer Engineering in 2003. He has about 101 papers in reputed national and international journals and conferences as well as 9 filed Indian patents in his credit . He has several visiting assignments at BHU Varanasi , IIT Indore et al. He visited Graduate School of IPS, Waseda University, Fukuoka, Japan Honorary Visiting Professor in May 2012 under INSA-CICS Travel Fellowship. He has been invited as Honorary Visiting Professor by Dr.H.Guo Associate Professor ,College of Management and Economics, China University of Geosciences, Wuhan China for delivering expert lectures on Application of Artificial Intelligence in Industrial Informatics in May 2014.

Prof. Prasant Kumar Sahoo, M.Com., FDPM, Ph.D. is educated at Utkal University and the Indian Institute of Management, Ahmedabad. Before joining as Professor of Management in Utkal University in 1991, he was also a Professor of Management in Berhampur University from 1987 to 1991 and was a faculty member of the P.G. Department of Commerce, Utkal University from 1976 to 1987. He was the Head of the Department of Business Administration in Utkal University from 1995 to 1997 and from 1990 to 19991 in Berhampur University. He was the Programme Director of MBA (Executive) Programme of Utkal University for two years (1995-1997). He has a large number of research papers published in various journals to his credit and is the author of four text-books. In addition, thirty two scholars have successfully completed their doctoral research under his supervision in the areas of Accounting and Finance.Three scholars working under his guidance have earned D.Litt. Prof. P.K. Sahoo is a core member of the AICTE expert Committee, a member of Editorial Board of Bima Quest, Journal of National Insurance Academy, Pune and was the Managing Editor of Sankalpa Journal for Management Development and Application for two years. He was also the Director, Directorate of Distance and Continuing Education, Utkal University in addition to his normal duties in the Department. Prof. Sahoo was also Head of the Department of Business Administration, Utkal University and the Warden of P.G. Hostels in the same University in 2006-2007. He was the Coordinator of the 5 Year Integrated MBA Programme, Chairman, P.G. Council and a member of the Syndicate of Utkal University. At present, Prof. Sahoo is the Vice-Chancellor, Utkal University. His current research interest is the investigation of the practical application and utility of Accounting and Finance theories in the Indian context.