TOWARDS A COMPOSITE COST FUNCTION FOR AN ENTREPRENEUR NOT SO RATIONAL: AN INSTITUTIONAL APPROACH TO COST FUNCTION OF SMALL AND TINY INDUSTRY OF VARANASI REGION

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Abstract

The axiomatic approaches towards cost relationship rely on the Homoeconomicus brand entrepreneur that performs in a free and frictionless world (in absence of institution). Successive developments differ in terms of objective of the individual assuming absolute rationality (may be of different magnitude or bounded one) and dealt with one or the other. The present approach differs *ab initio* to rely on personal construct and emanating different action tendencies there from. It proposes that final action is a weighted combination of different action tendencies and therefore in determining shape of a cost curve the relative weight assign to different action tendencies and the institution play important role. The endeavor verifies the proposition empirically employing cross sectional data from small and tiny industries. Using a production function extended by relative permittivity of institution and deriving a composite cost function, the finding suggests that due to institution curve takes a particular form.

Key Words: Institution, Rationality, Relative Permittivity, Composite Cost Function.

Topic Groups: Entrepreneurship, Economics and business

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INTRODUCTION

Economists acceded to the basic definition of individual entrepreneur[2] as he is rational. The main goal of so defined 'Homoeconomicus' is to earn profit and to pursue self interest. The studies attempt to delimit the entrepreneurial behavior in one contour and by granting '*ceteris paribus*' the real self of human existence is lost in artificial axioms. Optimization of the objective function is one such assumption that underpinned the life as collection of discrete objects rather than to be a process. The Successive developments such as managerial theory, behavioral theory, and transaction cost theory that tried to capture diverse goal of the firm, for example, sales maximization, productivity maximization etc. are the partial expression of a complete picture. Nevertheless, they provide a starting point to begin with. The axiomatic approach assumes that the homoeconomicus performs in a free and frictionless world i.e., he does not derive from the society he lives in, or he is free from social restrains and regulations, laws, and also the psychological impulses to move and to perform in a particular situation. Precisely, if we club these dimensions of psychological construct, the formal regulations (Law of the land) and informal regulations (unwritten law of the land such as, social customs, taboos, religious, faith, etc.) in one word- The Institution- the axiomatic or traditional approach does not incorporate '**the institution**' in any direct manner.

We begin with the faith that individual is a complex construct of different psychological impulses. Every single impulse has defined action tendency. A genuine combination of all impulses is the resultant action of the individual. Also, the individual performs in a medium defined by written and unwritten laws, so to say, and not in a vacuum. This way the institution comes into the theory by three corners; one, the individual construct, two, the written laws, and three, the unwritten laws. The medium permits the individual to perform as it causes frictions or it facilitates.

The study differs *ab* initio as it avoids excess of scientific methods i.e. to begin with clearly mentioned axioms, assumptions, inferences and conclusions and that is empirically verified. It also differs to assume an artificially imposed 'Absolute Rationality'; rather it relies on the Psychological construct of the individual entrepreneur where by different whims enables him to produce contradictory or complimentary action tendencies. The final or the actual action is the combination of all such action tendencies having weights of ranks annexed with it. The ranks may be a cognitive or emotive judgment or both. Obviously, this is denial of practice of positivism. This also adds the dimension of different perspectives of individual specificity and the social perspective given by the law of land, social customs and taboos. Therefore, the endeavor does not intend to find 'Meta – truth' that is independent of specific perspective. This way we may expect greater predictability of the cost curve.

The present endeavor is to find the role of institution on cost function of small and tiny industries. It has been divided in to five sections; Section I provides the theoretical development in the area of cost function; Section II and section III discuses the model and methodology respectively; the empirical findings are given in Section IV, finally conclusions of the effort is given in the section V.

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[2] By putting individual before entrepreneur we try to symbolize that entrepreneur is not an abstract existence, rather he is an individual in the ownership of the business who possesses characteristic of enterprise together with other individual characteristics.

I

Individual is basically defined on the basis of rationality & self interest and accordingly, the optimization of objective function is the derived action tendency. This portrayal is arranged via classical economists. They define individual as Homo Economicus. However, in the real world Homo Economicus brand individual does not exist. Subsequently, some theories have come into being with the flexibility in the individual characteristics such as given by Managerial, Behavioral, and the Transaction costs (TC) approach. They explain the objective of the entrepreneur on their own inference on behalf of individual. They differ in terms of one axiom or the other. Managerial theory works for the utility function of the managers (it differentiates the ownership from the management) and hence managers do not try to maximize the profit of the firm. They would give priority to their own objective function perhaps that could be the consolidation of power position in the firm (Williamson, 1963; Baumol, 1968). Their goal may be sales maximization, growth maximization, and so on. The pedestal for this diversification in theories is same as that of classical.

Behavioral theory is based on the bounded rationality and satisfaction of behavior rather than maximization (Dew, Nicholas, et. al., 2008; Cyert and March, 1963). Much of this depended on concerning behavior in situations of uncertainty, which argued that "people posses limited cognitive ability and so can exercise only 'bounded rationality' when making decisions in complex uncertain situations". Thus individuals and groups tend to 'satieties' - that is, to attempt to attain realistic goals rather than maximize a utility or profit function. There is a basic similarity amidst all these approaches i.e., they axiomize the rationality as absolute existence- be it smaller (the bounded rationality axiom) or greater in magnitude (the absolute rationality axiom). In itself, this method is useful but these rely on partial view of a complete self.

TC came into existence with the claim that it provides new approach. Ronald Coase defines firm theoretically in relation to the market (Coase, 1937, 1960 Williamson, 1975, 1979). Accordingly, there are costs in carrying out transactions and these transactions costs differ depending on the nature of the transactions and on the way they are organized. The basic objective of the firm is to organize itself in such a way as to minimize these transaction costs. Institutionalists have attempted to find out the ways to reduce transaction cost e.g., Coase (1960, 1988), Williamson (1975), and North (1990). They have explained that entrepreneur wants to minimize the transaction cost. The transaction cost emanates due to the friction in the system are due to existence of the institution. This way the transaction cost adds to rows and/or column of an accounting process. Hence, transaction cost adds the number of variables in the accounting of cost. Therefore, despite the fact that TC approach came in to being with new institutional economics but it does not add to understanding of the nature of cost. We argue that a pure subjective measure should begin with the complete self of an individual.

II

Institution: The Individual

Individual is at the pivot and he is emotional, social, rational and much more. His decision is governed by all the dimensions of his nature. The other aspect of institution is a medium in which performance of agents and the relationships take place *vis -a –vis* the influence of medium on the personal construct. He has multiple self within and the multiplicities are often

at conflict with each other[3]. Emotion represents a social relationship but it is an individual mind that creates them. Emotions are representations of governed phenomena and must as such be taken. They are more fundamental in the organization of human behavior than cognitions. That, in effect people may be emoters before they are cognizers. The problem of combining emotions and cognitions is multifold. It is due to emotions that the combination will be indeterminate. The answer to the indeterminacy lies in value system of an individual (Mishra and Singh, 2003b). It is the combination of emotion and cognition, which ensures a value system. It is proposed that the complete self of the individual is represented by his 'value system' (Singh and Singh, 2010).

A value is not just a preference but is a preference, which is felt and/or is justified morally or by aesthetic judgment. Patterns of value orientation have been singled out as the most crucial culture elements. Culture has value stands-cognitive, appreciative, and moral. All normal people are metaphysician; all have some desire to locate themselves in a 'system', a 'universe', a 'process' (Mishra and Singh, 2003a). Value can be subjective or objective, good or bad. There is always difference between imagination and the real situation. The difference is defined as 'value dissonance'. It is believed that 'Value Dissonance' results when individual have preferences over actual possessions which conflict with superior values inculcated into them (Singh and Singh, 2003). Entrepreneur tries to minimize this gap. This is the value dissonance that motivates the individual to deviate from the one value of profit maximization. Different value dissonance cause different impulses.

We have proposed nine impulses of the individual entrepreneur and they are- profit, pride, productivity, market size, self satisfaction, high price, financial proficiency, production, and consumer satisfaction. Following the impulse, entrepreneurs have action tendencies. Impulse profit is being achieved through profit maximization and the impulses market size, self satisfaction and production are achieved through the action tendency, output maximization. Revenue maximization is being adopted to accomplish pride. However, revenue per unit cost and productivity maximization is the action tendencies resorted to by the entrepreneurs is governed by financial proficiency and pride, respectively. The impulse, high price is materialized through the action tendencies price maximization and profit per unit cost maximization. We have taken into consideration seven action tendencies, and hence we should have seven different equations representing equilibrium given each one of them. However, we have only three equations as the first order maximization condition for the action tendencies profit, output, revenue and revenue per unit cost is similar. Price and profit per unit cost maximization are given by condition of price maximization. The productivity maximization is given by itself (See Table 1).

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[3] Cases of Multiple Personality Disorder lends support to the prima face existence of multiple self.

Table 1: Impulse and their Action Tendencies
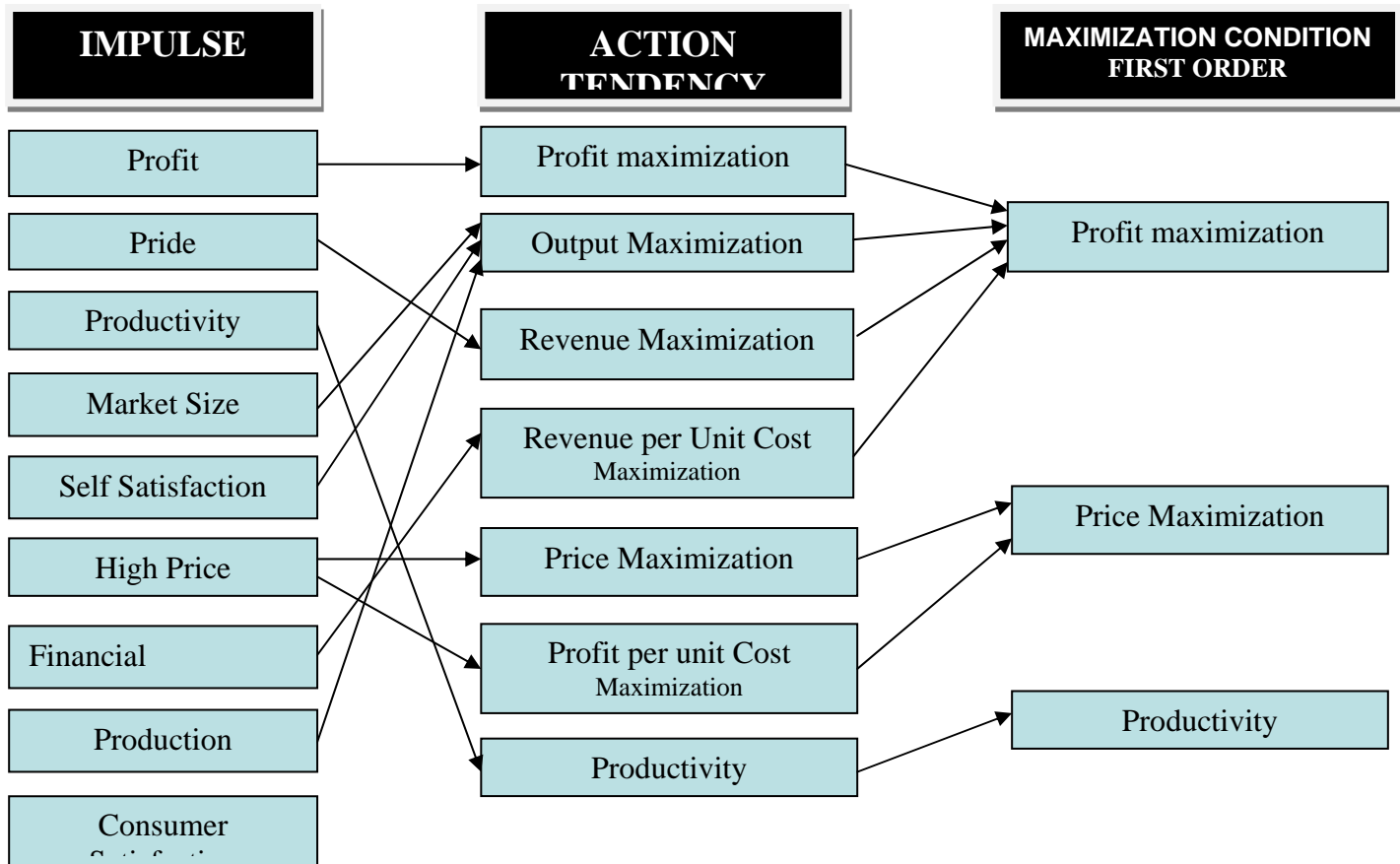
Institution: The Medium

Institution as the medium incorporates written and unwritten laws. North (1990) has also classified institution in to two parts, one formal and informal the other. However, his distinctions are not free from ambiguities (Hodgson, 2006). The law of the land has been taken as visible representative of institution. Unwritten laws incorporates religion, culture, social customs, taboos, social and individual values etc. All the variables of unwritten laws are related to one another.

The individual operates given an Institutionally Augmented Production Function.

Institutionally Augmented Production Function

The analysis of production mostly proceeds with solving a production function that occupies an important place in the activities related to production of goods and services at a firm level. A production function is defined as a functional relationship between physical inputs and physical output. We begin with the proposition that physical existence is governed by the individual. They should be treated as living being and therefore as institutional existence. The behavior of economic agents performing as institution may be captured by incorporating relative permittivity. In fact, permittivity is what permits the realization of the actual capacity. Given the complicated existence of the individual, in absolute term individual's capacity cannot be measured. The capacity of one person is governed by the others. Hence, two propositions have been taken (Singh, et al., 2008 a; Singh and Singh, 2008 b) that-

The realization of ith factor be proportional to the magnitude (given capacity) of factor i and the magnitude (given capacity) of its nearest factor (or composite factor) j of same type; and Realization of ith factor in the initial condition 'o' be inversely proportional to the inter-relationship between the factor i and j of same type (e.g., one labor is related to another labor) r_{ij}. This is used as deflator to eliminate overlapping, gives

$$F_{ipm} = \eta_{Fg}^{a} \psi_{Fg}^{b} F_{ipo} \qquad \text{(Singh and Singh, 2009)}$$ -------------------

(1)

Where F_{ipm} and F_{ipo} are the realizations of ith factor in the medium 'o' (initial) 'm' (other medium). η_F and ψ_F are the components of written laws and unwritten laws; g is the ratio of one to another medium; 'a' and 'b' are share of written and unwritten laws.

$\eta_{Fg}^{a} \psi_{Fg}^{b}$ represents the relative permittivity; and may be defined as the ratio of relationships between the two situations of institution. Vacuum like situation never exist in the real world. The institution of nature holds even in the vacuum (absence of institution). Therefore for analysis relative permittivity is solved for two alternative situations of institution from initial to present one. Therefore, Equation (1) can be translated for labor, capital, and technology as -

$$L_{ipm} = \eta_{Lg}^{\omega} \psi_{Lg}^{\rho} L_{ipo} \, ; \, K_{ipm} = \eta_{Kg}^{\tau} \psi_{Kg}^{\upsilon} K_{ipo} \, ; \quad T_{ipm} = \eta_{Tg}^{\phi} \psi_{Tg}^{\lambda} T_{ipo}$$ ----------------

-----(2)

Where ω and ρ are the share of written and unwritten laws for labor, τ and υ are the share of written and unwritten laws for capital and ϕ and λ are the share of written and unwritten laws for technology.

The productions function[4] with the incorporation of institution may be given as:

$$O = f\left(L_{ipo}, K_{ipo}, T_{ipo}, \eta_{Lg}, \eta_{Kg}, \eta_{Tg}, \psi_{Lg}, \psi_{Kg}, \psi_{Tg}; \alpha, \beta, \sigma, \omega, \tau, \phi, \rho, \gamma, \lambda\right)$$

Also, the Cost Relation[5] incorporating institutional and non institutional costs may be given as:

$$C = f\left(L_{ipo}, K_{ipo}, T_{ipo}, \eta_{Lg}, \eta_{Kg}, \eta_{Tg}, \psi_{Lg}, \psi_{Kg}, \psi_{Tg}; w_1, r_1, s_1, w_2, r_2, s_2, w_3, r_3, s_3\right)$$

Where $L_{ipo}, K_{ipo}, T_{ipo}$ are used to represent labor, capital and technology; $\eta_{Lg}, \eta_{Kg}, \eta_{Tg}$ and $\psi_{Lg}, \psi_{Kg}, \psi_{Tg}$ for their written and unwritten laws. $w_1, r_1, s_1, w_2, r_2, s_2, w_3, r_3, s_3$ are the marginal shares of factors for the given cost.

The Cost Function

Cost functions are derived functions[6]. They are derived from the production function which describes the available efficient methods of production at any one time. Cost is a function of output given as Cost =f (Output). With the change in impulses and their action tendencies, the cost equation will be changed, and hence the shape. If the action tendency is profit, the

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[4] In the present endeavor the production function is of Cobb- Douglass type has been taken.
[5] A liner function is defined for the cost relationship.
[6]The cost function in the light of institution has been changed and is given as:
$$C = f\left(O; \alpha, \beta, \sigma, \omega, \tau, \phi, \rho, \gamma, \lambda, w_1, r_1, s_1, w_2, r_2, s_2, w_3, r_3, s_3\right)$$

shape of the cost curve will be different from the action tendency of output, sales maximization or so on. And the firm's behavior will differ. Even with the incorporation of relative permittivity (i.e., the measure of institution) the shape of the cost curve will be different for profit maximization action tendency.

Given an action tendency the cost equation has been solved as under:

Action Tendency: Profit Maximization

Profit maximization is the action tendency for impulse profit. And after solving it, we have got the equation as:

$$C_1 = B + \left(\frac{O.r_1^{\beta}.s_1^{\sigma}.w_1^{\alpha}.r_2^{\tau\beta}.s_2^{\phi\sigma}.w_2^{\omega\alpha}.r_3^{\gamma\beta}.s_3^{\lambda\sigma}.w_3^{\rho\alpha}}{A.\omega^{\omega\alpha}.\rho^{\rho\alpha}.\tau^{\tau\beta}.\gamma^{\gamma\beta}.\phi^{\phi\sigma}.\lambda^{\lambda\sigma}} \right)^{\frac{1}{X}} \begin{bmatrix} \left[\left(\frac{\alpha^{X_2+X_3}}{\sigma^{X_3}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\sigma^{X_1+X_2}}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\alpha^{X_2+X_3}.\omega^X}{\sigma^{X_3}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}.\tau^X}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} \right] \\ + \left(\frac{\sigma^{X_1+X_2}.\phi^X}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\alpha^{X_2+X_3}.\rho^X}{\beta^{X_2}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}.\gamma^X}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\sigma^{X_1+X_2}.\lambda^X}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} \end{bmatrix}$$

Where, (C_1) represents profit maximization; π and B are used to symbolize profit and error term; and $X = \alpha(1+\omega+\rho) + \beta(1+\tau+\gamma) + \sigma(1+\phi+\lambda)$ and $X_1 = \alpha(1+\omega+\rho)$, $X_2 = \beta(1+\tau+\gamma)$, $X_3 = \sigma(1+\phi+\lambda)$.

We have got the same equation from the geometric programming technique.

Action Tendency: Output Maximization

Output maximization is the action tendency of impulses- Market size, Self Satisfaction and Financial Proficiency. We maximize output, subject to condition cost. Derived cost equation for output maximization (C_2) is as:

$$C_2 = B + \left(\frac{O.r_1^{\beta}.s_1^{\sigma}.w_1^{\alpha}.r_2^{\tau\beta}.s_2^{\phi\sigma}.w_2^{\omega\alpha}.r_3^{\gamma\beta}.s_3^{\lambda\sigma}.w_3^{\rho\alpha}}{A.\omega^{\omega\alpha}.\rho^{\rho\alpha}.\tau^{\tau\beta}.\gamma^{\gamma\beta}.\phi^{\phi\sigma}.\lambda^{\lambda\sigma}} \right)^{\frac{1}{X}} \begin{bmatrix} \left[\left(\frac{\alpha^{X_2+X_3}}{\sigma^{X_3}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\sigma^{X_1+X_2}}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\alpha^{X_2+X_3}.\omega^X}{\sigma^{X_3}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}.\tau^X}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} \right] \\ + \left(\frac{\sigma^{X_1+X_2}.\phi^X}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\alpha^{X_2+X_3}.\rho^X}{\beta^{X_2}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}.\gamma^X}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\sigma^{X_1+X_2}.\lambda^X}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} \end{bmatrix}$$

Action Tendency: Revenue Maximization

Revenue Maximization is the action tendency of the impulse 'pride'. We maximize Revenue subject to condition Output. Therefore, derived cost equation for revenue maximization (C_3) is given below.

$$C_3 = B + \left(\frac{O.r_1^{\beta}.s_1^{\sigma}.w_1^{\alpha}.r_2^{\tau\beta}.s_2^{\phi\sigma}.w_2^{\omega\alpha}.r_3^{\gamma\beta}.s_3^{\lambda\sigma}.w_3^{\rho\alpha}}{A.\omega^{\omega\alpha}.\rho^{\rho\alpha}.\tau^{\tau\beta}.\gamma^{\gamma\beta}.\phi^{\phi\sigma}.\lambda^{\lambda\sigma}} \right)^{\frac{1}{X}} \begin{bmatrix} \left[\left(\frac{\alpha^{X_2+X_3}}{\sigma^{X_3}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\sigma^{X_1+X_2}}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\alpha^{X_2+X_3}.\omega^X}{\sigma^{X_3}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}.\tau^X}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} \right] \\ + \left(\frac{\sigma^{X_1+X_2}.\phi^X}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\alpha^{X_2+X_3}.\rho^X}{\beta^{X_2}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}.\gamma^X}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\sigma^{X_1+X_2}.\lambda^X}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} \end{bmatrix}$$

Action Tendency: Revenue per Unit Cost Maximization

Impulse, Financial Proficiency is being observed by the action tendency Revenue per Unit Cost. Instead of profit revenue per unit cost $\left(\frac{R}{C}\right)$ has been employed. Derived equation for revenue per unit cost maximization (C_4) is as follows:

$$C_4 = B + \left(\frac{O.r_1^{\beta}.s_1^{\sigma}.w_1^{\alpha}.r_2^{\tau\beta}.s_2^{\phi\sigma}.w_2^{\omega\alpha}.r_3^{\gamma\beta}.s_3^{\lambda\sigma}.w_3^{\rho\alpha}}{A.\omega^{\omega\alpha}.\rho^{\rho\alpha}.\tau^{\tau\beta}.\gamma^{\gamma\beta}.\phi^{\phi\sigma}.\lambda^{\lambda\sigma}} \right)^{\frac{1}{X}} \left[\begin{array}{l} \left(\frac{\alpha^{X_2+X_3}}{\sigma^{X_3}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\sigma^{X_1+X_2}}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\alpha^{X_2+X_3}.\omega^{X}}{\sigma^{X_3}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}.\tau^{X}}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} \\[3mm] + \left(\frac{\sigma^{X_1+X_2}.\phi^{X}}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} + \left(\frac{\alpha^{X_2+X_3}.\rho^{X}}{\beta^{X_2}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\beta^{X_1+X_3}.\gamma^{X}}{\alpha^{X_1}.\sigma^{X_3}}\right)^{\frac{1}{X}} + \left(\frac{\sigma^{X_1+X_2}.\lambda^{X}}{\alpha^{X_1}.\beta^{X_2}}\right)^{\frac{1}{X}} \end{array} \right]$$

Action Tendency: Price Maximization

Price Maximization is the action tendencies of the impulse High Price. Here price is defined as the combination of Gross Profit Margin (GPM) and Average Cost Pricing (AVC i.e. $\frac{Cost}{Output}$). When we apply maximization condition GPM will be constant. And after solving it, we have got the derived equation of cost for price maximization condition (c_5) as.

$$C_5 = B + \left(\frac{O}{A}\right)^{\frac{1}{X}} \left(\frac{w_1^{\alpha}.r_1^{\beta}.s_1^{\sigma}.w_2^{\omega\alpha}.r_2^{\tau\beta}.s_2^{\phi\sigma}.w_3^{\rho\alpha}.r_3^{\gamma\beta}.s_3^{\lambda\sigma}}{\alpha^{X_1}.\beta^{X_2}.\sigma^{X_3}.\omega^{\omega\alpha}.\tau^{\tau\beta}.\phi^{\phi\sigma}.\rho^{\rho\alpha}.\gamma^{\gamma\beta}.\lambda^{\lambda\sigma}} \right)^{\frac{1}{X}}$$

Action Tendency: Profit per Unit Cost Maximization

Profit per unit cost Maximization is the action tendency of High Price. At this moment we maximize Profit per unit cost $\left(\frac{\Pi}{C}\right)$. Derived cost equation for Profit (Rate) Maximization (C_6) is given below:

$$C_6 = B + \left(\frac{O}{A}\right)^{\frac{1}{X}} \left(\frac{w_1^{\alpha}.r_1^{\beta}.s_1^{\sigma}.w_2^{\omega\alpha}.r_2^{\tau\beta}.s_2^{\phi\sigma}.w_3^{\rho\alpha}.r_3^{\gamma\beta}.s_3^{\lambda\sigma}}{\alpha^{X_1}.\beta^{X_2}.\sigma^{X_3}.\omega^{\omega\alpha}.\tau^{\tau\beta}.\phi^{\phi\sigma}.\rho^{\rho\alpha}.\gamma^{\gamma\beta}.\lambda^{\lambda\sigma}} \right)^{\frac{1}{X}}$$

Action Tendency: Productivity Maximization

When the impulse is productivity, the adopted action tendency is Productivity Maximization. Productivity in terms of labor has been used to solve the problem. Productivity (of labor) is being maximized, subject to constraint cost. The derived cost equation for productivity maximization (C_7) is given as under:

$$C_7 = B + \left(\frac{O.r_1^{\beta}.s_1^{\sigma}.w_1^{\alpha}.r_2^{\tau\beta}.s_2^{\phi\sigma}.w_2^{\omega\alpha}.r_3^{\gamma\beta}.s_3^{\lambda\sigma}.w_3^{\rho\alpha}}{A.\omega^{\omega\alpha}.\rho^{\rho\alpha}.\tau^{\tau\beta}.\gamma^{\gamma\beta}.\phi^{\phi\sigma}.\lambda^{\lambda\sigma}.(\alpha-1)^{\alpha}\alpha^{(X_1-\alpha)}.\beta^{X_2}.\sigma^{X_3}} \right)^{\frac{1}{X}} [X-1]$$

Composite Cost Equation:

The Composite Cost function is the linear combination of all cost functions emanating from respective Action Tendencies. That is –

$$C = \sum_{i=1}^{7} p_i C_i$$

Where p_i are the allotted weights to different action tendencies according to value preference. Here personal construct of the individual (institution at inner level) is being incorporated. Individual is not yielding in for maximization of objective function rather he gives weight to his different impulses and the act simultaneously. Therefore he is able to understand the actual cost. We get, in fact, three derived cost equations. The First order maximization condition for the action tendency profit, output, revenue and revenue per unit cost are same, and hence the derived equations are same. Action tendencies for Price and profit (rate) offer similar first order maximization condition and hence the equation. The weight for impulses is determined by the rank marked against different i*mpulse*

III

The data are raised by a schedule administered on the small and tiny industries of Varanasi Region of Uttar Pradesh (India) during Feb. - March 2008. The aggregate sample size is 196. Definitions and measurements of the variables are given in **Appendix 1**. For the qualitative observation, care is taken for objectivity. Reliability and validity of the scale is verified. Standardization of scores is done by using formulae:

$$\frac{\left(\text{Max}^{\text{m}} \text{ of score - Actual score}\right)}{\left(\text{Max}^{\text{m}} \text{ of score - Min}^{\text{m}} \text{ of score}\right)} \quad \text{for ascending ranks.}$$

Observations on all variables are standardized for making qualitative and quantitative variables comparable. The packages SPSS, MATLAB and MS excel have been used for computation.

IV

As the cost equations pertaining to action tendencies 1-4 (Profit Maximization, Output Maximization/ Revenue Maximization/ Revenue per Unit Cost Maximization) giving $C_1 - C_4$ are same, they are represented by one equation given by Figure 1. When output is zero the cost is 1.20 and output is one, cost is 1.235. As output increases cost also increases. There is gradual change in cost with the change in output. At 5 (output), cost is again at 1.275 and after 1.275 the cost starts to decline and at 6 the cost is at 1.265. However, **In the Absence of Institution**, the relationship has been shown in the figure (2). The change in magnitude and direction is apparent.
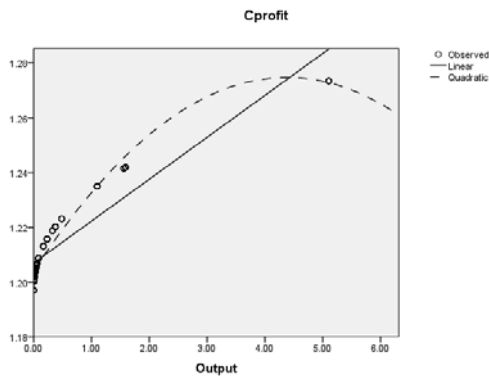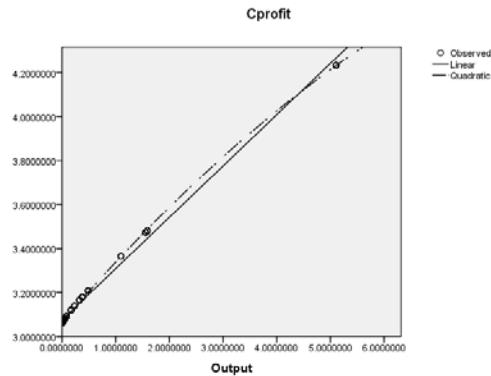
Figure: 1   Figure: 2

At the stage of zero production (fig. 1 & 2) the cost is 1.20 in the **presence of institution** while in the absence of institution the cost is 3.1. There is one important point also i.e., in the presence of institution the cost increases from 1.20 to 1.265 while in the absence of institution the cost is among 3.1 to 4.25. Institution supports the cost function of industry. Institution alleviates the production at lower cost. In the absence of institution the cost is increases in positive direction.

Cost equations pertaining to action tendencies 5-6 (Price Maximization and Profit per unit cost) giving $C_5 - C_6$ are same, they are represented by one equation given by Figure 3. In the **presence of institution** we have got quadratic shape of the cost curve. At the stage of zero production, the cost is 1.20. The cost curve gradually increases up to output level 4

(cost is 1.268), and starts to decline. **For the Absence of Institution**, the relationship has been shown in the figure 4. Cost increases with the increment in output.

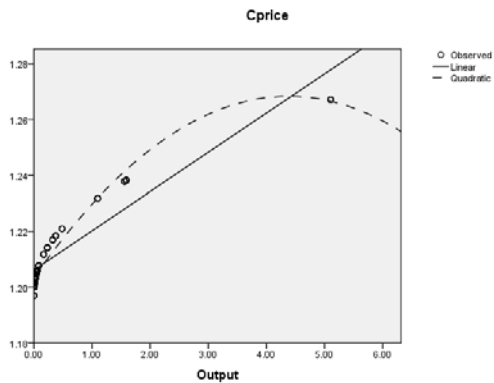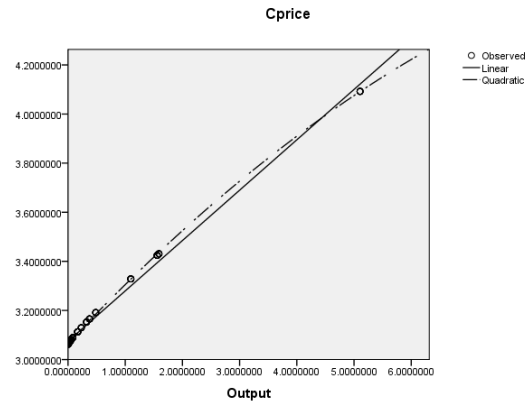Figure: 3   Figure: 4

In the presence of institution (fig. 3 & 4) at the zero production cost is 1.20 while in the absence of institution the cost is 3.053. In both cases we have get quadratic shape, but the slope is deeper in the presence in comparison to the absence of institution. The cost is very high in the absence of institution. Certainly the reason is institution and this facilitates the industry.

Cost equations pertaining to action tendencies 7 (Productivity Maximization) giving C_7 is given by Figure 5. In the presence of institution, cost increases from 1.20 to 1.236 and starts to decline after this. The curve is quadratic and slope is deep. In the absence of institution, we interestingly get downward sloping curve. This is quite different from other action tendencies. The curve (6) starts from 3.0625 (at zero production) and decreases gradually. Only for this one we get a downward sloping cost curve. And, at zero production, the cost is the highest in comparison to others, even in the absence of institution.

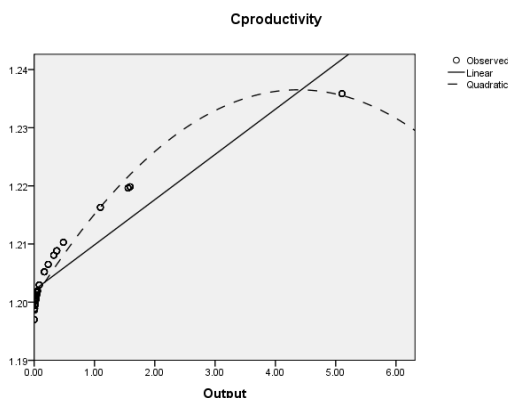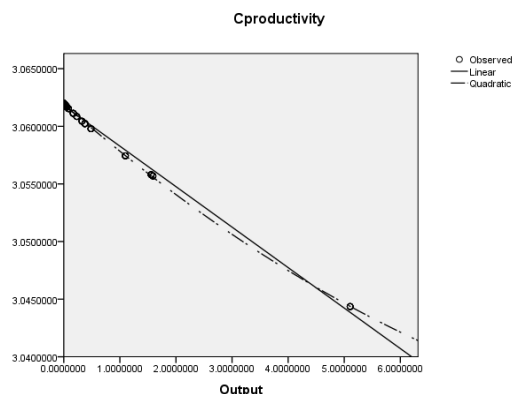Figure: 5   Figure: 6

In the absence of institution, for productivity maximization condition, we get downward sloping curve (fig. 5 & 6). The curve takes a possible curvilinear shape due to institution.

Determining the weights for Impulses

As the composite or the resultant cost function is the linear combination of different individual cost relationships emanating from respective impulses and action tendencies weight are determined by the rank accorded to the Impulses by the individual entrepreneur. Personal construct of the entrepreneur (or individual) is incorporated at this level. This is also the measure of institution from the subject of old institutional economics. To determine the weights (given by coefficient of regression) non- trivially, ranks are deflated by the rank accorded to the impulse- consumer satisfaction. The results of the regression are given in the Table 2.

Table: 2

IMPULSE	ESTIMATED WEIGHT
PROFIT	0.186862
PRIDE	0.137632
PRODUCTIVITY	0.196211
PRODUCTON	0.161894
MARKRT_SIZE	0.117248
SELF_SATISFACTION	0.127741
HIGH_PRICE	0.103463
FINANCIAL_PROFICIENCY	0.07483

The Resultant Impulse: The Composite Cost Function The Composite Cost Function 'C' is given by the curve in Figure 7. The nature of the curve is quadratic. At the zero production, cost is 1.458. The cost is increases up to 1.534 and starts to decline from this point.

Figure: 7
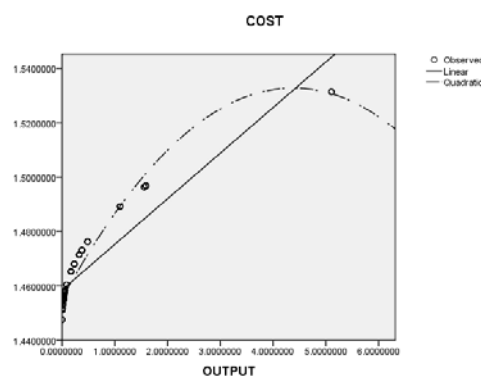
From the table 3 we can see that in the presence of institution for separate maximization conditions, cost is lower in comparison to composite impulse.

Table 3

OUTPUT	COST (institution present)			
	PROFIT	PRICE	PRODUCTIVITY	COMPOSITE
0	1.20	1.20	1.20	1.458
1	1.235	1.23	1.215	1.488
2	1.255	1.25	1.225	1.511
3	1.27	1.262	1.233	1.524
4	1.275	1.268	1.236	1.534
5	1.275	1.267	1.234	1.533
6	1.265	1.26	1.232	1.522

On the basis of single impulse, individual starts to run his industry and after some time he is unable to survive. Actual shape of the cost curve is different from his belief. Hence personal construct of the individual is important factor to understand the business.

V

To sum up, the approaches delineated upon as classical, managerial, behavioral and transaction cost, are in itself exaggeration of one or the other action tendency or impulse. They present the incomplete picture of the individual. Therefore loose on the predictability criteria of a theory. However, incorporation of institution at different stages not only adds to the predictability but also present a more complete picture of the individual entrepreneur. It is found that the major role in determining the shape of the cost curve is played by the institution at different levels such as the personal construct and medium he performs in.

The limitation of the study is that we have not explored the items of personal construct by having experiment our self, rather we have relied on the literature available.

Had we been able to unfold the construct of the individual greater number of dimension would have been at hand. This suggests the course of future research to arrive at new and more accurate shape of the cost curve.

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APPENDIX: 1

Definitions and Measurement of Variables

Variable Name	Definition	Measure/Scale
Labor (L)	Labor Hour	Sum of all types of workers- family & hired (male & female; skilled& unskilled)- Employed during the year considering 8 hours equal to 1 day. Male and female have been equally weighted.
Capital (K)	Capital Stock	Annual worth of fixed capital and working capital deflated by price index of the year.
Technology (T)	Ratio of Capital to Labor (For capital deepening) & Labor to Capital (For labor deepening)	K/L & L/K
Cost (C)	Annual Cost	Sum of the expenditure on labor, capital and market and all the expenditure that entered at the end of entrepreneur over the year including the cost of contract and hush money.
Output (Y)	Annual output	Monetary value of output over the year deflated by price.
Written Laws (Labor -η_{Lg} Capital - η_{Kg} Technology - η_{Tg})	Medium of written Laws of the same in which economic activities takes place.	Scales have been prepared for written laws to obtain the data by the schedule containing questions capturing the degree of hindrances caused by laws pertaining to economic activities. It contained question on labor in terms of wage law, minimum hour of work, etc.; questions on capital are property right, establishment of industry, etc. questions on technology are acquiring new machinery, intellectual property rights, marketing, etc.
Unwritten Laws (Labor - ψ_{Lg} Capital - ψ_{Kg} Technology - ψ_{Tg})	Medium of unwritten Laws in which economic activities takes place.	Scales have been prepared for unwritten laws to obtain the data by the schedule containing questions capturing the degree of hindrances caused by unwritten laws pertaining to economic activities. It comprises questions such as, impact of culture, religion, values, social customs, taboos etc. on labor, capital and technology (factors of production).