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PRICING RULE FOR NON-REVERSIBLE PROCESSING (PR-NRP) BY USING MATHEMATICAL TOOLS IN BIAS LINEARIZATION SLOPE ADJUSTMENT

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Abstract: In the scenario of price complexity the industrial process such as electricity generation or (CNG) liquid fuel production or such business process that required a very strong policy of pricing to accommodate the consumer demand against production.

A new mathematical tool suggest a logical pricing rule for such non-reversible business process by using mathematical distribution and costing algorithms the short fall of production due to high cost of generating parameters is compensated by using linear distribution and economize utility of resources. The major share of the consumer parameter is isolated by using non-production parameters of generation into direct relation of pricing the mathematical caricature used for simulation on the business model will be analyze by using mathematical tools for a definite workable pricing rule.

KEYWORDS: Pricing rule, non-reversible process, linear distribution, consumer parameters, profitability, pricing demand consumer parameters

1 INTRODUCTION

This paper suggest a workable solution which is directly applicable tool any complex production unit having a non-reversible business process.

If general the price factor is the key operator for profitable business process such as energy production, utility prices and consumption regulation.

The main idea of using mathematical tools is based upon the system simulation in a four-forwarding process fellow and its equivalent mathematical models as a simulations scheme of three or four parameters. The distributions algorithms will be applied.

A distribution algorithms will decide about the preference of parameters such as the cost of energy production is vital parameters next to the resource cost process, cost and the profit margin.

The mathematical workout for all vital parameters of a business process which is non-reversible in nature and is extra ordinary stretched by consumer demands, A workable distribution algorithms will suggest the equal and some-what logical by back for all costs.

The common mathematical procedure to deal with such complex parametric relationship between visible of costs and prices is to simulate on a mathematical caricature which provide a direct solution for profitability if the price factor is taken as independent of visible cost than the process of profitability will be suffered as the case of government controlled prices for same petroleum products.

If the procedures establish their own price structure to keep maximizing the profit or best to keep optimizing the ultimate profit, In a summarized statement it is established that profitability is inversely proportional to the visibility of cost as the visibility of cost in non-reversible process as adverse effect on consumer capability to pay.

2 Method And Methodology

The prime method to resolve the cost factor is selected from linear algorithm using multi-parameter matrices non-reversible business process.

Matrix A

Denote all factors involving visible cost on resource for simplicity only two parameters are taken into consideration

$$A = \begin{bmatrix} a_{00} & a_{01} \\ a_{10} & a_{11} \end{bmatrix}$$

Where,

a_{00} = Initial cost of available resources of used resources (cost data of natural gas)

a_{01} = Initial cost of serviceable resources

a_{10} = Final cost of resource in a process time laps

a_{11} = Final cost of serviceable and used resources

Matrix B

$$B = \begin{bmatrix} b_{00} & b_{01} \\ b_{10} & b_{11} \end{bmatrix}$$

Where,

b_{00} = Initial cost of process non-reversible

b_{01} = Initial cost of serviceable resources used process

b_{10} = Final cost of non-reversible process

b_{11} = Final cost of serviceable used resources

Matrix C

$$C = \begin{bmatrix} c_{00} & c_{01} \\ c_{10} & c_{11} \end{bmatrix}$$

Where,

c_{00} = Initial cost of distribution random process

c_{01} = Initial cost of serviceable regular distribution

c_{10} = Final cost of distribution random process

c_{11} = Final cost of regular distribution

3 Structuring of the NRP Tool

The final profitability is the mean of the final cost and the initial cost the price factor is hidden in linear solution of these three matrices linked by,

$$K = \frac{[A] + [B]}{[C]}$$

This relationship indicates a linear formulation for the general price rule of the system.

A generalized rule for linking the cost and profitability and the ultimate price is given by let the final price *(P)* and the cost price *(C)* and the profitability *(F)*.

Profit (F) will be equal to the difference of price in the cost.

START PROCESS

$$F \; \alpha \; [P - C]$$

$$F/_C \; \alpha \; \left[\frac{P - C}{C'}\right] \times 100$$

$F/_C$ is the profitability in percentage (%).

Numerically

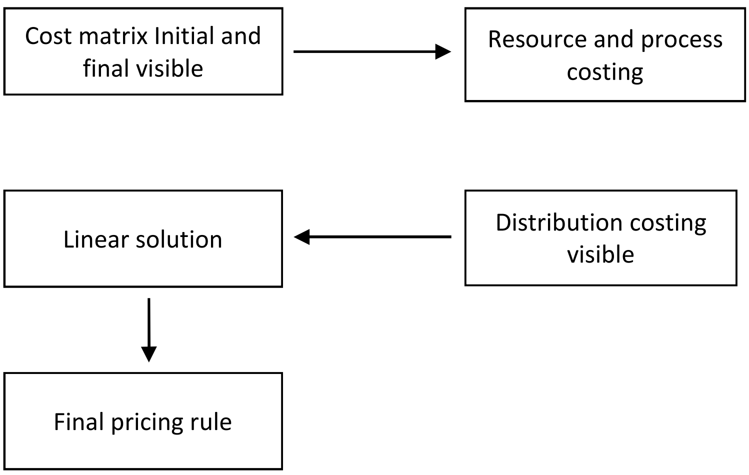
$F/_C$ in % = profitability = ρ

$$\rho = K\left[\frac{P - C}{C'}\right] \times 100$$

$F/_C$ is in (%) ρ in the non-manipulated parametric link the factor *K* with price and cost

4 ALGORITHMS

Three separate linear equations will be used to declare the actual value of each parameter denoted by the cost Matrix [A] and Matrix [B] and this will be distributed over the cost matrix of non-production, expenditure of distributions



5 EXTRACTION MECHANISM BY USING DATA INTERFERENCE

An empirical rule is to be external from selected data from available tables of cost price, cost selling, cost production profit.

Table 1. CNG VEHICLES VERSES SUPPLIES
for available resources for 10 years

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Number of CNG vehicles	1350200	1430300	1510000	1617500	1700100	1890030	2900000	3750000	4270000	6270000
Number of CNG station	1020	1190	1200	1320	1500	1850	2370	3032	3930	5880

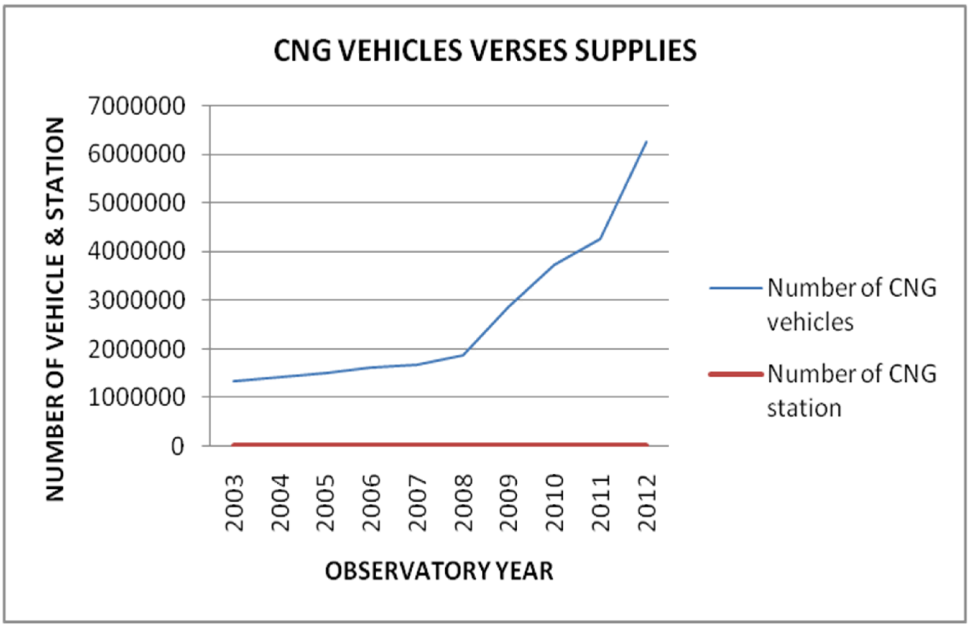


Fig.1 of table-1

Table 2. CNG
Selling price verses cost of production

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Selling price (Rs./kg)	28	30	32	21	27	34	42	55	58	62
Cost of production (Rs./kg)	18	22	22	16	21	28	35	40	41	45

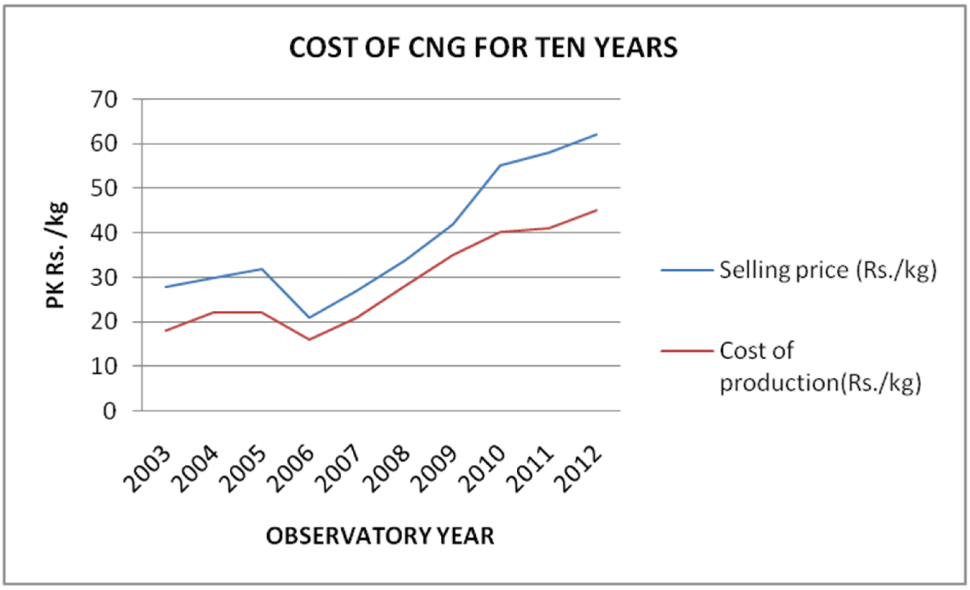


Fig. 2 of table-2

Table 3. production profitability verses distribution cost (the government taxes are (230%) on cost at production level then GST local octroi and transportation expenses

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Profitability verses distribution in %	1.15	1.05	1.25	1.35	1.05	1.13	1.15	1.25	1.35	1.45
Price factor	1.45	1.65	1.85	1.35	1.75	1.85	1.95	1.99	2.01	2.22

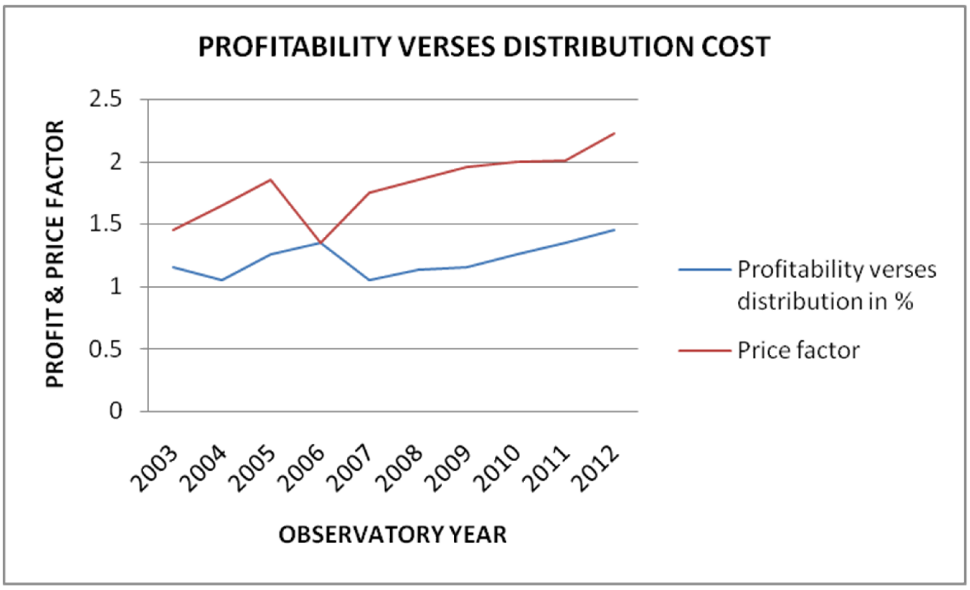


Fig. 3 of table-3

The algorithms to tabulate specific data clusters of time oriented parameters such as installation cost, process cost, distribution cost and management cost is architecture by fixed costs against time visible reducing the effect of successing and continuous insulation of certain primary cost.

A well selective data cluster is used to extract primary factor of visible cost on mean price of the product. In commercial calculation the normal price of CNG fuel is badly affected by various factors like storage, short, government regulations, load shedding and greed of pirate supplier.

The government authority oil and gas regulatory authority (OGRA) has directed to control over (CNG) distribution in supply chain schedule by implementing a very strict order for gas closer and timing for public sale. The most the mark able is the price declared by (OGRA) which include above 400% local taxes on the original cost of the fuel is almost four times when affected to sale the price rule extraction will follow the compromised between increasing visible cost and decreasing fixed costs. The increasing costs mainly belong to services facilities and management costs when as the fixed costs decreasing the passage of time due to depression aging utility and material degradation.

The mathematical work out for price rule extraction (PRE) is based as linking visible parameters which are increasing in time segments against the utilities which are also increasing due to the government benefits of the (CNG) fuel.

6 MATHEMATICAL WORKOUT

The initial data of visible cost will be taken for the past 10 years for modeling the cost factors. The forward costing will be projected by taken the 10 years future costs of visible process and other related parameters like maintenance work force, general labor, material infrastructure, machinery plant and other non-related variables. The distribution data indicating the cost of some consumer distribution will be sampled from existing energy user such as (WAPDA), K-Electric, HUBCO and private distribution like Tapal Energy.

All equation will be used via bar graph chart linear matrices to established the final solution in simulated environment simulation will used of the main system to extract the actual physical result suggesting the final price outlook of the process.

The non-reversible process required at least stable inputs as regular variable and the cost factors of such variable purely depends upon the mechanism and availability of the resources the nearest of the process mechanism.

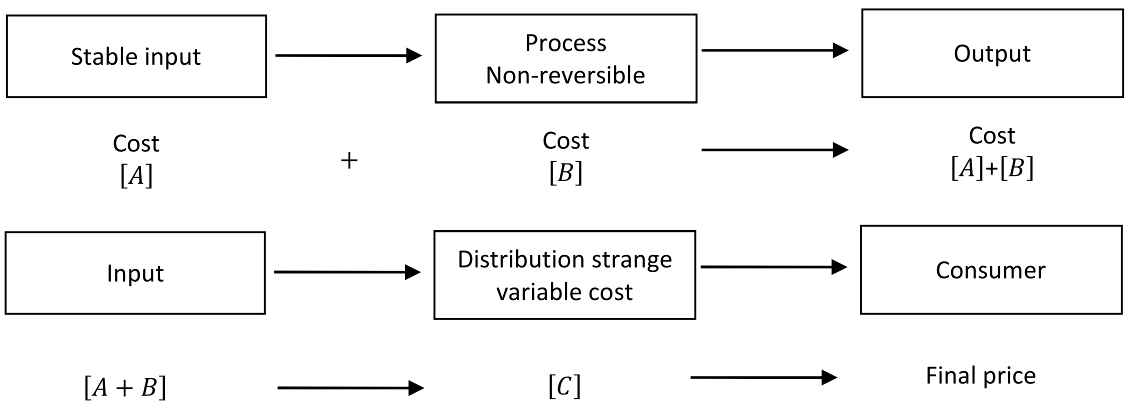


Table 4. DATA NORMALIZATION FROM TABLE-1, 2 AND 3 VALUES ARE IN BILLION PKR

Year	Selling price (Rs./kg)	$a_{00} = \frac{Selling\ price}{Minimum\ root}$	$a_{01} = \frac{Cost\ of\ Production}{initial\ root\ of\ testing}$	Profitability Vs distribution in percent a_{10}	Price Factor a_{11}
2003	28	1.33	1	1.15	1.45
2004	30	1.42	1.22	1.05	1.65
2005	32	1.52	1.22	1.25	1.75
2006	**[21]**	1	0.89	1.35	1.35
2007	27	1.29	1.16	1.05	1.75
2008	34	1.61	1.56	1.13	1.85
2009	42	2.00	1.94	1.15	1.95
2010	55	2.62	2.22	1.25	1.99
2011	58	2.76	2.28	1.35	2.01
2012	62	2.95	2.25	1.45	2.22

Minimum root 21

Table 5. (loss in production cost) 12%
Increase by 1 percent in each year

Year	$\boldsymbol{b_{00}} = \boldsymbol{a_{00}} +$ factor(0.88)
2003	1.33 + 0.88 = 2.21
2004	1.42 + 0.89 = 2.31
2005	1.52 + 0.90 = 2.42
2006	1.00 + 0.91 = 1.91
2007	1.29 + 0.92 = 2.21
2008	1.61 + 0.93 = 2.54
2009	2.00 + 0.94 = 2.94
2010	2.62 + 0.95 = 3.57
2011	2.76 + 0.96 = 3.72
2012	2.95 + 0.97 = 3.92

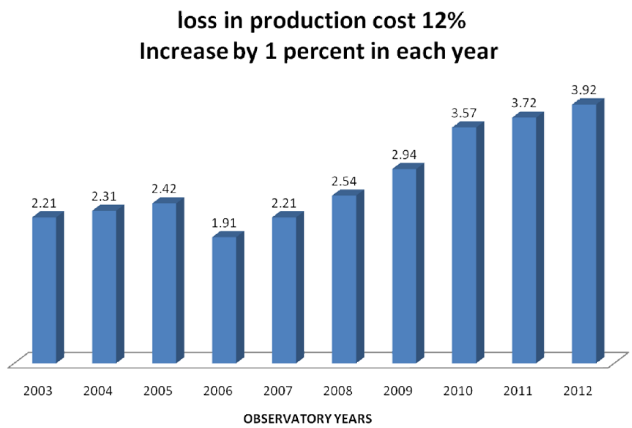


Fig. 4 of table-5

Table 6. Increased production cost 35%
Increase by 1 percent in each year

Year	$b_{01} = a_{01} +$ factor (0.65)
2003	1.00 + 0.65 = 1.65
2004	1.22 + 0.66 = 1.88
2005	1.22 + 0.67 = 1.89
2006	0.89 + 0.68 = 1.57
2007	1.16 + 0.69 = 1.85
2008	1.56 + 0.70 = 2.26
2009	1.94 + 0.71 = 2.65
2010	2.22 + 0.72 = 2.94
2011	2.28 + 0.73 = 3.01
2012	2.50 + 0.74 = 3.24

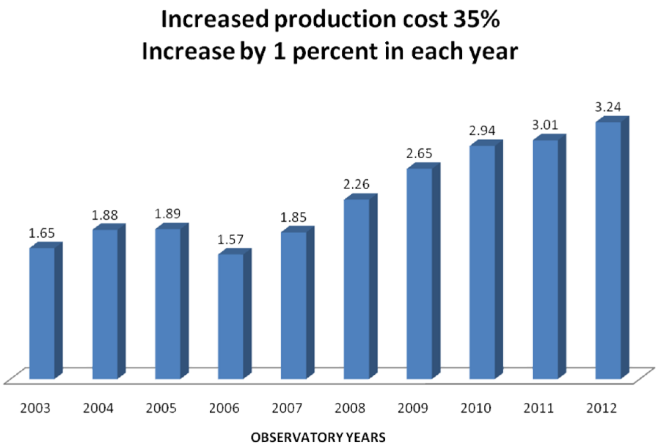


Fig. 5 of table-6

Table 7. Loss in distribution cost 9%
Increase by 1 percent in each year

Year	$b_{10} = b_{00} +$ factor (0.09)
2003	2.21 + 0.09 = 2.30
2004	2.32 + 0.10 = 2.41
2005	2.42 + 0.11 = 2.53
2006	1.91 + 0.12 = 2.03
2007	2.21 + 0.13 = 2.34
2008	2.54 + 0.14 = 2.68
2009	2.94 + 0.15 = 3.09
2010	3.57 + 0.16 = 3.73
2011	3.72 + 0.17 = 3.89
2012	3.92 + 0.18 = 4.10

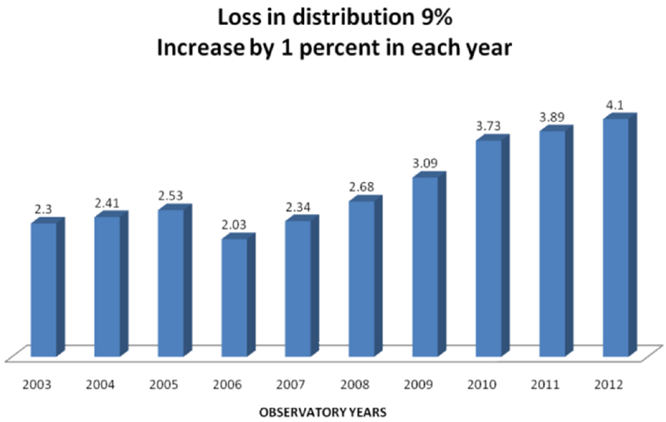


Fig. 6 of table-7

Table 8. Gain in distribution 75%
Increase by 1 percent in each year

Year	$b_{11} = b_{10}$ + factor (0.75)
2003	2.30 + 0.75 = 3.05
2004	2.41 + 0.76 = 3.17
2005	2.53 + 0.77 = 3.30
2006	2.03 + 0.78 = 2.81
2007	2.34 + 0.79 = 3.13
2008	2.68 + 0.80 = 3.48
2009	3.09 + 0.81 = 3.90
2010	3.73 + 0.82 = 4.55
2011	3.89 + 0.83 = 4.72
2012	4.10 + 0.84 = 4.94

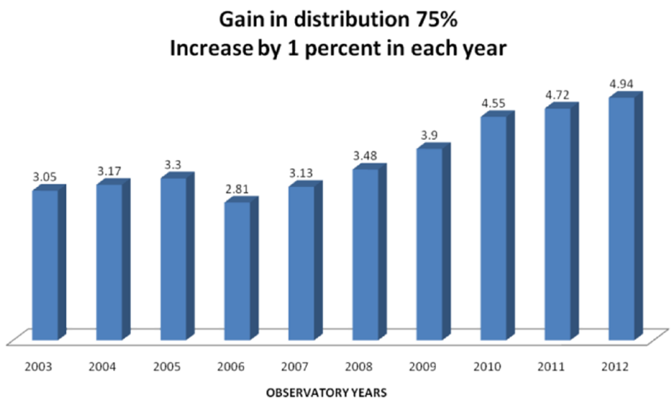


Fig. 7 of table-8

Table 9. Decrease in resources 109% in the sum of $(a_{00} + b_{00})$
Increase by 1 percent in each year

Year	$c_{00} = (a_{00} + b_{00}) -$ factor (1.09)
2003	(1.33 + 2.21) – 1.09 = 2.45
2004	(1.42 + 2.31) – 1.10 = 2.63
2005	(1.52 + 2.42) – 1.11 = 2.83
2006	(1.00 + 1.91) – 1.12 = 1.79
2007	(1.29 + 2.21) – 1.13 = 2.37
2008	(1.61 + 2.54) – 1.14 = 3.01
2009	(2.00 + 2.94) – 1.15 = 3.79
2010	(2.62 + 3.57) – 1.16 = 5.03
2011	(2.76 + 3.72) – 1.17 = 5.31
2012	(2.95 + 3.92) – 1.18 = 5.69

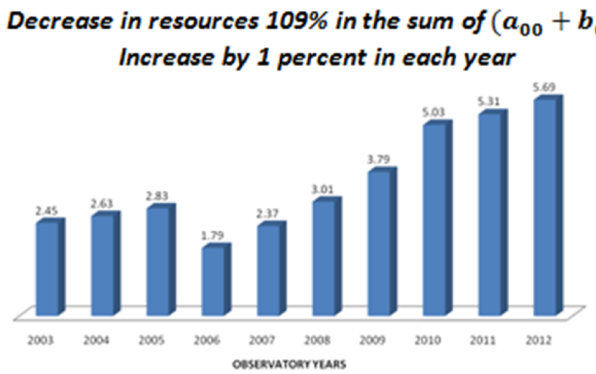


Fig. 8 of table-9

Table 10. Decrease in production 22%
Increase by 1 percent in each year

Year	$c_{01} = c_{00} +$ factor (0.22)
2003	2.45 + 0.22 = 2.67
2004	2.63 + 0.23 = 2.86
2005	2.83 + 0.24 = 3.07
2006	1.79 + 0.25 = 2.04
2007	2.37 + 0.26 = 2.63
2008	3.01 + 0.27 = 3.28
2009	3.79 + 0.28 = 4.07
2010	5.02 + 0.29 = 5.31
2011	5.31 + 0.30 = 5.61
2012	5.69 + 0.31 = 6.00

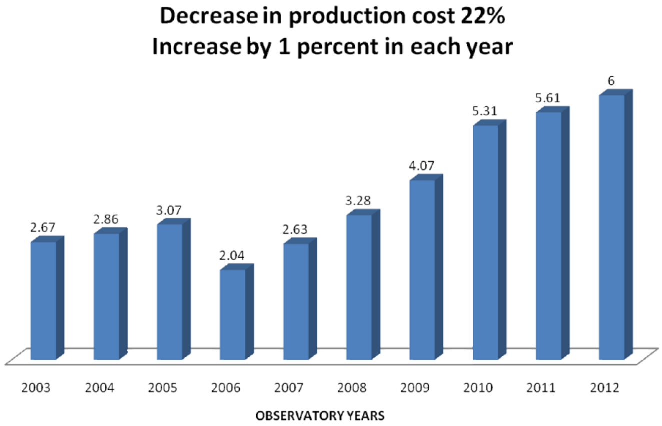


Fig. 9 of table-10

Table 11. Increase in production cost 37%
Increase by 1 percent in each year

Year	$c_{10} = c_{01}$ + factor (0.37)
2003	2.67 + 0.37 = 3.04
2004	2.86 + 0.38 = 3.24
2005	3.07 + 0.39 = 3.46
2006	2.04 + 0.40 = 2.44
2007	2.63 + 0.41 = 3.04
2008	3.28 + 0.42 = 3.70
2009	4.07 + 0.43 = 4.50
2010	5.31 + 0.44 = 5.74
2011	5.61 + 0.45 = 6.05
2012	6.00 + 0.46 = 6.45

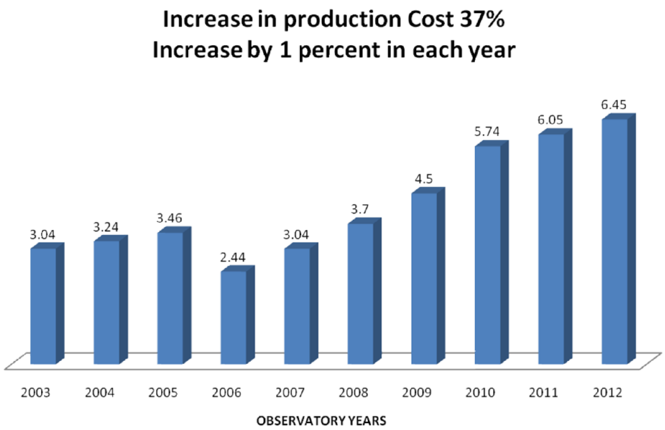


Fig. 10 of table-11

Table 12. Increase in resources cost 47%
Increase by 2 percent in each year

Year	$c_{11} = c_{10}$ + factor (0.47)
2003	3.04 + 0.47 = 3.51
2004	3.24 + 0.49 = 3.73
2005	3.46 + 0.51 = 3.97
2006	2.44+ 0.53 = 2.97
2007	3.04 + 0.55 = 3.59
2008	3.70 + 0.57 = 4.27
2009	4.50 + 0.59 = 5.09
2010	5.74 + 0.61 = 6.35
2011	6.05 + 0.63 = 6.68
2012	6.45 + 0.65 = 7.10

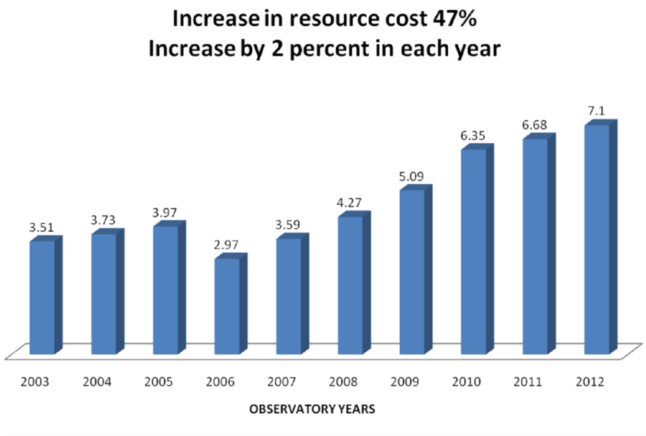


Fig. 11 of table-12

Table 13. Extraction the value of proportional coefficient K_1, K_2, K_3, K_4, K_5 and K_6

Year	$K_1 = \frac{a_{01}}{a_{00}}$	$K_2 = \frac{a_{11}}{a_{10}}$	$K_3 = \frac{b_{01}}{b_{00}}$	$K_4 = \frac{b_{11}}{b_{10}}$	$K_5 = \frac{c_{01}}{c_{00}}$	$K_6 = \frac{c_{11}}{c_{10}}$
2003	0.75	1.26	0.74	1.33	1.08	1.15
2004	0.86	1.57	0.81	1.32	1.09	1.15
2005	0.80	1.40	0.78	1.30	1.08	1.14
2006	0.89	1.00	0.82	1.38	1.13	1.20
2007	0.90	1.67	0.83	1.34	1.11	1.90
2008	0.97	1.63	0.88	1.30	1.09	1.15
2009	0.97	1.70	0.90	1.26	1.07	1.13
2010	0.84	1.48	0.82	1.22	1.06	1.11
2011	0.82	1.48	0.80	1.21	1.06	1.10
2012	0.85	1.53	0.82	1.20	1.05	1.10

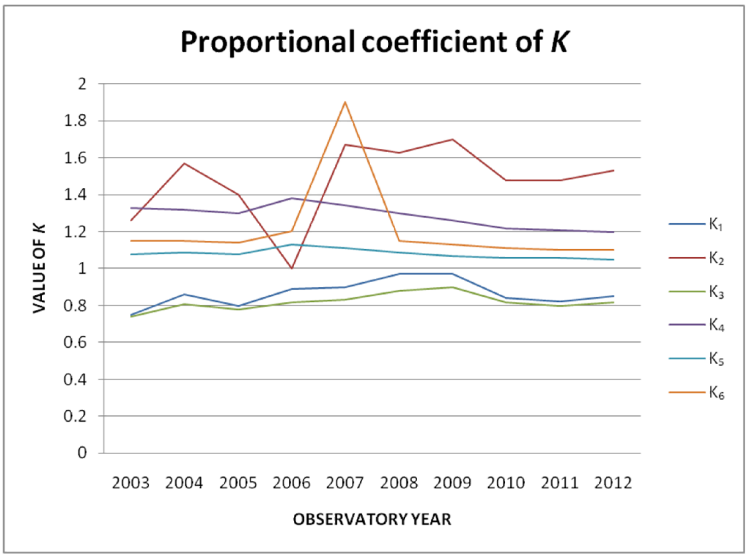


Fig. 12 of table-13

7 Formula Architecture

The constant coefficient of $K_1,\ K_2,\ K_3,\ K_4,\ K_5\ and\ K_6$ will be approximated from the data cluster accumulated over a sample period of ten years. The governing equation is established by tacking the double integral of cost variable m like between factor $K_n$and factor α_n, where *n* is from 0 to 5 for peak data and 0 to 10 for mean data. The factor K_n which is numerically extracted from available data for various cost. All cost as depicted from data table 1, 2, and 3.

$$P = \int_0^n \int_n^m [K(\rho . d\rho) + \alpha(c + d\rho)]dt$$

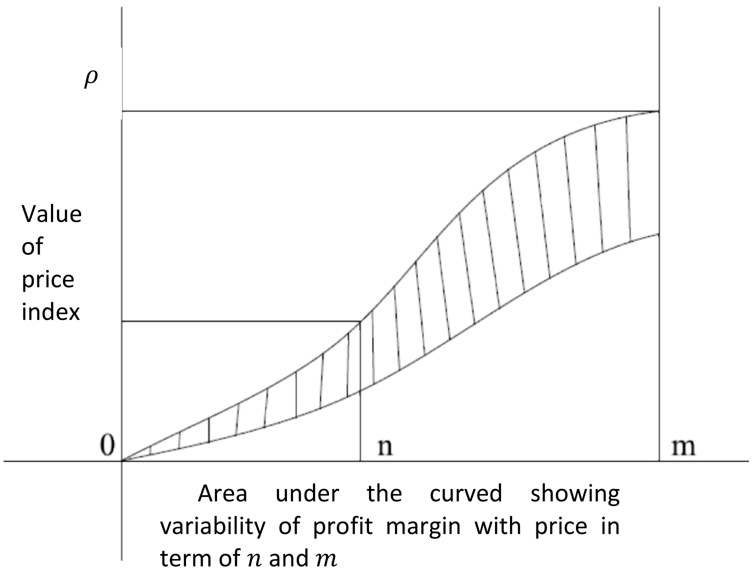


Fig. 13. Value of Variability of Profit Margin

Where

$$K = \sum_{0}^{n} (K_1 + K_2 + K_3 + K_4 \ldots \ldots\ K_n)$$

$$\alpha = \sum_{0}^{m} (a_1 + a_2 + a_3 +\ a_4 \ldots \ldots\ a_n)$$

8 RESULT & DISCUSSION

The outcomes of mathematic workout on (PR-NRP) for CNG in a distributed factor with fixed index profitability calculated as 0.8 which makes about 80% of general earnings on production cycle. It is a proved result for a moderate price structure which guarantees a sustainability and profitable working for such non-reversible process. The main goal of this working is to adjust the non-uniformality of price structure. The government taxation inflation and the greed for maximizing profit tends to de-stabilize the commercial market price of CNG and therefore the supply demand ratio and encounters charioted simulations. The result workout is in confirmative of the first proposed price structure and also guaranteed sustainability for inward development for the expanding market of CNG used and on the backend of it. The supplier and CNG handlers can be controlled without any marginal damage or liquidation.

9 CONCLUSION

The formula indicated the relation between two opposite various parameters and the mean value of any two corresponding. A new idea in technology may reduce the cost factor, the process factor and the price factor as well as the utility factor or the ultimate performance factor. The performance of CNG in a vehicle is not very good. Its fuel value and the continuity of combustion which tends to slow down. The PR-NRP is affected values estimated for price stability and sustains ability of the process and well calculated in all domains investment, management, services, marketing.

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