

A Study on the Kerosene Distribution and Related Subsidy Administration and the Generation and Assessment of Options for Improvement of the System

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Abbreviations

AP	Andhra Pradesh
APL	Above Poverty Line
BPL	Below Poverty Line
CCC	Credit Card Company
CCT	Credit Card Terminal
CMIE	Centre for Monitoring the Indian Economy
CPI	Consumer Price Index
CSO	Central Statistical Organisation
DPID	Drought Prone Area Programme
EOI	Expression of Interest
FPS	Fair Price Shop
GoI	Government of India
HUF	Hindu Undivided Family
IIMA	Indian Institute of Management, Ahmedabad
ISEC	Identity cum Subsidy Endowment Card
ITDG	Intermediate Technology Development Group (formerly)
LPG	Liquefied petroleum gas
LS	Local Shop
NCAER	National Council of Applied Economic Research
NGO	Non Government Organisation
NSS	National Sample Survey
NW	Net worth
PCA	Per Capita Allocation
PDS	Public Distribution System
PRI	Panchayat Raj Institutions
PSU	Public Sector Undertaking
RFP	Request for Proposal
RFQ	Request for Qualification
RO	Retail Outlet
SKO	Superior kerosene oil
SPV	Special Purpose Vehicle
TCE	Total Capital Employed
TF	Task Force
TPDS	Targeted PDS
TSO	Traditional sources of energy
WPI	Wholesale Price Index

Executive Summary

The study on allocation, distribution and subsidization of kerosene was carried out with the following specific objective:

- *To identify the major deficiencies and reasons for the same in the existing system*
- *To propose either modifications to the existing or a new system to overcome the deficiencies identified*
- *To outline the manner in which the proposals may be implemented effectively*
- *To assess the gains from implementing the proposed system.*

Observations on the Existing System:

- *There is clear evidence that a significant percentage (about 40) of kerosene is diverted out of the PDS and sold at higher prices.*
- *The manual information and control system to keep diversions and leakages in check is completely ineffective.*
- *The commission paid to the distribution channel, in particular to the retailers of kerosene does not make the business financially viable.*
- *The rents being earned by those associated with the distribution channel for kerosene are very large.*
- *The rent extractors have become so well entrenched over time that it is plausible that other agencies in the system and even the regulatory process itself may be hostage today to their influences.*
- *The indirect losses from use of sub-optimal fuel mix, product mix and investment decisions are very large and may harm the economy significantly in the long term.*
- *The subsidy through uniform low pricing of kerosene, though intended for the poor, is in fact not reaching them as they are in no position to buy much of the kerosene allotted to them even at the low issue prices being charged by the fair price shops.*
- *In sum, kerosene subsidy has become the ever-growing white elephant of the Indian economy.*

Alternative to Existing System:

- *It is imperative to bring into play information and communication technologies so as to break the stranglehold of the distribution*

channel by capturing information at the point of sale and thereby creating a permanent audit trail of all relevant transactions.

- *It is imperative to empower the target segment, the BPL families, by providing them with the freedom to choose the manner in which they would like to consume the subsidy intended for them.*
- *The well-documented failure of TPDS (Targeted Public Distribution System), implemented on an experimental basis, clearly demonstrates that tinkering with the existing system would not achieve the twin goal of benefiting the really poor and not-benefiting the non-poor.*
- ***The direct subsidy scheme, which is based on free market pricing of kerosene, and therefore a radical departure from the current method of uniform low pricing is the answer for achieving effectiveness of subsidization.***
- *The subsidy is to be disbursed to the poor through smart cards and the accounting of disbursement is to be done using systems similar to those used by credit card companies.*
- *The purchasing power put in the hands of the beneficiaries would allow them to use it for spending on their choice of commodities and services and thereby not only enhance the use of subsidy to the full but would also add greatly to their welfare.*
- *The proposed system would almost completely eliminate the indirect losses arising from distorted choices since the price of kerosene would be market determined and therefore not relatively cheap compared to alternate fuels.*

Implementation of Proposed System:

- *A task force (TF) must be set-up for implementation, with wide-ranging powers and full financial backing of the government of India so as to be able to function autonomously.*
- *The task force should consist of eminently qualified individuals with diverse skills and known for their integrity and appreciation for the significance of the task to be performed.*
- *The critical task of identifying the beneficiaries at micro-level should be done using all possible sources of data and information (outlined in the report) so as to minimize both, Type I and Type II errors, that is, chance of exclusion of genuine beneficiary and chance of inclusion of spurious beneficiary in the list of target beneficiaries.*

- *The disbursement of subsidy should be such that the disbursement is recorded at the point of transaction and get immediately captured in a large centralized database, thereby creating a permanent audit trail, akin to operation of credit cards (details outlined in the report).*
- *The activities associated with initial identification of beneficiaries, disbursement of subsidies and updating the list of beneficiaries is to be done by well-qualified private agencies.*
- *The operations of the system should be monitored by an SPV to be specially created for the purpose and working under the broad supervision and direction of the task force.*
- *The SPV and the TF should ensure full transparency of operation of the private vendor and the scheme by making public all relevant information on the operation of the system and opting for periodic audit of operations.*

Gains from the Proposed System:

- *The immediate gain to the exchequer from the proposed system, due to market based pricing of kerosene would be an estimated inflow of Rs. 14000 crore per year by way of additional taxes.*
- *This gain from additional taxes, based on certain assumptions, is expected to rise to over Rs. 37000 crore in 2010-11.*
- *The gain to the economy and society at large from elimination of indirect losses due to sub-optimal choices of fuel-mix, product-mix, and asset mix would be immense as they would be completely eliminated in the new system.*
- *The most important gain however is that the beneficiaries would be in a position to fully utilize their entitlements and spend the same on products and services of their choice, significantly enhancing thereby the utility of their consumption.*

Chapter 1

Antecedents and Introduction

Petrofed approached the Indian Institute of Management, Ahmedabad (IIMA) to carry out a study on the distribution system and subsidy administration mechanism for kerosene in the second week of July 2005, and IIMA in response sent Petrofed a proposal for the same. IIMA proposed that it would carry out an initial study evaluating the current system and suggest a suitable approach that could overcome many of the shortcomings of the current system. The terms of reference for the study were as follows:

1. To assess the existing system of subsidisation and distribution of kerosene.
2. To examine alternative mechanisms including direct subsidisation to improve the system.
3. To examine the alternative arrangements for subsidy and distribution administration, from the point of view of reach, access, feasibility, robustness and cost-benefit tradeoffs so as to suggest possible changes required to make the system more effective.
4. To outline the implementation issues associated with the recommendations and suggest appropriate method for effective implementation of recommendations.

The objective of the study by the IIMA would be to examine the possibility of improving the subsidy administration for kerosene with a view to minimize diversions, leakages, and to remove the prevailing distortions. The study would suggest institution of a new system that is cost effective, easy to administer, and is yet able to fully take care of the needs of the segment of population that requires subsidies.

Possible Post Study Actions

The recommendations of the study may lead to possible revamping /reorganisation of the system.

Chapter 2

Issues in Priced-Based Subsidisation

Price Based versus Direct Subsidies

Subsidies in India including that on kerosene have been delivered through lowering of price of the goods and services to be subsidised. The resultant excess demand has been dealt with by rationing the commodity/service through parallel distribution arrangements principally the PDS (Public Distribution System). The experience with regard to subsidization of kerosene for the economically weaker sections of society reveals inefficacy in dealing with diversion, adulteration of other products using kerosene, increasing subsidization cost, and most importantly denial of subsidy to the target groups. It has been argued that these issues have arisen not merely on account of the limitations in the administrative machinery but due to the inherent weaknesses in the system arising from the relatively low price of kerosene generating perverse incentives to indulge in diversion and adulteration. It is estimated that the diversion may amount to as much as half of the quantity of kerosene released for distribution through the PDS. The diversion to the open market at this rate in 1999-2000 amounted to over 5000 MMT. At a price difference of Rs 10 per litre between cost and the price at which the kerosene was sold, this meant a loss of Rs. 5000 crore to the exchequer. This amount does not monetise the significant losses to the society that arise from adulteration of other products using kerosene.

As opposed to price-based subsidy, direct-subsidy approach could be more efficient as demonstrated by a small-scale implementation in the PDS system in Andhra Pradesh (AP). The implementation revealed that AP was able to bring about significant savings and far better targeting. The 10th Plan Document, p. 371, points to realized savings of 20,000 tonnes of rice and 7100 kilolitres of kerosene, as a result of use of coupons system. This scheme may have had other shortcomings, but was evidently successful in reducing diversion. The experience of AP and elsewhere in the world point to the desirability of direct subsidisation with appropriate features and contextual modifications that would ensure better delivery of the subsidy to the

targeted users. An appropriate direct subsidy scheme would reduce the costs of subsidy administration and more importantly would remove the perverse incentives /distortions that result from price-based subsidies.

Distortions due to Price-based Subsidisation

When subsidies are rendered through low differential prices (price based subsidies) and through the product being distributed through parallel channels many distortions and perversities arise. It would be useful to describe the chain of causation so that significance of the distortion is well understood and recognised.

The lower prices to the user usually lead to increased demand. The extent of effect of prices on demand depends upon the price elasticity of demand. While for oil products as a whole the revealed price elasticity of demand in the short to medium term is small, for particular products it could be large. In the case of kerosene, since the product is inferior to both LPG and piped gas (LPG/ NG) and superior to traditional sources of energy (TSOs), at particular levels of income the shift from TSOs to kerosene and from kerosene to LPG can be expected to take place. Given the current average incomes in urban areas in India, at non-distorting prices, the demand for kerosene would be low since the LPG supply system exists and most people opt for LPG in comparison to kerosene. That there is some demand for kerosene is because kerosene is priced relatively even lower although both LPG and kerosene are subsidised, and there is no convenient replacement for electricity given the large scale failure of the public electricity system to reach customers and provide uninterrupted power.

Lower prices for kerosene could create options for diversion of kerosene meant for the subsidised segments to other uses. Besides hotels and restaurants, low priced kerosene meant for cooking and lighting application in households could be diverted to industrial uses and for generating electricity through portable gensets. Adulteration of other fuels especially diesel is another possibility. While these effects may not be large over the initial period of introduction of the price differentials through a

controlled distribution channel, the continued existence of price differentials is bound to make this almost inevitable due to strong incentives for diversion.

The diversion of kerosene, if priced higher to reflect its cost of production, would reduce considerably. This would result in recovery of revenue loss due to increased demand for the adulterated fuels (diesel/ petrol).

In response to the potential for diversion for adulteration or alternative use due to price-based subsidy, the system of delivery and marketing invariably is more control oriented and is monitored by multiple agencies. This increases the cost of distribution and subsidy administration.

Efforts to find seeming technological “solutions” to reduce diversions are likely to lead to imposition of higher costs upon the society and the distributing entity. Since the supply to the households would have to be restricted to reduce diversion while catering to the genuine needs, shortages and consequently allocation/ rationing problems are created. The simple task of marketing and distribution of a product like kerosene on commercial lines thereby eventually gets converted into a complex administrative-cum-policing problem.

Since price-based subsidies imply that commercial players are awarded their costs, the issue (unproductive activity) of assessing the costs of commercial players would arise. Use of standard costs results in imposition of either unnecessary costs on the system (due to pressure from the players) or if the costs reimbursed are inadequate the system attracts only those players who are willing to recover their ‘costs’ through unethical practices. Significant manpower and administrative resources of the government then gets involved in determining the appropriate costs to be reimbursed to reduce the motivation for indulging in unethical practices.

The price difference between the low priced kerosene for household and the high priced kerosene for other uses or for diesel creates opportunities for “arbitrage”. This in turn creates rent seeking in the society and breeds corruption. Dealerships of

kerosene are then valued not because they are genuine business propositions but because they provide opportunities for generating significant amounts of rent. As rents get institutionalised and well entrenched, it becomes increasingly difficult for the incumbent government to clean-up the system. There is a distinct possibility of capture of the regulations by the regulated (dealers and transporters).

Adverse selection with regard to kerosene dealers is inevitable and the oil marketing companies are then forced to accept as their dealers the wrong kind of people. Dealerships then increasingly become mechanisms to earn incomes from rents rather than from efficient distribution of the product (kerosene).

The need to minimise misuse and diversion would imply the need for creating parallel channels for distribution. The exclusive parallel distribution channels are operable only at high costs since the considerable synergies in joint distribution of oil products (with other products) is lost and economies of scope are unavailable.

Consumers using diverted kerosene (such as when used in diesel engines) add to pollution (given less efficient usage, and greater production of effluents), and to other social costs (lower engine life, greater intensity of overhaul, slower performance on the road). When such practices are resorted to by some elements in the user industries (such as trucking and industry) and when these industries are competitive without much market power (as is certainly the case of the trucking industry), it is inevitable that the practice spreads widely. This results in entrenched corruption. Monitoring in such a situation would at best be ritualised.

The need to produce more of the subsidized product adversely impacts the product-mix of the refineries and makes them operate at sub-optimal levels. This enhances the cost of production and adds a dead weight on the society due to increased costs. Also, when distorted price differentials remain for long it is quite possible that investment decisions too get influenced by these prices. In case the distortions cease at some point in the future, the investment choices, the asset structure and the operating

processes used could become inefficient as these may not be alterable in the short term. These are value reducing distortions and could harm the economy significantly.

Since commercial orientation is affected by such policies, disinvestment and privatisation become if not impossible, certainly less valuable. Such policies may result in significant reduction in flow of capital in the key sector and harm the nation's long-term interests. In the situation of "price arbitrage", privatisation also has the danger of internalisation of the available "arbitrage" within the private entities, since unlike public sector undertakings (PSUs) the private entities would be able to "arbitrage" with much greater ease.

If the price-based subsidy is also meant only for a group of consumers and not for all (as is the case with the kerosene), diversions provide huge rents for those indulging in the same. As a result, the legitimate requirement of those intended to be subsidised competes with the diversion demands of the rent seekers. In this competition, only the rent seekers can win since customers have no way of collectively demanding their due, since collective expression is beset with free rider debility. The rent seekers can and do organise quickly to ensure that their interests are protected. Large rents would also allow rent seekers to share their rents with those who are supposed to monitor them and the system of rents can become so well entrenched that the government willy-nilly becomes a hostage to the influence that the rent seekers can exert on government decision making.

The overall result of these effects would be to considerably heighten the fiscal cost of a rupee of delivered subsidy. The social costs as outlined can be much larger than the value of the subsidy actually delivered to the poor.

In sum, these perversions result in creation of nightmare for effective governance. The energies spent in trying to battle diversion and adulteration are wasteful and the associated direct and indirect costs are huge. The system also does not result in effective delivery of subsidy to those who need subsidization. There is therefore an

urgent need to design alternative system for distribution and subsidization that is more effective and free of distortions.

Chapter 3

The Current System of Kerosene Allocation and Subsidisation

The Ministry of Petroleum and Natural Gas with inputs and requests from the state civil supplies ministries allocates PDS kerosene to various states leaving it to the states to make further detailed district-wise (and down to the fair price shop level) allocations. The quantity allocated to different states has evolved from the actual off take and additional demands made by the states over the years. Since different states used different criteria for PDS supplies, the allocation figures for 1992-93 on a per capita basis were widely different across states.

The differences on a per head basis, ought to have shown larger PDS allocations to the poorer states where more people are below the poverty line. The allocations however have been much higher for the richer states – reflecting the total off-take of kerosene for all purposes rather than merely the off-take by the poor.

Kerosene subsidy is a universal subsidy to all household consumers of kerosene (and of course, to the beneficiaries of diverted kerosene!). Kerosene being superior to the use of agricultural wastes and residues, firewood, coal, charcoal, shrubs and bushes (TSOs) for cooking, and LPG being superior to kerosene, the impact of the kerosene subsidy on society may be stated as follows: The LPG subsidies have largely benefited the middle and upper middle classes, and the kerosene subsidies have benefited the middle, the lower middle and the poor classes. The kerosene subsidies have gone to the poor through their use of kerosene in oil lamps for lighting and not as fuel for cooking, particularly in rural areas, since TSOs continue to be far cheaper and therefore more affordable fuel for cooking for the poor. [Gangopadhyay, S. (2004), World Bank (2004), Pandey (2002)].

If the lowest two deciles at the all India level (it may mean even the lowest four deciles in states like Bihar) are considered and the kerosene demand for these segments are estimated from the NSS Data, then not more than 15% of the PDS

kerosene could have gone to these segments. Since the allocations were driven more by total off-take, the allocations per se were much less effective in directing subsidised kerosene to the poor. The impact of subsidised kerosene on the consumers, especially among the non-poor, would have been significant and would have increased its demand. The price effect of kerosene on the poor in raising its demand would have been much less since it had to compete with TSOs for cooking (but not for lighting). The benefit to the poor would have been more due to the lower price as subsidisation makes it less expensive. Even here the data (NCAER, 2005) suggests that the diversion from PDS is about 39% out of this about 18% gets diverted back to household consumption. As a result, the poor (some of whom may not even be having ration cards) may actually be paying “market prices” for kerosene rather than the lower PDS prices. [Another study based on the NSS 2002, Gangopadhyay, S. (2004) estimated the diversion from PDS supplies to be of the order of 50%].

Between 1993-94 to 1997-98, the government increased the allocations by around 3% per annum to reduce the variation in the per capita allocations across states. Higher growth “was allowed” to states with lower per capita allocations but in no case the allocations were reduced during the period. The enhanced allocations arising from the same would have also increased the diversions, and possibly even the net diversions (that going outside the household sector).

Box: The Large (First Order) Distortions in “Targeted” Price Based Subsidies: The Case of Kerosene

Schematically the argument above may be illustrated as in Fig.1 The demand for the poor in quadrant 1 and for the non-poor in quadrant 2 are laid out as in the figure. The quantity axes increases from the origin in either direction. There is an elastic portion and an inelastic portion or tail for both the poor and the non-poor. Since the poor on all India basis constitute less than 20% the inelastic demand of the poor is much smaller. Recognising also that the richer of the non-poor would be consuming more LPG and electricity rather than kerosene the net effect is still to leave the overall consumption of the poor much smaller than that of the non-poor. The NSS data that the bottom two deciles consume less kerosene may be recalled. Had there been no subsidisation (or only a direct subsidisation for a few that did not change market prices), and had distortionary taxes been not there, then oil marketing companies would have priced kerosene close to other important fuels and at a price *OI* (say).

Also assume that the cost of production is not sensitive to output levels – this ignores the deadweight losses in refineries having to tweak their outputs to match the distorted demand that results from price based subsidisation. This means we have use a constant cost supply curve rather than an upward sloping one since the alternative in not producing kerosene is not in the first instance to change overall output levels but to produce other refinery fractions that are in demand. Thus refineries under a rational tax regime would produce diesel to replace the kerosene now being used to adulterate diesel.

Given the subsidisation through prices and allocations of the kind described above then the subsidy bill for the government = $P3.P3'*(O1.O3)$, and *O3* is the PDS price. [We have used the length (or movement from one point to another $P3.P3'$ to refer to the difference in prices; and similarly for quantity differences] . Then with no diversions etc the consumer benefit arising out of the subsidisation is the area $P1'.P1.Dp.Dr$. With diversion of the order of 30% given by the difference between $Dr.Dp$ and $D1'.D1$ being 30% of $Dr.Dp$, the weighted average price is *ODI*, which therefore reduces the consumer benefit substantially. If half of the diverted quantity makes its way to the household markets then the consumer benefit improves to $P1'.P1.D2.D2'$. This assumes that all private incomes generated in diversion and adulteration take the form of rents and directly unproductive activities. It also assumes that all consumers proportional to their purchases in the PDS purchase in the open market sustained by the re-diverted quantities of kerosene.

Relaxing the latter assumption to recognise that in the diversion it is the poor rather than the non-poor would loose out more on their PDS supplies, and would have to buy a greater share in the open market. the effective price of kerosene (weighted average of PDS and open market prices) paid by the poor would be higher. Thus the final delivered subsidy to the poor $O1.P1.D3.M$ is a small fraction of the total subsidy cost.

In 1998-99, another attempt to reduce interstate variation was made with the added objective of bringing all the states to a minimum level of 10 Kg per annum per capita. A one-time high growth of 8.58% over 1997-1998 allocation was provided. The rule of distributing growth in inverse proportion to their per capita allocation (PCA) was followed. High growth in allocations took place for the states of Orissa, Bihar, MP, Rajasthan and Uttar Pradesh, which till then had been low on allocations per capita. This process of enhancing allocations ignored the actual demand for kerosene. In the absence of any natural addition to demand for kerosene, increased allocations might have stimulated diversion of kerosene even more. It is therefore hardly surprising that the NSS studies show that as much as 50% of PDS kerosene was diverted out of the sector. In 1999-2000, the government belatedly realised the need to moderate the per capita allocation of kerosene by linking it with the consumption of LPG, which was rising. A modest corrective effort was made using this reasoning. The ceiling of 24 Kg per capita of kerosene was introduced, and the “shortage” was allocated more to states with higher PCA.

In 2000-01, there was no change in the total kerosene made available to the states. However, certain states such as Andhra Pradesh, Rajasthan and Maharashtra surrendered SKO (superior kerosene oil) in lieu of release of additional LPG connections. The surrendered SKO was allotted to states with a lower per capita allocation and only to such states that were at levels lower than the 12.4 kg national average then. SKO allocation for the year 2001-2002 to various States/UTs was reduced by about 4.5% over the previous year. The formula adopted for reducing kerosene allocation against LPG connections released was as follows:

No. of LPG connections released x 5.5 (average family size) x Per Capita Allocation (PCA) of the concerned State = Quantity of SKO to be reduced.

Over the next several years the reductions in allocation occurred recognising the increase in the LPG connections, and the present policy is essentially based on the same reasoning. The belated recognition of the need to moderate kerosene allocations linking SKO allocation with the LPG connections while in the right direction is

nevertheless faulty on account of the following reason. It is almost certain that even in 1993 the demand might have been more than the allocated PDS kerosene with the result that the growth in allocations till 1999-2000 itself might have resulted in excess demand induced by the low prices of kerosene. That means that the reduction possible in kerosene allocation is from a higher base than warranted.

The adjustment for LPG is substantially incomplete

The matter of adjustment for LPG cannot be done over a unit of analysis as large as a state, since districts vary widely on the intensity of use of LPG. Urbanisation, availability of TSOs and per capita incomes, also vary widely within a state. TSOs, especially agricultural residues and waste, are an important determinant of demand for kerosene. Indeed even within a district there would be wide variation across talukas. The idea of allocations based on past off-take with the intention of reducing PDS supplies would have to be done at the taluka level to limit diversions due to lower demand for kerosene. This would mean asking the states to surrender what has not been sold of the allocation on a taluka-wide basis. However, the issue of allocation within states has been left entirely to the states!

States have no incentive to surrender kerosene quota. The subsidy is entirely borne by the centre, and given possible nexus between state officials and the distribution channel, there would be a strong pressure to increase /maintain the allocations. In some situations where additional LPG connections are being requested for by the states, this incentive may be moderated by the need to balance the trade-off between kerosene allocations and LPG connections.

The idea of moving to a uniform per capita allocation is in conflict with the reality that the kerosene subsidy, being essentially a universal subsidy, would result in more demand from the middle class, that is, from the non-poor and for diversions. The releases of kerosene are made on quarterly basis. These need to be lifted before the end of the corresponding quarter. The quantity of SKO not lifted during the period lapses. Revalidation and carry forward of the lapsed quota is not generally permitted.

State Governments have been arguing for increased allocations. The Centre has asked the National Council of Applied Economic Research (NCAER) to carry out a study to determine the demand for kerosene and the extent of its diversion. Awaiting the report of NCAER, allocations have been maintained for the year 2005-06 at the previous year's level. Additional allocations were also made during that year to meet "urgent" demands of PDS kerosene from some states.

Although the NCAER has submitted its report in 2005, no action to correct the vast distortions induced by the current subsidy administration has been initiated so far. After all adjustments made thus far, the distribution of subsidised LPG and kerosene per capita is as brought out in Table 1. The figures in the Table have been computed using the kerosene equivalent of LPG. The figures recognise LPG's higher delivery of energy to the cooking pan per kg of product as compared to kerosene. The ratio of 28:15 has been used for converting LPG to kerosene based on ITDG, c. 2000 from "Rural Energy and Development", The World Bank, Washington D.C., 1994. These figures show a high 78.56 kgs of kerosene equivalent consumption per person for Delhi in 2003 as compared to a low of 11.15 kgs of consumption for Bihar! Indeed there is a very good inverse correlation between poverty levels across states and their use of subsidised fuels. Since these levels are based on actual sales of subsidised LPG and kerosene rather than on allocations (which anyway are very close), there is clear evidence of the perversity of kerosene (and LPG) subsidies as far as their being meant for the poorer segments of society.

The data in table 1 can be further analysed to arrive at the determinants of the joint demand for LPG and kerosene. The question is of more than academic interest since the kerosene allocations are increasingly being linked to LPG connections and the kerosene subsidy being justified in the interest of the poor.

The data on "cooking fuel demand" as in Table 1 (across 19 states for the years 1994 to 2003) from the CMIE database, Business Beacon, were drawn up as a panel and were subjected to panel regression analysis on likely determinants of demand such as population and per capita income. Being essentially on account of household use

(cooking and lighting use), the kerosene equivalent of cooking fuel is expected to be most importantly determined by the population and the per capita income, since all families cannot be assumed to be above the level of income where their need for cooking fuel is fully met from fossil fuels (the poor would be using substantial amounts of TSOs, and their purchases would also be limited by their incomes), there would be a per capita dependence too.

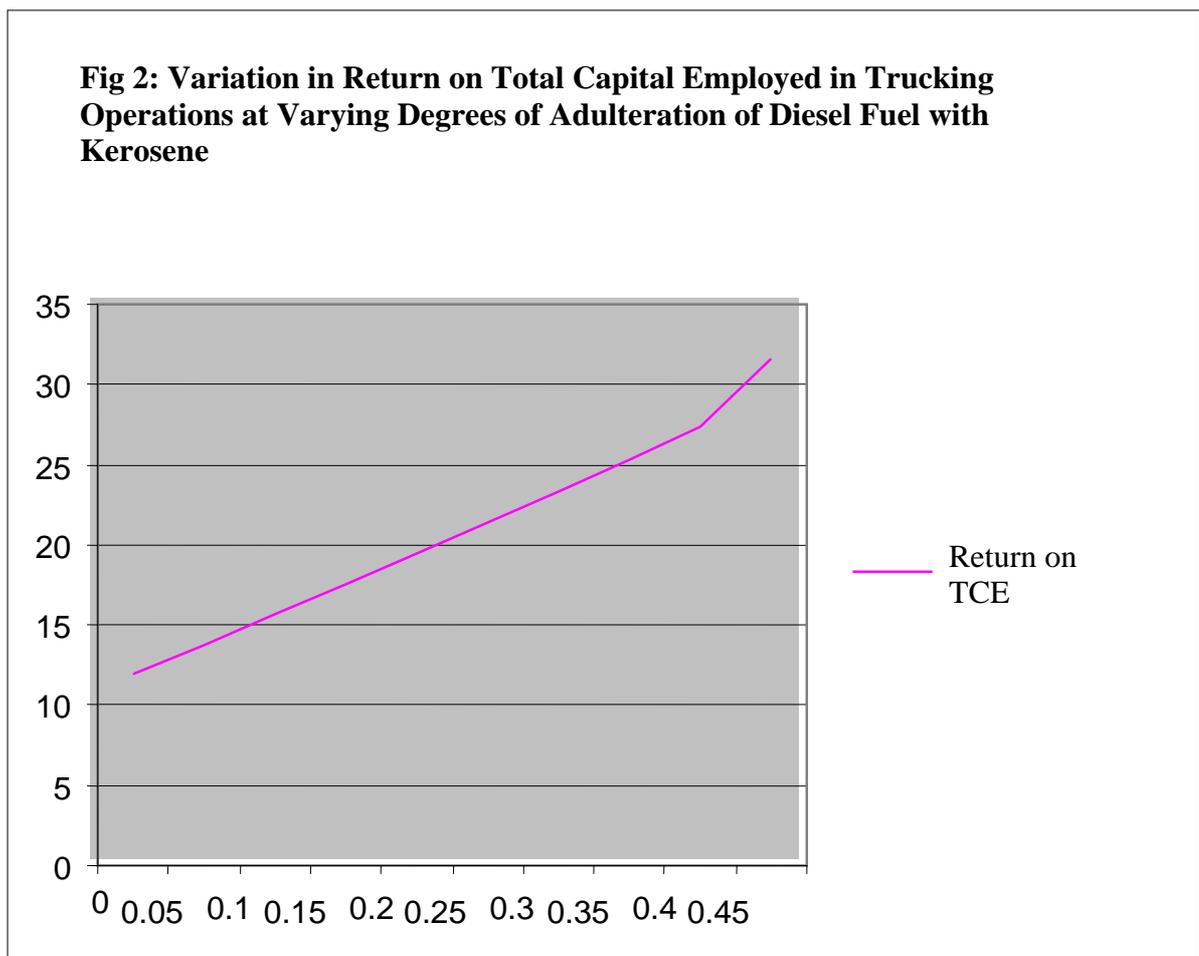
Table 2 contains the results of regression of cooking fuel on these two dependent variables with State dummies for the constant term (18 to take care of 19 states in the data). As expected, the coefficients of both independent variables are highly significant. The State dummies for most of the States are also statistically significant, implying that there are significant state level determinants not accounted for by the two independent variables.

The set of independent variables is expanded through inclusion of real GDP in the “transport, storage and communications” sub-sector. This variable captures much of the interstate variation suggesting that the “demand” arising from the sector (truck and bus transport would be an important component of the sector besides the railways, airlines and telecom) could explain the unexplained variation. The explanation power of the model improved, as indicated by the improvement in the overall F-ratio. The results are reported in Table 3. Thus diversion of the kerosene for use in the transport sector (adulteration of diesel with kerosene) is suggested by the result.

The above inference was also confirmed in our interviews with people in the field including truck operators, oil company officials, besides private parties involved in distribution and FPS (Fair Price Shop) owners and civil supplies officials. The relative economics of truck operations using kerosene is brought out in Tables 4 and 5 based on the information we were able to gather from the field. There are vast returns to adulteration of diesel with kerosene at Rs. 10 per litre price differential based on the cost adjusted price of PDS kerosene when diverted. Even if the price of kerosene is at Rs 18-20 per litre, the returns to adulteration are large. Thus rents are large and the sharing of rents between truck operators and fuel retailers is inevitable. This means

that ROs (Retail Outlets) sourcing kerosene could adulterate with the knowledge of the user to allow both to make very significant gains.

The returns are particularly sensitive to the rate of interest. With decline in the borrowing costs, the returns to adulteration have increased. Improvement in mileage of trucks works against adulteration since there is a decline in the mileage if kerosene is mixed with diesel. The higher cost of engine overhaul arising out of more frequent overhaul is inconsequential factor since the returns from price differential are very large. Only at kerosene price of Rs. 30.50 does the incentive to adulterate vanish. We have used the most conservative figures for mileage reduction, mileage between overhaul and reduction in engine life to arrive at this cross over point. The workings are presented in Tables 4 and 5 and Fig. 2.



Chapter 4

The Current System of Distribution of Kerosene

Much of the distribution responsibility really lies with the state civil supplies departments. Oil companies release quantities of kerosene from their oil depots to licensed dealers based on authorisation from the state government in quantities as determined by state government civil supplies department. The company's responsibilities end with the off-take of the requisite quantities. The company of course checks licenses, the trucks and dealers for their equipment including the storage tanks, measuring and dispensing equipment. It is also responsible for safety. The wholesalers, who typically own or lease trucks, distribute the product to the retailers – the PDS kerosene shops. Typically dealers have territory wherein the quantities are determined by the department of civil supplies for each fair price shop (FPS). Small quantities of non-PDS white kerosene are also intermittently lifted typically by the ultimate bulk consumer and by the dealers on behalf of the ultimate consumer. Besides PDS shops, sometimes individuals are attached to the retailers as vendors who deliver kerosene from mobile carts and cycle rickshaws in areas not served by permanent FPSs.

The dealer's truck that lifts stocks from the company depots typically carries a list of shops to which kerosene is to be delivered. If a particular FPS owner does not have the ready cash, kerosene is not delivered to the shop. Each FPS shop receives supplies at least twice a month. Despite several attempts, we could not get the details of the quantities sent, the differences if any at the FPS level, the records of the allocations and off-take at each level even on a sample basis. Ostensibly based on the population, the number of ration cards, the number of BPL (Below Poverty Line) cardholders, and the number of LPG connections in an area, the allocations on a FPS level are determined by the civil supplies and then aggregated over taluka, district and state levels. In Gujarat since the kerosene allocations do not distinguish between the BPL and non-BPL families, the allocations are logically much more influenced by the number of LPG connections in a particular area than due to the number of families holding ration cards in the area. Since the number of families with cards is close (but

not equal) to the number of the families as such, the number of LPG connections is ostensibly the determinant of the allocations of kerosene.

There is little documentation over and above the usual documentation carried by oil tankers that kerosene tankers carry. Drivers have a list of dealers to cover, which does not change with the particular load but is merely a cyclostyled list of the shops in the route of the truck/ dealer. Even the addresses therein may be incomplete. Given this limited documentation, there is little that the kerosene truck can be checked for. Only if it is found way outside its distribution territory can the truck driver be questioned. Wholesale dealers are continually reallocated among the various distribution territories. The motivation in doing so is to prevent the wholesaler and the retailer from colluding to divert kerosene meant for PDS sales to other uses, including diversion to the transport sector and diesel retailing.

Retailers pay with cash for the kerosene that is supplied to them. They distribute the kerosene to ration cardholders as per their entitlements. The quota for the retailer is ostensibly the sum of the entitlements of all cards that come under the retailer; and for the dealer the sum of the entitlements of all the retailers in the distribution territory /beat.

Civil supplies ministry officials continually visit the retailers and the dealers' premises to check and carry out inspection; and sometimes even suspend the license of retailers for diversion.

Our Observations on the Distribution System

1. Rotating dealers among the various distribution territories through the state means that any checks on particular territories or dealers to throw up incriminating evidence of diversion is prevented.
2. The records of the dealers and the retailers are apparently maintained to near perfect consistency. This more than anything is an evidence of forced

matching of the figures. The records showing that the releases match off-take month after month are not possible unless the releases at the smallest distribution unit are way below the demands. This is unlikely since the allocation of 2 litres per capita per month is probably very close to the demand from consumers who would be using only kerosene for their cooking.

3. The system of control over diversion of kerosene is based on verification of records maintained manually. Hence, any reconciliation down the chain is difficult. Any independent check on the same would take so much time and effort that it is hardly ever likely. In addition, in the absence of any conflict between the parties that form the chain, everyone in the chain is likely to benefit from diversions., It is therefore unlikely that the records would not match but for any minor inadvertent discrepancies.
4. The actual distribution of PDS kerosene seems to be or is likely to be far below the off-take on records and dealers are likely to divert truck loads to industry and for adulteration on own account as a truck operator or more typically to diesel oil retailers (ROs) or to the kerosene black market.
5. What reaches the typical retailer is a fraction of the sum of the entitlements on the cards. Since individual consumers cannot cumulate their allocations and cannot claim this month the kerosene which was not received last month, the strategy of the system is to release a minimal quantity over a few days (typically two or three days) of the month, so that only those consumers, who can stand in long queues and who have ready cash, can hope to purchase kerosene at the rationed price. In many areas, the supplies seem to be larger than the demand since those with LPG connections would have very small or no demand for kerosene.
6. The entries at the retailer (FPS) level are barely visible carbon copies of small bills on which the ration card numbers are entered. There is no way to prevent

an FPS owner from entering the number of all cards irrespective of whether or not kerosene was purchase by the cardholder.

7. The FPS shop owners' ability to divert the kerosene for adulteration and industrial use (i.e. to exercise "arbitrage") also seems limited since his scale of operation is small. The only way for him is to dispose off the PDS kerosene in the local market for white kerosene, would be through decolouration of the PDS kerosene. This would be possible only if there is sufficient demand in the local market for white kerosene. Alternatively, he could divert some small quantities to black market but this would be costlier as he would have to shift it away from the shop.
8. It is likely therefore that diversions occur at the dealer level in connivance with the civil supplies officials, who can use their bargaining power vis-à-vis the FPS owner to make him fill up the requisite numbers of false vouchers. As a result, only a part of the kerosene that is lifted by the dealer is likely to be actually sent on the retailers. The current system of record keeping and entrenched nature of relationships due to long history of price-based subsidy on kerosene and other items enables this diversion without effective controls.
9. The FPS owners maximum possible income assuming zero operating expenses is approximately Rs. 11000 to Rs. 15000 per year; the latter figure being for the prevailing "average sales" (average release per FPS+Ferrywala), and the former if the releases are fully adjusted for LPG connections and LPG sales. Thus, the income of an FPS shop owner is no more that Rs. 15,000 per year. On food distribution, his income is even lower (Planning Commission, 2005). It is estimated that about one third or more of the gross income for a combined FPS owner arises on account of his kerosene business. Clearly therefore, the FPS owner survives only because he gets a share in the "arbitrage" income arising from diversion. Given the low bargaining power, the FPS owner has become a mere tool for rent extraction with a small part of the rent being

shared with him to keep him in business and continue to 'participate' in the deception.

The dealer is likely to be the key player in the adulteration and the diversion business. The rents generated are so large that it can be shared with the retailers (FPS owners) and civil supply officials. Indeed such is the design of the system that there is nothing much that supervision or monitoring can do. The *mamlatdar* and the lower civil supplies officials including the inspectors are likely to get involved since all inspections can at best be ritualistic. Even a rudimentary analysis reveals that even for routine checking of all FPS for consistency of sales with releases (assuming that there is any incentive to do so other than merely as a ritual), the time required would involve services of over 300 inspectors. The salary and travel cost for inspection would add another Rs.0.25 per litre to the cost of kerosene released (Tables 6, 7 and 8 and 9).

As estimated in various ways, diversion and adulteration is likely to be a big business and the administration would be willy-nilly a party to the same.

In case of Gujarat, the kerosene release as per official figures is currently around 15 KG per capita. Including the LPG releases and going by the gross sales of kerosene reported by the oil companies, the kerosene equivalent of cooking fuel released (kerosene + $(28/15)*LPG$) is as high as 32 kg per year which is approx. 40 litres per year per capita. This is far too high since nearly 60% of the population in Gujarat is rural and consumption of TSOs would also be considerable.

Going by the reported figures of kerosene and LPG releases and the electricity sold to consumers, the expenditure per month per household works out to around Rs. 288 c.2003-04. The NSS (National Sample Survey) figures for fuel and light that also includes consumption of firewood and TSOs, besides things like matches, petrol and diesel, are close to this figure. We can therefore infer that there is significant diversion outside the household sector. Since the detailed break up of NSS expenditure on fuel and light was not available to us, we had to resort to this comparison. Others who had

access to the data have shown that the NSS based expenditure estimates of kerosene are far lower than the kerosene release figures (Table 9). In the year 2003 977.29 million litres of kerosene were released under the PDS. The NSS59 valid for the same year can account for only 483.60. Thus the diversion is to the tune of 493.7 million litres or 50.5%. A 140 million litres were also reported as non-PDS kerosene consumption bought at prices much higher than PDS prices. Thus there is a reflow of 14.4 % so that 36.1% of the PDS kerosene in Gujarat is used for adulteration and in non-household applications. (Morris, S., Ajay Pandey and S.K. Barua (2006) forthcoming, IIMA mimeo, “Kerosene Subsidies in India: A Direct Subsidy Scheme to Overcome Large Distortions”)

The dealership business is overly profitable - the wholesale margins are the same as retail margins! And the profitability of the transport operations is high. The oil companies do the allocation of up-liftment of SKO, dealer-wise, based on the quota allotted to the state and the districts/resellers allotted by the State Government. The trucks and the drivers are registered with the Oil companies so that they are able to ensure that the vehicle is right and the drivers are identified. The trucks are loaded by the Oil companies based on the order received from the dealer and the draft paid by the dealer. The dealer collects cash from resellers in advance. The Dealer distributes the products to the resellers without unloading the product into any intermediate storage most of the times. If he has storage license then he gets Rs. 43 per kl more as commission. The Dealer gets no compensation for distributing SKO to the resellers located within 10 km of his 'depot' or storage location. The cost of distribution else is recovered from the resellers who in turn are allowed to charge the same from customers. Price allowed by State : Rs. 8589 per kl and price paid to oil companies : Rs. 8141.90, that is, margin of 447.10 per kl. See table 10 for a rough estimate. They reveal that the annualised returns are in excess of 200% .

The final purpose for diversion arises from the industrial demand where the use of kerosene is either necessary or is a substitute for other more expensive fuels. Similarly, its application in portable generation sets and in marine engines used by the

fishing industry is cost saving in comparison to possible alternatives. But these demands are not large enough to support the vast diversion of kerosene. The adulteration of diesel with kerosene in the road transport business and more generally in diesel engines coupled with selling of kerosene for cooking and lighting to the households through black market are the chief avenues for large-scale diversions.

We have examined the economics of kerosene use in trucks making conservative estimates of the cost saving and these are considerable enough to make adulteration a major business (Table 5).

Box:
Performance Evaluation of Targeted Public Distribution System (TDPS)
(Programme Evaluation Organisation, Planning Commission, Government of India,
March 2005)

The key findings of the exercise are as follows:

About 57% of the subsidized grain from the Central Pool does not reach the target group.

Of the 57%, about 36% is siphoned off the supply chain and 21% reaches APL families.

Only about 23% of the sample FPSs are financially viable. The rest survive of leakages and diversions of subsidized grains.

GOI spends about Rs. 3.65 to transfer Re 1 to the poor.

TDPS suffers seriously from targeting errors of exclusion and inclusion.

To improve TPDS, the committee has two broad recommendations:

1. Streamline BPL identification through:

- use attributes that are easily observable and leave less room for arbitrariness,*
- use wealth ranking methods – similar to the method used in AP, MP and Rajasthan for implementation of DPAP,*
- get a fresh survey done by reputed survey organizations (NSSO, NCAER, ICSSR),*
- active involvement of PRIs for identification of the poor – for example similar to the process for used for PRA (Participatory Rural Appraisal),*
- create computerized baseline database and update the same over time to make the same error-free and up to date.*

2. Make the delivery mechanism more effective through:

- improve financial viability of FPSs – each state must draw up a plan to make them viable,*
- fix a margin that improves the financial viability,*
- PRIs must be empowered to inspect accounts/ transaction records of FPSs – their findings must be regularly discussed in the Gram Sabha,*
- authenticate delivery of grain by PRI members,*
- allow consumers to draw quota in weekly instalments.*
- allow BPL families to lift additional quota at rates for APL families,*
- reduce the price for APL families by the holding cost of grain so as to increase upliftment,*
- ensure that entitlement to food grain is not lower than that stipulated by GOI*

A rudimentary assessment of costs shows that the additional cost of implementing the system would be about Rs. 400 crore per annum and that will yield a savings of Rs. 4197 crore annually.

It is quite clear from the above observations and recommendations that the current method of operation of TDPS has failed to achieve the objectives with which the method was introduced in 1997 – namely, to improve targeting of subsidy and to reduce the burden of subsidy on the government (if poverty is indeed declining) over time. The recommendations suggested by the committee suffer from the same deficiencies that plague the process now. Therefore, an out-of-the-box thinking is required to check diversions and leakages. The method being suggested for kerosene distribution has two major advantages: a) complete electronic record from the point of transaction would ensure that there is an audit trail of all transactions, b) creation and updating with every transaction of computerized database for verification, analysis and course correction if required, c) freedom to the BPL families to allocate resource to their preferred items for consumption (in case cash is paid out to them and not coupon for uplifting kerosene), d) financial viability of all the players involved in the process chain for disbursement of subsidy, and e) complete record of utilization of subsidy.

The issue of better identification of BPL families remains. A combination of criteria may be adopted to ensure better targeting. It would be useful if the amount of subsidy is based on the number of criteria on which a family qualifies for inclusion. The issuance of a machine readable card would improve tracking and sample check of remove errors of classification over a period of time.

Chapter 5

The Problem and the Changes Required

The current system of kerosene allocation, distribution and subsidisation, as argued so far, has several short-comings. On the allocation side, the states are always likely to ask for higher and higher allocation as they do not bear the cost of higher subsidies arising from higher allocations. The distribution system for kerosene within a state would also create pressure for higher allocations in the presence of possibility of diversion of kerosene at a higher price than the price fixed for the retail end consumers through fair-price shops. In fact, in the presence of diversion, even the end consumers would also demand higher quantity to be allocated as that is likely to increase the quantity available to them despite diversion.

The distribution system for kerosene, at least at the retail level is questionably unviable without the possibility of diversion and higher prices realised thereby. It is just as possible that a large number of retail outlets are unviable for other petroleum products (diesel, petrol) unless adulteration or selling short quantities is used to enhance margins and profits! The possibility of such adulteration itself is likely to have attracted rent seekers with political clout over a period of time. The amount of price difference between kerosene and other fuels leaves large rents for the distribution chain. It also forces or distorts choices made by the society in the form of use of adulterated fuel leading to wasteful and incomplete burning of fuel, pollution and shortened engine lives as the cost of such inefficiencies are externalised - to be borne by the larger society.

The administrative machinery to check diversion and to ensure adequately supply of kerosene, in the form of civil supplies departments, is unlikely to be effective in preventing diversion of kerosene and in ensuring that it reaches poor for whom it is meant. This is because (a) the manual accounting and book-keeping system is too difficult to exercise any kind of effective control, and (b) the associated rents from diversions are likely to corrupt the administrative machinery itself. The antiquated system of record keeping also makes it virtually impossible for any independent

checking of the releases by an outsider. Since the accounting is not real time and also because the accounts are decentralized, it is easy to manipulate figures ex-post so as to reconcile the figures for the entire distribution chain. The consumer groups are also likely to be less effective in controlling diversions in absence of adequate, reliable and quick retrieval of information. At suitable level of aggregation, diversions can be easily hidden behind aggregate statistics. (c) Above all, the core problem from which all the problems emanate is the price “arbitrage” opportunity. Thus attempts to put better systems while keeping the overall price “arbitrage” open would only result in higher administrative costs and ritualisation of monitoring systems.

In short, the key attributes and issues in the current arrangement for allocation, distribution and subsidisation of kerosene can be summarized as follows:

- (a) Universal price-based subsidy causes severe distortions and social waste
- (b) Lack of centralised information and controls to monitor releases and sale of kerosene permits fudging of accounts
- (c) Strong incentives for diversion of kerosene for alternative uses and for sale through black market
- (d) Likely denial of kerosene to the poorer end consumers through diversion as their bargaining power is extremely weak
- (e) Excess demand of kerosene created by the possibility of diversion and unfulfilled demand of targeted consumers

Some Desired Elements of an Alternate System

Any changes proposed in the current system need to deal with the short-comings described above. The system instituted in lieu of existing system should be such that the subsidy, if decided by the Government, reaches targeted consumer groups rather than the unintended beneficiaries. It should support capture of information on the allocation and release of kerosene at FPS shop on real time basis and through periodic reporting so that the information can be easily monitored by the end consumers, consumer groups and can not be easily manipulated later to reconcile the data at each

level of distribution chain. Any changes in the existing system needs to also weaken the incentive for diversion and should increase the bargaining power of the entities down the distribution chain. In other words, it should lead to empowerment and consumers at the expense of wholesales and civil supplies department, who currently enjoy maximum power in the system. For this to happen the consumer choices need to be widened and the retailer's business has to be viable.

The incentives for diversion can be easily removed by making kerosene subsidy direct instead of being price-based subsidy. In case the subsidy is restricted to target consumer groups but remains price-based, it is likely to end up in denial of kerosene to the targeted consumer groups given their weak bargaining and political power.

Thus as long as kerosene is sold at a low price universally or to the target consumer groups, it would be difficult to prevent diversion of kerosene. The only way to eliminate such distortions would be to provide subsidy directly through cash equivalents to the end consumers. If need be, this can be done for all ration card holders drawing kerosene irrespective of their income levels. This would substantially reduce the effective demand for kerosene and consequently increase the revenue for the government through higher demand of competing fuels such as diesel.

Improving the economics of distribution would require ensuring adequate margins for the retailers. This would increase the end consumer price as well. An alternative, which is consistent with direct subsidy to the consumers, is to let the kerosene be sold on a commercial basis just as any other product. The effective end consumer price would be less by the amount directly received as cash. The retailer margin for those FPS shops in villages and remote areas, where kerosene may not attract commercially oriented shop keepers may be kept higher.

The identification of the target segment in a country like India always poses major difficulties. This has often been cited as the reason for continuation of price-based subsidies. While the problem is difficult since any identification exercise always has errors of omissions and misclassifications, it is not a valid reason to insist on price-based subsidisation. Even if all ration holders are given cash equivalent of existing

subsidy, socially it would be much better compared to the current method as it would reduce incentives for adulteration. Moreover, identification itself can be improved if the process followed takes into account inputs from institutions other than the official administrative set-up. Similarly, making the identification outcomes / results transparent can elicit response from the public rather than being based on discretion of the officials involved in identification exercise. This can improve the accuracy of identification.

The last and extremely crucial element in any new system has to be centralized information and control system, which can support the required monitoring and control on subsidy so that the subsidy flows to the intended groups rather than siphoned by vested interest. This is possible today through use of information and communication technologies to capture information at the point of transaction as and when a transaction occurs. In addition to such a system, the system should empower the beneficiaries to monitor their payments and receipts as per their entitlements.

Possible Solutions

In line with the above discussion, the possible solutions and policy choices to address some of the problems of the current system are as under:

1. Universal direct subsidy
2. Targeted direct subsidy
3. Improved monitoring and control through use of IT and communication technologies to check diversions within the current system.

The first two essentially are similar except for their impact on the amount of subsidy to be given by the Government. The first one would increase the subsidy and would also require larger system for subsidy administration and monitoring in view of larger number of beneficiaries. The second one would require systems support only for those who are identified as the target group for the subsidy. The second one would also face issues related to identification and costs associated with it whereas the first one would

not. Both first and second options are compatible with market-based distribution of kerosene wherein the beneficiaries receive cash to subsidise the cost of kerosene.

There would be no need for specialized infrastructure for marketing and distribution of kerosene. The allocation process and the FPS's can be generally eliminated except may be in remote areas and villages.

The third option can be viewed as strengthening the monitoring and control system to allow for real time centralized tracking of the entire distribution system mapped through a state-wide centralized data base and information system linked with the entire distribution chain. While this solution may improve allocations and possibility of detecting leakages, the price differential between open market competing fuels and subsidised kerosene prices would still leave strong incentives for diversion. Real improvements may also not be realisable as “innovations” in fudging, in ritualisation and in obfuscation would happen with the passage of time. It also would require restricting the sale of subsidised kerosene only through a control system as at present. Given these problems, it is unlikely that such an administrative solution would overcome the ills associated with the current system.

In the light of the above analysis, we would think that targeted direct subsidy administered through a centralised system without the need for any special channels for distribution of kerosene is the most desirable solution.

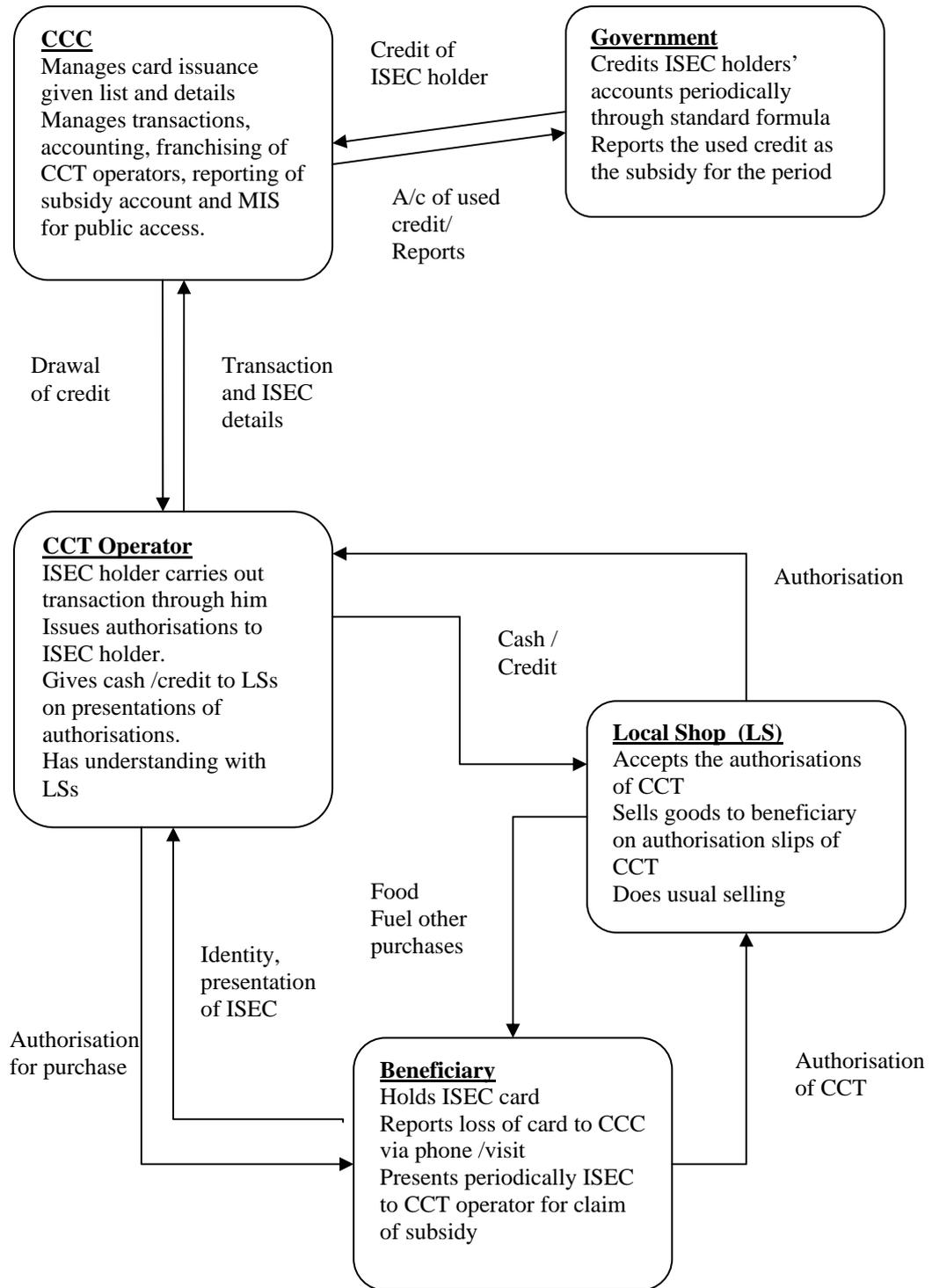
Chapter 6

The Proposed System of Direct Subsidisation

In order to minimise the risks associated with implementation, while the system could be designed for eventual all-India application, a beginning can be made in one state on pilot basis. The proposed system is based on using IT to administer kerosene subsidy (and later possibly other entitlements) through a card based centralized system. The system needs to be capable of recording the transaction details for analysis, monitoring and control. The targeted consumers would receive their entitlements as defined by the subsidy decided by the Government and would be paid as cash/cash equivalent which may be used by them to purchase kerosene from the market.

The cash equivalent would be collected by the system operator, who would in turn get paid by the Government through transfer after scrutiny of the bills raised. The system operator as well as the acceptors of cash equivalent would operate on commercial basis with the Government paying for the cost of operations. As against these incremental costs, the Government stands to gain from savings of costs associated with the current distribution system, increased revenue through higher taxes on account of increase in demand for competing fuels and likely reduction in the subsidy bill on kerosene. These benefits are in addition to elimination of social costs associated with diversion.

Fig 3: Schematic Representation of Subsidy Administration (Option A)



Key Process Elements of the Proposed System

The elements of the proposed system recommended by us to administer targeted direct subsidies are summarised and discussed below (Fig. 3 presents a schematic representation).

- The subsidy is directly given to the target consumer in the form of authorisations/ coupons which the beneficiary can use to buy kerosene /food in the market. This would make his and others' decisions on use of kerosene independent of artificial (subsidised) price.
- The parallel distribution network of the PDS would become redundant as a consequence and could therefore be abolished entirely. Instead, consumers can use local markets to purchase their grains /kerosene, with their authorisations /coupons. This will eliminate entirely the humungous inefficiencies associated with the PDS.
- Consumers are issued Identity cum Subsidy Endowment Cards (ISECs) once. (The next section outlines the details of the scheme for issuance of ISECs). These cards would allow the targeted consumers to claim their subsidy entitlements.
- The ISECs would have validity for five years from the date of issuance. This would mean that the category for a family could change once in five years.
- The data related to all consumers would be available on a centralised database to be maintained by the central card issuer-cum-subsidy administrator.
- The entitlement for each category of consumer would be defined by the government and changed any time through entries and changes in the centralised database.
- The information and issuance system would build almost entirely on the services currently available in the market and being used for commercial purposes such as for credit card operations.

- The cards issued to the customers would be akin to credit cards with the difference that every month the government would credit the amount of subsidy to the customer to the extent of his entitlement. This would be automatically done every month through a programme on the basis of instructions given by the Government.
- The consumer would be allowed to go to any shopkeeper, STD/PCO stall/ Post office or dealer in oil products who has a Credit Card Terminal (CCT) (e.g. Verifone, Hypercom, Ingenico etc) to access and utilize his entitlement as per his convenience with no restriction on the number of times he uses the card.
 - The beneficiary pays the difference between the local price of kerosene /food she desires to purchase and the subsidy entitlement and issues out an authorisation from the CCT operator. The CCT operator connects the instrument with the consumers ISEC and debits her account. The authorisation issued by the CCT operator is in the form of a slip with the transaction number and the amount for purchase authorisation equal to the debited amount on the consumer's subsidy credit created by the government and the amount she pays to the CCT operator. The CCT operator's authorisations are recognised by local kirana shops/ super markets / kerosene /oil dealers (Local Shops or LSs). (Option B)
 - The consumer presents the ISEC, signs/ places thumb impression on transaction slip and gets authorisation to the tune of the entitlement debited by the CCT operator. The CCT operator simultaneously credits his own account via the same transaction. The authorisation of the CCT operator is recognised by local shopkeepers. (Option A).
 - It is assumed that acceptance of authorisation would be in the interest of the shopkeepers and CCT operators. Otherwise, CCT operator itself can give out cash to the consumer. (Option C)
- The consumer with the authorization buys food /kerosene from any of the local shops with whom the CCT operator has an understanding. (Option B). The consumer with the authorisation and additional payment buys food and

fuel from local shops (Option A). Alternatively, the consumer could use cash given by the CCT operator (Option C).

- The local shops collect the authorisations and collect money /credit to their accounts from the CCT operators on a daily or some pre-determined basis from the CCT operators.
- In this system the consumer could use her authorisations in a way so as to buy more food or fuel of her choice. Consumer choice would therefore be fully reflected in the purchase decisions. She could also buy any other commodity, so that the current subsidy on account of food and fuel would become a general consumption subsidy. This would have a far greater 'utility' to the consumers compared to specific commodity linked subsidies currently in vogue.
- The proposed method is perhaps the simplest solution for delivering consumption subsidy that provides the highest possible utility to beneficiary (through preservation of choice) while ensuring delivery of subsidy.
- The value of the ISEC would be net present value of the stream of benefits that the card holder would be entitled to. Therefore the card itself could potentially be tradable if a person other than its holder can use the same. This problem can be greatly reduced by making the card cancellable at any point in time, and the card holder being entitled to a new card at a small cost. Thus even if a money lender or someone else lends to the poor consumer on the basis of his card, he knows that the card holder after giving him the card can legitimately cancel the card. This risk, and the high cost of closely monitoring the consumer and ensuring that she does not do so, would render its value small in relation to the net present value of the stream of entitlements. This means that the card holder's choice would be narrowed down to actually using the card, and not selling or mortgaging the same. At the second level, the use of a ISEC by any other person can be made an offence on the same grounds as in the case of credit cards. Signature/ thumb impression and photograph on the card would provide the necessary safeguards. A second card issued to spouse, while the first card is issued to the head of the family, on the lines of

subsidiary credit cards should be possible, and would provide the required convenience in using the card for purchases of fuel and food widely.

- The business of CCT operation would be automatically viable since in addition to a small transaction fee which the CCT operator would earn he would also enjoy the benefit of the credit arising out the difference between the time his account is credited by the government by debiting the account of the ISEC holder, and the time local shops present his authorisations for cash.
- Larger shops should be allowed to combine the functions of the CCT operator and the local shop. Indeed the need to provide for the separation arises only because not many shopkeepers (especially kirana shops) encourage credit card purchases. Credit card companies usually charge some percentage of sales made through credit cards to small shop keepers and for certain kinds of commodities, which in highly competitive businesses would discourage such sales. The fact that the transactions are recorded by the credit-card issuer also is deterrent.
- CCT operator could ideally combine STD /PCO operations along with CCT operations.
- (Option A). CCT operators could issue authorisation for the value of the entitlement. Such practice would actually be beneficial to the ISEC holder since even without any cash she can get the benefit of her entitlement. Moreover since in Option A, the CCT issues authorisations only to the extent of the subsidy entitlement, he does not have to know the market price of the good in question. Thus the purchase decision and the disbursement of purchasing power is completely separated. It makes the task for all parties much easier. If the government wants to fix the entitlement in quantities it would have to work out the equivalent in money terms on the basis of state level prices and credit the ISEC holder through a standard formula. This may be done once a month. Henceforth Option B would be dropped from further discussions, though the adoption of any of the options would be dictated by the ground realities.
- CCT operations should not be limited in any way. In urban areas and in dense rural areas for very low fee per transaction or even no fees CCT operators are

likely to come forward. In the few remote rural areas, a few CCT operators would have to be encouraged to operate through payment of higher transaction fees. Alternatively, mobile CCT operators could be allowed by the card issuer. Such operators can move across an area for issuing authorisations/ disbursement of cash.

- CCT operations being purely financial intermediaries would have a relatively low cost per rupee of subsidy delivered, in relation to any other system such as monthly issue of coupons by the government or through a system dedicated to the purpose of subsidy. Since the CCT is common to other credit card transactions the investment cost in most cases for the CCT operator is nil, wherever such infrastructure exists.
- Since the proposed system rides on existing transfer of information and credit facility, its social cost is relatively very small.
- With 200 million families, out of which about 30-40 million families are likely to be poor and therefore beneficiaries of entitlements from the state, the business of CCT and credit cards in general would receive a boost. It would also have positive spillover effects, especially if for all subsidies for the target groups the same method is adopted. Thus fertilisers, LPG, electricity, small pensions and other income transfers, besides food and kerosene could be disbursed on the same principle. Indeed, it can be designed with enough fields of information such that it can become an acceptable identification vehicle in the long run.
- Leading credit card companies (CCCs) or transaction processing companies with expertise in use of IT and/or managing field staff, would have to be invited to take up the business by bidding on the required transaction fee per transaction and per crore of rupees delivered as subsidy. Theoretically, even negative bids are possible if the company estimates a significant time lag between the date of creation of credit in the accounts of ISEC holders and the drawal of the same.
- The CCC that is authorised to operate is the only entity that seemingly has the potential to generate fictitious transactions to claim the subsidy transferred to the ISEC holders even when they would not have claimed /collected the same.

The danger of this is small due to the large pull of the consumer to claim the subsidy. Unlike in the present system where accountability is intrinsically not possible. The gains are small for the consumer and his own effort in claiming is very large. While in the proposed method since the net benefits after subtracting the value of his costs of claiming are very large, the chance of under use or non-use by genuine ISEC holders is almost nil.

- Safeguards can be built into the operations of the CCCs by insisting that only CCT operations with firm transaction number, transaction date, and CCT operator stamp are valid. Moreover consistency between ISEC data and CCT operator data in terms of location can also be insisted upon. Ideally any ISEC holder should have the choice of at least three CCT operators, and it is better not to limit the choices of ISEC holders to particular CCTs. In any case, intelligent data mining would most certainly reveal any fraudulent transactions. Given that audit trail of all transactions would be available would itself be a big deterrent .
- To improve the security the underlying phone transactions can be cross checked for genuineness and matched with CCT transactions.

A comparison of likely fiscal impact of the proposal as compared to the current system has been made in Table 11. The changes proposed would entail one time cost of rolling out new system including issue of cards. However, as can be seen, the benefits outweigh the costs and the fiscal impact is hugely beneficial (approx. Rs. 14,900 crore annually). The additional social benefits not captured in the analysis include: pollution reduction, elimination of rent seeking and directly unproductive activities, optimal decision processes in the oil companies, removal of subsidy burden of the oil sector, avoidance of improper choice of fuels, erosion of the political basis for dealership, significant increase in the actual benefit delivered to the target group while retaining consumer choice, and significant impact on poverty reduction.

The effective income gain per BPL household with the current “Targeted” PDS (TPDS) is Rs. 506 annually (approx.) [Based on Planning Commission, 2005]. Leakages outside the BPL are nearly 60% of the food released. Therefore with correct

direct subsidies at least Rs. 1250 could be added to every BPL family. On account of kerosene at least Rs. 4800 per family can be added to consumer expenditure.

Accounting for higher cost avoidance by removing the PDS and allowing consumers to buy in the market both grain and kerosene, the total gain per consumer on direct food and kerosene is of the order of Rs. 7000 per annum. This amounts to addition of Rs. 116 to monthly per capita income in current (2003-04) price terms which is more than 20% of the monthly per capita consumption expenditure (all items) of farmer households in rural areas of Rs. 503 per head per month [NSS 2003-04]. It would be about 45% of their food and fuel expenditure of Rs. 230 per month.

Chapter 7

Identification and Issuance of Smart Cards

The process of identification of the beneficiary and the issuance of smart cards with detailed information including number of family members, address, economic categorisation would remain the government's responsibility. Although for transparency, accountability, quality and low cost the government could get the same done through vendors through a tightly specified agreement. In this chapter, we bring out the key aspect of the processes that are involved in identification of category to which a consumer belongs and issuance of smart cards for the targeted beneficiaries.

The criteria for identification have to be simple and yet not easily amenable to fudging. It has to be an exercise that is carried out once with great care, since mistakes would lead to misdirection of benefits that would be difficult to correct. The errors of omission and commission in the proposed system can only be no worse than the current use of printed cards, where the identification process has essentially been top down. The point to recognise is that even if there are errors in identification, the proposed process of separating subsidisation from prices prevents all the distortions.

Furthermore, by unbundling the identification from the issuance, making the former an exercise that is carried out infrequently, and the latter a routine card based transaction the identification exercise can be focussed upon and carried out carefully. It is also thereby possible to improve the process of identification substantially, especially by making the process itself "incentive compatible", and by using local information.

The entirety of the scheme for identification should be publicised and made clear to the population at large through various channels including extensive use of television. A manual on the process of identification covering the philosophy and the details would have to be made widely available to all concerned including citizens groups and local bodies. Field studies must be carried out for collecting data on possible misidentification, for use by the state level officials. The manual must get into the

details of the roles of the various actors in the process of identification (government at various levels, oil companies, PRIs and local bodies, NGOs, Vendors of various kinds, Credit Card Company, civil supplies officials, Specific departments of the government).

BPL, when based on calorific intake of food, is not a category that can be operationalised easily since it is transcendental in character with the surveyor having to know not only the overall consumption expenditure but also the components of the same and the calorific content of all food stuffs.

It is much better to rely on the NSS consumer expenditure figures to arrive at the number of people whose expenditure on food is below a certain level in real terms (adjusting the money value of expenditures with the local price index for food). An extended NSS with a much larger sample should be able to assess the number of such people taluka wise separated into rural and urban areas. The level so chosen should be such as to give at the national level no higher than 20% of people. This would mean that in poorer talukas, the number of persons below that level of real expenditure would be much more than 20% and in others much less. For determining the proportion at taluka level, similar studies can be used. This should constitute the ceiling on the total number of people to be covered taluka wise.

The centre should not allow more than a 5% change in the absolute numbers of the persons in each taluka to be covered when it backs up its estimate with a sample survey as outlined above.

But such an exercise need not wait for a more extended NSS. Even the existing NSS consumer expenditure surveys can be used to arrive at district level estimates of the number of persons below a certain level of consumer expenditure fixed in real terms when the current expenditures are adjusted by the variation in local food price indices. This can be carried out by using the local CPI for manual workers / agricultural workers to adjust the cut off level of consumer expenditure at the district level. Particular centres for which the CPI is available could be used to cover more than one

district. Further allocation of the number so arrived at for each district to the taluka level can be left to the state government.

The taluka wise total numbers of people that would be covered should be broken up further to each village and ward of urban areas based on their population and local information available on the relative status of incomes of villages and wards. This can be done by the district administration in collaboration with zilla parishad elected officials. The key here is that the bureaucracy at the district and taluka levels using all information at its command can generate the numbers of poor at the taluka, and village levels (town and ward levels).

The numbers at the taluka level can be presented to the zilla (district) panchayat who can fine-tune the distribution. They can bring in local information on the concentration of the poor etc in particular talukas and villages to make these adjustments. The point that they would have to recognise is that the increase in the assessment of the number of poor in a particular taluka would have to necessarily mean reduction in some other talukas elsewhere in the district. This would make the elected representatives recognise the compositional aspect of their decisions. In any case no more than say 10% change from the figures estimated by the district bureaucracy should be allowed. The district bureaucracy could of course choose to employ consultants to arrive at the initial assessment taluka wise. The same procedure can be extended to decide the numbers of poor village wise. This can be done at the block / mandal /parishad level where all villages are represented. In some states where the geographical consistency is not maintained, the process would have to recognise the same.

Thus, for Gujarat, there are 25 districts, 224 blocks or talukas so that on an average the quota for each district has to be allocated among 10 blocks at the zilla parishad level. Similarly, there are a total of 13711 panchayats covering 18859 villages since some panchayats represent more than one village and some villages do not have their panchayats (Table 8).

This means that each block on the average has 84 to 85 villages so that the quota for each village has to be allocated at the block level among the constituent villages. This is best done by the village pradhans themselves meeting at the block level and dividing the quota on the basis of the population of their villages and the data on consumer expenditures at the village level / their own assessment of the numbers of poor.

Caste groupings are important in village elections and in decision making at the block and village levels. It is important that all panchayat members and local political leaders are made aware of the scheme of identification, the information basis, and the criteria for the same and their own roles in the allocation of quota down to the village level. On an average this would result in about 350 Smart Cards being made per village of which about 70 are likely to be cards with entitlements. It is better to issue cards to all families and to specify the entitlements on each card with those without entitlements from the state being specified nil entitlements.

Once the number of persons to be covered in each village is fixed through the process above, then a village database involving many of the aspects of governance besides known socio-economic profile of the families can be developed as follows:

Each family has to apply for the Smart Card in a format that is specified as below:

- 1) Name of Head of Household
- 2) Names of other members of the family and their ages
 - a. Occupation /Employment status of each member of the household and
 - b. Income of each member even if self employed.
 - c. Identification marks of head and spouse
- 3) Residence address of the household
- 4) Phone number/s if any
- 5) Total income from all sources
 - a. Agricultural income
 - b. Wage income as labourer
 - c. Other income as self employed

- d. Other income
- 6) Self classification of income category
- a. Poor
 - b. Lower middle class
 - c. Middle class
 - d. Other
- 7) If claiming food subsidy as poor
- 8) If claiming fuel subsidy as poor
- 9) If not claiming any subsidy then the details required in items 10 and 11 are not necessary to provide
- 10) Immovable assets possessed:
- a. No of two wheelers including registration no
 - b. No of other motor vehicles including registration no
 - c. Land possessed including survey numbers and location of land
 - d. House/s possessed including address and registration numbers
 - e. Bank accounts including account numbers
 - f. Gold and other financial assets (NSC, NSS, PF etc)
- 11) Existing Ration card if any and the details therein
- a. Names covered and their date of birth
 - b. Entitlements of food
 - c. Entitlements of kerosene
 - d. Other details such as place of issue, card no, etc
- 12) Existing Passport details of the members of the family included
- a. Name/s
 - b. Passport nos.
 - c. Date and place of issue
 - d. Address in passport
 - e. Countries visited
- 13) Other indicators of consumption expenditure /status
- a. School fees paid for all dependents
 - b. No of college goers
 - c. Household gadgets: Refrigerator; Sofa set etc

- d. Electricity Bill for household
 - e. Electricity bill for IP set is operated
 - f. Telephone bill over the last month
 - g. Kilos of grain /pulse/ bread and related food consumed
 - h. Monthly expenditure on meat, eggs, and milk and milk products
- 14) Case status of head of household
- 15) Caste status of spouse if different from that of head of household
- 16) Names and addresses of three persons who can identify and vouch for the veracity of information provided

List of households in each village and names of members have to be prepared with the household being defined as a common kitchen. Thus HUFs / other joint families having different kitchens could be considered as different households. The land records should be matched to families and the ownership of land family wise can be generated. Only such lands as they belong to persons outside the village /block can be left out in the initial list.

The list would also have the following:

- Current status in terms of ration card, and if so the category of the card
- Address of household with clear specification of survey no of house /plot, village, mandal or block and district.
- Other information such as telephone no, other immovable assets possessed such as houses and recorded assets as per government records. (Motor vehicles and house registration, house tax, establishment record, driver's license) All these government agencies record the address of the owner and when a proprietor or partnership the address of the principal partner can be used to develop village wise /urban ward wise lists of shops establishments, telephone connections, motor vehicles, and houses.).

Such lists can be fed to the village panchayat who then have the task of relating these lists to families in the village. This aspect while desirable is not essential. The

electoral roll of the village is the core first list to which the social, economic and administrative data are appended.

The PRI or a survey subcommittee (adequately represented by all caste and religious groups) of the same gathers additional information of assets possessed, income of households, age, educational qualifications of each member, caste status (SCST, Backward, other) if this is not already known and an integrated list of all households ranked from the poorest to the wealthiest is developed. The bottom so many families to make up as many individuals as in the quota for the village, rounded off to the nearest full family are listed as “Poor” or deserving of consumption expenditure subsidy.

This integrated list (with other information generated above) of about 500 households is printed in large print and displayed on the village office notice boards and in prominent places by the PRI.

People are invited to submit their objections to the list including information on why they should be listed poorer than another family. Similarly families are invited to state through anonymous notes which of their neighbouring families are just above and below, and also identify another family equal to them, in income status. This has to be done in a closed ballot like process under the supervision of a government /public sector official, randomly selected for such duty, in a manner akin to the election duty.

Each family validly on the rolls is given a unique temporary identifier which is the serial number of listing in the first list. Such submissions can be consistently put together, and the list modified to give rise to a revised ordered list. After some iterations the final ordered list from the gram panchayat is accepted by the Collector.

The Collector invites one round of submissions from families not identified as poor. This is allowed to all identified BPL card holders who are not included in the list of poor. The collector sets up an agency or empowers groups consisting of NGO's, school teachers and lower officials one to each block or taluka, to verify the veracity

of these cases, and allows only those cases which are genuine to be included in the list of the poor.

Collectors are additionally allowed to include migrant poor people who may lack a permanent residence address and their inclusions cannot be more than a certain 10% of the total quota of the poor in their district. They have to satisfy their commissioners / seniors of the basis of their inclusions, as also the numbers.

An empowered vigilance committee needs to be set up to receive possible accounts of malpractices, and when cases are proven large awards can be made to those providing the information and the proof. A proportional award can be made to the officials of vigilance making the investigations. Such vigilance committees are set up by the state level vigilance at each district. For every 1 misclassifications (of non-poor being classified as “poor”) so corrected the amount should be in the range of a thousand rupees so that there is sufficient incentive to correct mass misclassification.

The final list is put at the village level and any further complaints are entertained by local courts with a process that reimburses all court fees in case the representation is proven correct. Courts have to take due cognisance of the basis for inclusion and rank ordering, and the prior information provided.

The same list is also sent to the Credit Card Company (CCC) selected for the purpose, who then makes the card by visiting each village and photographing up to two members typically the head of the household and the spouse, and matching the same to the application form, and to any prior ration card that had been issued. The CCC through agencies with the photograph and verified information prepares the Smart cards which are mailed to the cardholder with a key.

The Information the Smart Card Contains:

Names, age and sex and such details as Identification marks of head and spouse, finger prints, photo of head and of spouse, assets possessed, land holding, occupation

of all members, telephone numbers (if any), address in detail, estimated income category including BPL etc, date of entry, of verification, issuance and place of issue. In addition the card would contain spaces for defining the entitlements of all subsidies:

Kerosene

LPG

Food

And space for defining the entitlements for other subsidies in the future as the administration of these subsidies are reformed and made direct:

Electricity

Irrigation water

Fertiliser

Old Age and other Pensions

Subsidies under other possible schemes of the government

A unique identification number which is the base number for the accounts of the consumer on various subsidies.

Chapter 8

Implementation of the Proposed System

The Institutional Framework

In case it is decided to go ahead with implementation of direct subsidy of kerosene, the Ministry of Finance and the Ministry of Petroleum and Natural Gas may begin by setting up a task force (TF) to implement the suggested system. Other departments/ Ministries could join in the implementation as the benefits from direct subsidization as against universal price based subsidies are realized and other subsidies too are provided using the suggested mechanisms.

The TF would consist of persons with diverse expertise and experience including , public management, IT, law and general management. The chairperson of the TF would have the status of cabinet secretary and would have a tenure of 5 years and his independence would be ensured by the government through suitable enactments. The major task of the TF would be to set up an SPV (Special Purpose Vehicle) for the administration of direct subsidies. The budget of the SPV for the subsidy alone, routed through the TF, would be a part of the budget of the Finance Ministry. The performance of the SPV would be judged on the basis of the total cost - direct and social- incurred in transferring a rupee of benefit to those intended and reduction in the distortions and perversities that it is able to bring about in the administration of subsidies over the current situation. In addition to general administrative experience, the skills required for operating the SPV effectively would include accounting, finance and design of bidding systems for developing RFQs/RFPs for dealing with vendors.

The TF needs to be adequately empowered either through a legislative or an executive action. It should have its own team for implementation. The size of staff needed for implementation may not be more than 20. The TF would have a line of credit from the government of India annually for the estimated level of subsidy (depending on the number of beneficiaries and the quantum of entitlements) on account of kerosene. It

would have additional amount of credit if subsidies on food, electricity, etc. are also delivered through direct subsidy mode.

The TF would have the responsibility of :

- (1) Designing and ensuring suitable direct subsidy mechanisms that have the least possible distortions; insulating and disengaging the productive and supply organisations from the mechanism, so that the productive and supply organisations are entirely free to manage their businesses commercially.
- (2) Ensuring correct identification of the beneficiaries, and delivery of benefits to the intended beneficiaries; handling complaints from consumers and citizens, NGOs and other public bodies including politicians.
- (3) Preparing answers to questions raised in the parliament on administration of the direct subsidy system.
- (4) Ensuring that the SPV makes available all information to help the concerned citizen assess the performance of the SPV. Only such information as is required to be kept confidential for instance finance bids of vendors that take up the SPV and the associated terms etc would not be so available.

The TF would also have the following elements of authority, which it could delegate to the SPV for subsidy administration:

- (1) While the criteria for identifying the beneficiaries would be decided in mutual consultation with the appropriate ministry/ ministries, the TF would have the final say in the matter, keeping in view the feasibility, functionality, fairness and its external effects of the criteria.
- (2) The TF and on its behalf the SPV would have the authority to call upon all ministries and departments of the government of India and its parastatals, the state governments and their parastatals and all other public and private

bodies (in public management) for data with regard to consumers, their asset base, their incomes, their consumption, electoral lists, census information, other indicators of economic status and such other information that the SPV may require for effective functioning.

- (3) It would be able to enter into contracts for services and supplies with vendors with the understanding that its liabilities would be that of the government of India.

The Procurement Process for Subsidy Administration

The TF would carry initiate the process of direct subsidisation in the following manner:

The separate tasks of (1) identification and (2) Delivery mechanism as differentiated in this report, would be carried out either separately by two different vendors or together by one vendor depending upon whether the identification process is carried out involving local politicians or otherwise. In case local politicians –elected PRI members, MLAs and national parties are involved, it is important to separate the two processes. In case only the PRIs (as bodies) are to be involved and politicians (PRI members, MLAs and national parties) are not involved then it is necessary that the tasks of (1) identification and (2) delivery mechanism while distinct and specified as such are carried out through the same vendor.

It would be possible to have different vendors geographically but it would be desirable that only one or at best two vendors are selected across the country to ensure that there is uniformity of design and practice. The details of the entitlement, as also the channels to be used for distribution of entitlements could differ across regions, depending upon the local conditions. Additional reasons for restricting the number of vendors are to ensure accountability, national level recognition, ease of public and media monitoring of the activities and performance of the vendors, besides ensuring sufficiently large economies of scale and scope.

The vendors business for subsidy administration whether for identification and for issuance or for both needs to be necessarily separated from other businesses, with its own special formats for reporting to the SPV created for subsidy administration. The SPV would initiate the process by inviting EOI from potential vendors. The criteria for qualification of vendors would be sufficient net worth (of the order of a Rs. 100 crore) for the participants, and strong prior reputation in managing businesses involving large numbers of people and with adequate IT experience.

It is expected that the EOI may attract credit card companies, banks with sufficient large ATM networks, leading IT companies in India, companies in FMCG marketing with a rural reach etc. The document inviting EOI would outline the basic approach of identification as in this report, the system for issuance of subsidy as in this report, the aims and objectives of the task, the problems encountered in the current price based mode of subsidisation and need for non-distortionary direct consumer / producer (as in the case of farmers) subsidies to be instituted in their place. It would also provide data on the number of estimated ISECs to be issued, the volume of subsidy to be delivered in money and quantity terms, the transactions that are likely, the mode of monitoring and the databases that the vendor would have to develop and maintain on behalf of the government and the TF. The benefits to the vendor besides directly through the activity of issuance of subsidy would be indirectly through the enhancement and extension of the credit card /CCT business and through the businesses of telephone calls/ data transfer. This aspect has to be made clear in the invitation for the EOI itself.

Once the potential vendors are identified, the TF would meet them and clarify the aims and objectives of the proposed direct subsidy scheme, the nature and design of the scheme, the roles and responsibilities of the TF/Government, the selected vendor (SPV) and the legal and administrative framework for the same. This exercise would have to be inter-alia directed at identifying the risks that the vendor (SPV) would face and the TF/Government is likely to face with regard to direction and cost of subsidy. The consultants to the TF would assist in this exercise to ensure that there is no mistranslation in the communication of the proposed scheme. The RFP document

would be prepared based on the clarity that emerges through this processes and then proposals from potential vendors would be invited.

Since the proposed system is for very large number of people care in the design is of vital importance. The importance of coherence of design and ensuring incentive compatibility of the process cannot be over-emphasized. Since the RFP is for procurement of a service that has many complex interlinked elements including an aspect of governance, and is for the first time by the government of India, due care and diligence in design with efforts to anticipate the implementation details would be called for. Hence invitation of objections or suggestions to the scheme from the public and NGOs would be useful. It may also be useful, at the appropriate time -once the core details of the scheme are firmed up – for TF to announce the details of the scheme as well as the vendor selected for implementation publicly.

The bid for the identification exercise leading up to issuance of cards needs to be separated from the management of disbursement of subsidy once the new system is in operation. The fee per person for the identification exercise and issuance of cards could be either a positive or negative depending on how the credit is operationalized. If the credit from the government is directly to the account of the beneficiary then a small positive bid (the government having to pay the vendor) is likely. The evaluation process of the bids must pay specific attention to the method proposed by the vendor to ensure transparency as well as increasing accuracy through continual updating of records proposed by the vendor. The evaluation should also pay attention to the extent of the responsibilities of the TF/Government that the vendor proposes to shoulder.

The weight of the technical part of the bid should be considerable. Indeed it may perhaps be better to have the cost of identification and issuance per person fixed upfront based on a cost study of the activities as outlined in this report, and once it is accepted by the agencies that have expressed an interest in implementing the system, the bids are evaluated purely on basis of technical aspects of implementation - implementation capability, knowledge and experience in information and

communication technologies, design and management of databases, and other similar features as discussed earlier.

Required Safeguards

The actual implementation of the scheme both identification and issuance system has to be outsourced to a commercial party (vendor) with much reputation and success in other fields such as in IT, banking, retailing etc. This separation would make possible and allow the government to hold the agency to its contract and therefore responsible. A government agency is less likely to be held responsible. Most certainly there is little basis for the TF to hold any internal agency /department etc responsible. Thus the actual implementation would have to be outside any ministry including the Department of Civil Supplies, though the senior officials of the Department of Civil Supplies and the Ministry of Petroleum would have to drive the TF.

Although no contract can be complete it is desirable that as much of the task ahead and the contingencies, including the risks, the responsibilities and deliverables of various agencies including departments of the government, the vendor/SPV and all others involved are anticipated and recognised for their influence, interaction and determination of costs and of success.

A pilot scheme is important since many details can only be encountered at the ground level and the pilot would allow the learning to be incorporated into the final design of the scheme and of its possible variants.

The identification can best be carried out with ample publicity and coverage of the scheme in the media and elsewhere at the correct time. [Which would be once the scheme in its details is agreed to be the vendor/SPV and the SPV is ready to start the implementation at either the pilot or national level]. This would bring all relevant information including micro level private information to positively impact the identification exercise.

It is important that the ceiling on the number of poor is imposed from above by the TF and not much leeway is allowed to the district authorities. And even when this is done the enhancement in a particular area has to come from the decline in numbers elsewhere in the district/ taluka, so that the incentive power of “fixed sum game” to bring forth private information is taken advantage of.

The criticality of the proposed detailed survey of consumers to arrive at the taluka/ block wise estimates of the number of people below the poverty line is important. To make the matter simple we have proposed a shift in the calorific intake to the total monthly consumer expenditure amount (below which) to identify BPL families. It is important that this survey is done to ensure that the significance of the estimates is at a one per cent level. This would mean different proportions of sampling in different areas depending upon the variability. The current NSS surveys can be used to up the number to be sampled and to reduce it elsewhere where either the variability is low or the consumer expenditures way above the poverty line level. It is important that since decisions are to be based on the survey this is carried out with due care. The involvement of outside consultants with the CSO’s NSS could enhance the reliability of the results. All such data should be available for scrutiny. Dual samples may also be called for.

Phasing Implementation Plan and Managing Transition

Phasing of the implementation of the scheme is of crucial importance. Ensuring correct identification is of crucial importance to the state not only in the issuance of kerosene subsidies but in the issuance of food and other subsidies like fertiliser and electricity. While the latter two are not entirely poor in their orientation the element of ‘income of the farmer’ is important, and production subsidies have been politically sold on account of the ‘poor’ aspect. Food and kerosene subsidies even in the current framework are on account of the poor. Since in the latter two the aspect of poverty and income of the recipient is likely to be important, though not overriding it makes sense to get to the correct identification of the poor although this is not critical to the success of ‘direct’ non-price based subsidisation. Even with misidentification the

savings on account of moving to direct subsidies in kerosene is very large, and must be pursued. So even if the starting point are the current BPL lists available with the state governments, it is important to have processes of weeding out of cards in place through continued use of private information and the competition in fixed sum games. This approach is less desirable than the first one of doing a good job of identification since its use for directing food subsidies and for poverty alleviation is considerable. Thus direct subsidies which can be delivered with accuracy and low cost, can overcome the problem of poverty in India; while actually saving on current expenditures. Therefore much is at stake.

The enormous potential of direct subsidies should not be whittled away in a poorly designed and implemented scheme. Given the potential it is important to get the scheme right first and therefore the importance of the pilot scheme.

Estimated Costs and Time-frame

Table 11 presents the estimates of the costs likely to incurred in instituting a direct subsidy scheme, and the fiscal savings on account of direct subsidies. It is important to realise the current fiscal cost on account of low price of kerosene excludes revenue that could have been made had kerosene been taxed on the same level as diesel. In relation to this the current fiscal cost of subsidisation of kerosene is Rs. 24,500 crore approximately assuming that the subsidy per litre of kerosene is approx Rs. 20 in relation to the price of diesel, rather than the reported subsidy of the order Rs 4500 crore reported by the government (2004-05, Infraline, 2005). The current cost of delivering one rupee of benefit is Rs. 3.40 in the case of kerosene. Through the proposed system it can be reduced to Rs. 1.05, without accounting for the vast gains through reduction in perversities and distortions.

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The annual fiscal savings are of the order of Rs. 14,900 crore. This is very large for any state to be unconcerned with. Therefore the shift from price based subsidies to direct subsidies in kerosene which can realise these gains and in other areas food and electricity is very urgent. Otherwise the high growth potential of the economy would be nullified by the unsustainability of the current price based subsidies.

The pilot scheme it is expected should take a year or so if it is developed at the level of a state to begin to be implemented. After six months of operation of the pilot scheme it is possible to start the process for the RFQ/RFP for the nation wide scheme. This of course presumes major administrative and political commitment and the suitable empowerment of the TF.

Chapter 9

Estimate Of Future Savings Possible In Shift To Direct Subsidies

The implications of the current mode of subsidisation in the future are difficult to foresee accurately especially in all its perversities and ramifications. While adulteration, diversion and revenue losses are likely to continue they are likely to grow at least in proportion to kerosene demand. Two contrary influences on the genuine demand for kerosene by households may be recognised. As a product inferior to LPG its demand is likely to decline sharply as LPG grows. Similarly the lighting demand for kerosene is inferior to the use of electricity. Unfortunately the horrendously unreliable supply in much of the country and nearly all of rural India makes it impossible for most households to not depend upon kerosene. Battery back up and generators (using kerosene) are options for the well to do or by commercial establishments. LPG has grown at rates close to 11% per annum over the last decade.

In contrast as incomes rise there arises a critical level beyond which the use of LSOs is shunned, and in that sense kerosene is superior to LSOs. But if the experience of Kerala is any example then the continued use of LSOs especially (coconut tree wastes) and in Punjab of agricultural residues, LSOs are likely to be in use. Unless the bottom 20% of the population's income rise beyond that point when collection of LSOs is not economical the use of LSOs in rural areas is likely to continue. This is not expected over the next five years. But urbanisation brings about a sudden demand for commercial fuels of all but the poorest households and therefore the trends in urbanisation would drive the real household demand for kerosene in its aspect of replacing LSOs. On the whole the inferior aspect of kerosene and should have dominated, so that kerosene sales should have fallen as the LPG penetration took place. Unfortunately given the perversities the actual kerosene sales is a total demand that represents both household demand other demands and demand arising out of diversion. Since the latter depends upon the "excess" supplies made available through the PDS what goes as kerosene sales are really the amounts of kerosene made

available under the PDS. The non-PDS use of kerosene is very small, most such users having already resorted to purchases in the unofficial market supplied through diversion and decoloring of PDS kerosene.

Therefore estimating the future demand for kerosene is fraught with difficulties since regime shifts to interalia overcome the distortions are likely or cannot be ruled out, and as part of this exercise relative price changes are likely which could drive the demand for particular products differentially from that of oil products as such. In any case since what we have the release of kerosene under the PDS masquerading as sales we are forced to use the same. We have attempted to forecast the demand for kerosene in a do nothing scenario over for 2010-11 assuming a growth in real GDP of 6.5% per annum and a population growth rate of 1.8% per annum.

We first estimated a model for all petroleum product sales, which is reported in table 12. Using 23 points of data the relevant dependencies were on population, real GDP per capita, relative price of oil vis-à-vis all commodities, and the share of services, and the share of electricity gas and water, to proxy other impacts such as those arising out of urbanisation and other structural in the economy. A good fit is obtained. Using the estimated coefficients as reported in table 12 and the assumptions of growth etc as in table 13 we have estimated the demand for oil products c. 2010-11. Kerosene demand is estimated as a function of oil demand and the relative price between kerosene and oil products since the variable part of the demand for kerosene is expected to be determined by this relative price which drives diversion and substitution. The model and the estimates are reported in tables 14 and 15 respectively.

Kerosene demand with the same relative price ratios grows to above 15,000 MT from the 2003-04 sale of 10,000 MT. Since household demand on the whole could not grow above population growth rate, the true household demand today estimated at 70% of total supplies today cannot grow more than by 1.8% per annum. Therefore the rest of demand is on account of adulteration and in general use outside the household. The revenue losses at a rate in excess of 18% if inflation is assumed to grow at 5%.

The estimated revenue loss on account of leakage of kerosene outside the household sector use is as high as Rs. 17000 crore c.2010-11. If the “subsidy” on kerosene were to be measured with respect to the option of pricing (taxing) it at the same level as diesel then it is around Rs. 25000 crore today. This assumes that with a rise in retail prices of kerosene of Rs. 20 today the price would be nearly equal to that of diesel. The subsidy similarly computed for c. 2010-11 given the demands then and inflation having risen at 5% (if the same price ratio between diesel and kerosene is maintained) rises to over Rs. 50,000 crore c. 2010-11. See table 16 for the details.

The savings the exchequer would make in shifting to direct subsidies with the market price of kerosene moving up to that of diesel today, i.e., c.2003-04 is in excess of Rs 14000 crore larger than the reported “subsidy” which is only a measure of the compensation payments the government has to make to companies to hold the retail price of kerosene at the PDS prices. With tax reform (all taxes central and state going on value added basis, and a high value added rate that ensures revenue neutrality, the price of kerosene is expected to be no different from that of diesel if the trends elsewhere where such non-distortionary regimes is any indication. With reference to that price, in allowing an offset of Rs 20 per litre of kerosene consumed by the poor households the direct subsidy bill is of the order of Rs. 10000 crore giving a saving of Rs. 14000 crore today. The saving by the same token would in excess of Rs. 37000 crore c.2010-11. See table 17

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Table 1: Kerosene, and LPG Sales, and Sales per capita of Kerosene Equivalent Cooking Fuel

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Andhra Pradesh	591	598	614	641	653	676	683	638	596	552
	235	254	289	308	332	362	434	510	590	639
	14.78	15.15	16.06	16.71	17.28	18.17	19.89	21.03	22.33	22.62
Assam	255	260	266	268	277	281	280	278	280	262
	47	51	62	65	70	75	99	112	126	131
	14.53	14.77	15.57	15.59	16.07	16.36	17.84	18.47	19.32	18.77
Bihar	511	559	609	652	673	849	869	832	677	610
	90	99	114	125	136	148	173	183	170	183
	9.92	10.62	11.45	12.03	12.28	14.52	14.97	14.33	11.8	11.15
Delhi	238	240	240	243	243	233	206	210	200	190
	259	277	309	332	365	390	450	456	474	508
	69.11	69.71	72.41	73.61	75.95	76.09	79.85	78.14	77.1	78.56
Goa	27	29	28	28	28	28	28	28	24	22
	16	17	18	21	22	23	30	32	34	37
	47	49.38	49.68	53.33	53.96	54.99	64.12	65.47	64.31	65.05
Gujarat	790	806	813	829	858	847	839	863	803	771
	268	289	300	313	335	381	419	430	445	502
	29.7	30.37	30.39	30.77	31.84	32.96	33.08	33.25	31.86	32.92
Haryana	157	160	165	172	174	179	182	190	168	158
	93	105	118	133	150	172	251	229	265	304
	18.86	19.82	20.93	22.27	23.47	25.22	31.98	29.6	30.97	33.35
Himachal Pradesh	38	36	37	46	48	51	51	50	49	48
	17	21	28	36	44	49	56	51	61	64
	12.91	13.7	15.97	19.89	22.48	24.19	25.97	23.88	26.35	26.62
Jammu and Kashmir	104	108	125	121	134	137	154	150	152	152
	26	30	34	41	47	47	61	65	76	84
	18.14	18.89	21.03	21.8	23.77	23.41	27.19	27.08	28.59	NA
Karnataka	452	459	494	510	523	533	537	542	525	503
	150	170	194	209	223	246	310	366	415	461
	15.52	16.15	17.49	18.09	18.61	19.4	21.53	23.37	24.38	25.15

Table 1 (Continued)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Kerala	270	273	292	289	290	301	308	306	269	237
	100	116	134	142	174	189	217	275	312	358
	15.2	16.09	17.6	17.76	19.49	20.52	22.18	25.66	26.42	27.84
Maharashtra	1523	1519	1545	1563	1577	1584	1587	1527	1444	1389
	554	606	677	733	759	815	941	1008	1095	1212
	30.61	31.06	32.24	32.96	33	33.56	35.46	35.49	35.67	36.81
Madhya Pradesh	405	441	483	514	544	658	668	637	529	496
	154	168	185	199	210	226	264	289	282	316
	13.43	14.31	15.37	16.07	16.63	18.78	19.78	19.64	17.27	17.4
Orissa	175	204	212	235	246	311	344	336	317	312
	31	35	40	44	50	53	62	69	84	95
	7.04	8.02	8.41	9.16	9.66	11.51	12.74	12.72	12.82	13.06
Punjab	327	341	353	358	361	365	369	339	308	274
	129	148	168	182	206	225	286	317	374	428
	26.66	28.45	30.14	30.96	32.46	33.53	37.86	38.29	41.3	43.58
Rajasthan	286	306	331	356	372	442	455	514	435	419
	121	131	141	159	185	201	247	269	305	347
	10.92	11.46	12.07	12.93	13.86	15.4	16.83	18.19	17.52	18.26
Tamilnadu	666	671	683	696	692	712	743	727	637	585
	257	285	322	345	376	428	513	644	716	770
	19.87	20.62	21.77	22.48	23.14	24.84	27.71	31.16	31.62	32.05
Uttar Pradesh	976	1023	1095	1160	1197	1395	1420	1408	1306	1271
	355	399	456	506	576	634	781	762	763	873
	11.7	12.34	13.28	14.03	14.8	16.42	17.91	17.21	16.22	16.95
West Bengal	761	782	777	793	808	818	830	835	803	781
	159	176	195	216	242	273	320	362	384	418
	14.77	15.22	15.37	15.84	16.42	17.06	18.09	18.91	18.81	19.04

Figures in first row are LPG Sales in '000 MT ; Second row – kerosene in '000 MT and third row sales of both kerosene and LPG added together converting LPG to kerosene equivalent by the factor 28/15, i.e. Kg of “kerosene equivalent cooking fuel” per head per year

NB: Original data from the CMIE, Business Beacon

Table 2: Regression Results – for Log (kerosene Sold in ‘000 tonnes and (28/15)*LPG Sold in ‘000 tonnes)

Independent Variable /Dummy	Coefficient	t-value	Sig. level
CONSTANT	-6.038363	-11.5617	0.0000
Log Population (million)	2.040341	10.1341	0.0000
Log Per capita real GDP (‘0 Rs.)	0.646644	6.4180	0.0000
Assam	1.282575	6.8247	0.0000
Bihar	0.207205	1.7952	0.0744
Delhi	2.677928	6.1030	0.0000
Goa	4.703526	5.2498	0.0000
Gujarat	0.759274	5.8583	0.0000
Haryana	1.45583	4.8345	0.0000
Himachal Pradesh	2.6876	5.1568	0.0000
Jammu and Kashmir	2.512971	6.2431	0.0000
Karnataka	0.398265	4.2275	0.0000
Kerala	0.967843	5.3619	0.0000
Maharashtra	0.099026	1.9475	0.0531
Madhya Pradesh	0.318937	5.6144	0.0000
Orissa	0.499324	4.1113	0.0001
Punjab	1.531707	5.5659	0.0000
Rajasthan	0.201633	2.7623	0.0064
Tamilnadu	0.377996	5.1310	0.0000
Uttar Pradesh	-0.675441	-3.4860	0.0006
West Bengal	-0.08379	-1.8809	0.0617
R-Sq Adjusted = 0.9902			
F-Ratio = 946.746			
No of Observations = 189			

NB: Original data from the CMIE, Business Beacon

Table 3: Regression Results – for Log (Kerosene Sold in ‘000 tonnes + (28/15)*LPG Sold in ‘000 tonnes)

Independent Variable /Dummy	Coefficient	t-value	Sig. level
CONSTANT	-2.790871	-6.0414	0.0000
Log Population (million)	0.867991	13.8525	0.0000
Log Per capita real GDP (‘0 Rs.)	0.783893	8.6442	0.0000
Log Real GDP in Transport, Storage and Communications sector (crore)	0.113123	2.0103	0.0459

R-Sq Adjusted = 0.9492

F-Ratio = 1116

No of Observations = 180

NB: Original data from the CMIE, Business Beacon

Table 4: Assumptions in Trucking Operations to Estimate the Economics of Adulteration

Engine overall cost (Rs.)	90000
Kilometres truck would have covered by the time of overall in normal course	150000
Reduction in kms before overhaul	0.18
Average kms covered by truck in day	300
Cost of truck	100000
	0
Cost of engine	300000
Reduction in overall engine life	0.12
Mileage of truck (average loading) kms per litre	5
Reduction in mileage due to fuel adulteration	0.06
Price of diesel (Rs per litre)	40
Market price of kerosene (Rs per litre)	10
Per cent of adulteration	0.3
Life of truck in years	12
No of operating days in year	300
Cycle Time Assumed (Years)	3
Additional FA required	0.05
Return on TCE	0.12
Max Reduction in kms before overhaul	0.3
Max Reduction in overall engine life	0.2
Mac Reduction in mileage	0.1
Ceiling of adulteration for model	0.5
Debt Equity Ratio	3
Bank lending rate for trucking business	0.1

Table 5: Operational Economics over Three Years for Adulteration Level of 30% of Diesel with Kerosene (Rs. unless otherwise stated)

	Without Adulteration	With Adulteration
Cost of fuel without adulteration	2160000	1780851
Engine overhaul cost	54000	65853.66
Depreciation cost of engine	75000	85227.27
Costs above	2289000	1931932
Difference in cash flow		357068
Cash due to Net Return on total capital employed	378000	735068
Return on TCE per annum	0.12	0.23
Cash due to Equity Return	141750	498818
Return on NW	0.18	0.63

Table 6: Some Aspects of the Kerosene Distribution System in Gujarat

No of Households as Per NSS 2003-04	9830900
No of Ration cards c.2005	11400132
No of Non Gas Ration cards c.2005	8611013
No of Fair Price Shops	12485
No of Ferrywalas	3401
Allocations	
Ahmedabad and Baroda City (Litres per card per month)	15
AUDA limit (Litres per card per month)	12
Rest of Gujarat (Litres per card per month)	10
No of LPG Connections c.2004	4417039
No of LPG Connections recognised in kerosene allocations	2789119
Extra kerosene being allocated at approx. 11 litres per card per month. for the year (KL)	368164
Industrial SKO Price c. 2005 (Rs per KL)	36807.5
PDS price c.2005 (Rs. per KL)	8850
Revenue loss on account of "extra allocations" Rs. crore per annum	1029
Population of Gujarat, c.2005	52840000
Persons covered per FPS	4232
Consumption of kerosene recognising the "extra allocations" KL per year c.2004	609128
Kerosene sale per FPS (incl. ferrywala sales) KL/year (incorporates possible diversion, and higher demand due to subsidy)	48.79
Turnover in Rs. lakhs per year on account of PDS kerosene per FPS	4.3
Turnover required for a 10% margin and gross profit of Rs. 3.0 lakhs per year (Rs. lakhs per year)	30.0

Table 7: Inspection Requirements and the Estimated Cost of the Same Under the Current PDS System of Price Based Subsidisation for Kerosene in Gujarat

No of persons	52840000
No of families	10739837
Cardholders proportion	0.80
No of cardholders	8611013
Cards per RO	1812.463271
No of ROs	4751
Frequency of Release per month	4
Time for checking each RO (hrs)	3
Total time for checking only the accounts	57012
Travel time between each RO	0.75
Time incl. travel time for checking	3.75
No of ROs an inspector can cover in a day	2.40
No of mandays required	7918.33
No of manday per month available per inspector	24
No of inspectors required	329.93
Cost to government of inspectors at a wage cost of Rs. 4 lakhs per person per year (Rs. crore)	13.20
Cost per litre on account of inspection	0.1351

Table 8 Some Aspects of The Demography of Rural Gujarat

No of districts	25
No of blocks	224
No of villages	18859
No of panchayats	13711
No of blocks per district	9
No of villages per block	84
No of villages per district	754
Total population of rural Gujarat	32500000
No of ISECs estimated	6605691
No of ISECs with endowments (BPL Cards) (assuming 20% of rural Gujarat are poor)	1321138
No of cards per village	350
No of cards with endowments per village	70

Table 9: Some Key Features Related to the Kerosene and LPG and Subsidisation in Gujarat

	2000-01	2001-02	2002-03	2003-04
LPG sales MT	433126	462616	507914	540006
LPG customer base (no of connections)	3700674	3875148	4123508	4417039
LPG customer base on the basis of one cylinder 12kg /month of consumption	3007819	3212611	3527181	3750042
Kgs of packed LPG sold per connection	107.2	113.9	112.6	116.7
Population of Gujarat (million)	49	50.1	51.27	51.89
Estimated Households in Gujarat (4.92 per HH)	9959350	10182927	10420732	10546748
NSS Households (Nos)	9283371	9491773	9713437	9830900
Kerosene releases under PDS	1066358	1022697	1005732	977292
Families covered by kerosene on the basis of 2.5 Lit/ Card/Week	8202754	7866900	7736400	7517631
Estimated no of families covered by either PDS kerosene or subsidised LPG	11903428	11742048	11859908	11934670
Estimated no of families covered by either PDS kerosene or subsidised LPG (% to total estimated families)	112.56	108.80	108.09	106.84
Estimated no of families covered by either PDS kerosene or subsidised LPG (% to total estimated families)	128.22	123.71	122.10	121.40
Price of SKO (PDS) Rs per KL (based on Ahmedabad City prices)	120.76	116.73	115.96	114.61
Price of LPG (Subsidised) Rs. 14.2 kg cylinder (estimated)	7150	8546.5	8580.5	8576
Price Index of LPG (WPI)	227.63	245.36	260.88	262.35
Total expenditure on kerosene and LPG per month (Rs.crore)	247.8	267.1	284	285.6
Expenditure on LPG and kerosene (Rs/month/family)	121	139	150	153
Fuel and Light NSS per month	121.89	136.94	143.63	145.05
Electricity sales to domestic sector million units	42.40	48.33	55.10	62.81
Price of electricity per unit	3122	3466	3813	4194
Expenditure on electricity per month per family for all Gujarat	2.43	2.65	2.915	3.2065
Expenditure on electricity per month per family (SEBs sales only)	85	101	119	142
Elec+LPG+kerosene	68	81	95	114
NSS fuel and light expenditure per month per Household (Rs.)	207	238	263	288
	209	238	271	309

Table 10: Dealer and Reseller Economic Analysis

<i>Assets:</i>		
Tanker Truck		80000
Land 600 sq yards		300000
<i>Operations' Details:</i>		
Volume sold (kl)		177
Margin earned (Margin is less by Rs 43/kl without the plot of land) (per kl)		447
Number of trips		17
Distance per trip km		100
<i>Operating expenses:</i>		
Driver's cost		5000
Cleaner's cost		3000
Security cost		2000
Clerical cost		2500
Maintenance of vehicle		1000
Fuel cost per km		12
<i>Revenue and Expenses:</i>		
Revenue earned		79137
<i>Costs:</i>		
Salaries	12500	
Vehicle	21400	
Total		33900
Net inflow		45237
Add: Value of 1% loss (permitted officially)		15203
Monthly return:		11.90%
Annualized return		285.63%
Monthly return (without loss)		15.91%
Annualized return (without loss):		487.80%

See text for details: (Based on Dealer 'Shree Ram Petroleum Co. Dealer: Mr. Ashok Modi)

Table 11: Summary of the Current Situation, Costs, Delivered Benefits, of the Present and Proposed Systems and Fiscal Savings in Moving to the Proposed System

Present System		
1	Current actual fiscal cost of subsidy (Rs. crore) per year	24540
2	Current reported subsidy (without accounting for duties) [total consumer subsidy including to unintended beneficiaries] per year	10000
3	Subsidy currently delivered to BPL and near BPL households (Rs. crore) per year	7362
4	Current administrative cost per litre of kerosene delivered arising out of parallel distribution (Rs. per litre)	0.25
5	Kilo litres of kerosene released under PDS per year	12269939
6	Current administrative cost of parallel distribution channel (direct based on additional margin (Rs. crore) per year	307
7	Current indirect cost of PDS monitoring and inspection (indirect incurred by government's civil supplies dept) based on 4500 inspectors required on an all India basis and their cost of employment per year to government of Rs. 3.00 lakhs per employee per year	135
8	No of families	200000000
9	No of BPL families at approx 20% of all families	40000000
10	Benefit delivered per BPL family during the year today (Rs. per family per year)	1840
11	True fiscal cost of subsidisation today (Rs. crore)	24982
12	Cost to benefit delivered ratio (11)/(3)	339.33%
Aspects of Proposed Direct Subsidy System		
13	Cost of "owners' consultation" and evaluation of vendors;	5
14	Cost of identification @ Rs. 500 per card (i.e. per family) one time cost; including that of survey, for identification with appropriate safeguards as in this report (Rs. crore)	10500
15	Total one time cost Rs crore	10505
16	Cost one time cost and cost of identification attributable to the need for kerosene subsidisation at third the above cost (Rs., crore)	3505
17	Amortization of one time cost (item 16) over a 20 year period of the cost of identification share of kerosene, at 5% interest rate (Rs per year)	281
18	Benefit to the delivered per family (10 litres of kerosene for 12 months with a subsidy of Rs. 20 per litre to all BPL families) (Rs. crore per year)	9600
19	Cost of annual transaction @ 2% of value transacted for BPL families	192
20	Total annual cost of subsidisation (Rs crore per year) [(17)+(18)+(19)]	10073
21	Cost to benefit delivered ratio [(20)/(18)]	104.93%
22	Fiscal Savings (Rs. crore per year) [(11)-(20)]	14908
23	Fiscal Savings + Additional Benefit to Consumers	17146
24	Social savings (removal of incentive to adulterate and divert, savings on account of prevention of pollution resulting from adulteration, savings from avoiding additional wear and tear of engines, in avoidance of directly unproductive activities like bribery, extra monitoring and vigilance by oil companies, avoidance of political pressure on selection of dealers, extension of small cost to other subsidies with large savings therein -food and electricity)	Not calculated

Table 12: Regression Results – Petroleum Product Sales All India ('000 tonnes) 1981-82 to 2003-04

Variable / other	Coefficient	t-value	Sig.level
Constant	2.164825	1.4088	0.1769
Log population (crore)	0.070973	0.1022	0.9198
Log real GDP per cap	1.109786	3.7685	0.0015
Log (WPI Mineral oils /WPI All commodities)	-0.215874	-2.9867	0.0083
Log (Share of services in GDP)	1.036141	2.9907	0.0082
Log (Share of electricity gas and water in GDP)	0.159455	1.3445	0.1965
R-SQ. (ADJ.) = 0.9963			
F-Ratio = 1189.68			
No of Observations = 23			

Original Data from the CMIE (Business Beacon)

Table 13: Forecast of Demand for Oil Products for the Indian Economy in 2010-2011 in '000 tonnes based on Results of Regression as in Table...

Current 2003-04 demand	107767
GDP Growth forecast (% per annum)	6.5
Population growth forecast (% per annum)	1.8
WPI Mineral oil /WPI all in 2003-04	1.56
WPI Mineral oil /WPI all in 2010-11	1.66
Share of services in 2003-04	0.51
Share of services in 2010-11	0.53
Share of electricity in GDP in 2003-04	0.02148
Share of electricity in GDP in 2010-11	0.02
Demand for oil products in 2010-11	170495

Table 14: Regression Results – Log kerosene Sales All India ('000 tonnes) 1980-81 to 2003-04

Variable /other	Coefficient	t-value	Sig.level
Constant	2.23574	3.7912	0.0011
Log fitted value of oil product sales from regression in table ('000 tonnes)	0.617229	11.7314	0.0000
Log (WPI kerosene /WPI Mineral oil)	-0.191603	-2.8772	0.0093
R-SQ. (ADJ.) = 0.9339			
F-Ratio = 156.34			
No of Observations = 23			
Original Data from the CMIE (Business Beacon); Regression results in table..			

Table 15: Forecast of Demand for kerosene for the Indian Economy in 2010

Current 2003-04 demand for oil ('000 tonnes)	107767
Forecasted Demand for oil in 2010-11 ('000 tonnes)	172650
Demand for kerosene in 2003-04 ('000 tonnes)	10230
Forecasted Demand for kerosene in 2010-11 (no price adjustment in kerosene) ('000 tonnes)	15172
Forecasted Demand for kerosene in 2010-11 (Full price adjustment ie price to other oil products increasing three times) ('000 tonnes)	12292
Forecasted Demand for kerosene in 2010-11 (half the price adjustment takes place) ('000 tonnes)	14038

NB: The demand for kerosene is based on the estimated demand for all oil products and the regression results in table...

Table 16: Implications for Subsidy if there is no Change in Policy and Price Based Subsidies continue at prices with the same relative difference

Detail	Amount	Unit
Total kerosene demand today c.2003-04	10230	000 MT
Adulteration and use non-households today assumed to be at 30% of total demand c.2003-04	3069	000 MT
Derived household demand	7161	000 MT
Revenue loss (assuming Rs. 20 to the net revenue loss for a litre of kerosene to be sold instead of kerosene) c.2003-04	7511	Rs.crore
Demand c.2010-11 (no price adjustment assumption)	15172	000 MT
Household demand c. 2010-11 having grown at 1.8 % per annum (population growth rate)	8113	000 MT
Adulteration and use non-households c.2010-11 (assuming household demand is no higher than today)	7059	000 MT
Revenue loss (assuming to the net revenue loss for a litre of kerosene to be sold instead of kerosene) c.2010-11	17276	Rs.crore
Revenue loss incorporating inflation in oil prices at 5% per annum	24309	Rs.crore
Rate of growth of revenue loss	12.6	% per annum
Likely revenue loss growth rate given a likely inflation rate of 5%	18.3	% per annum
"Gross Subsidy bill" c. 2003-04 (estimated at Rs. 20 per litre of kerosene)	25038	Rs.crore
"Gross Subsidy bill" c. 2010-04 (estimated at Rs. 20 per litre of kerosene)	37134	Rs.crore

NB: The "gross subsidy" is the notional total revenue loss arising in not pricing kerosene at the level of diesel with all its taxes.

Table 17: Impact of Direct Subsidy to Poor Families Instead of Price Based Subsidies as Current Today

"Gross Subsidy bill" c. 2003-04 (estimated at Rs. 20 per litre of kerosene)	25038	Rs.crore
"Gross Subsidy bill" c. 2010-04 (estimated at Rs. 20 per litre of kerosene)	52251	Rs.crore
Estimated "Poor Families" (20% of all families) c. 2003-04	43617886	nos.
Estimated "Poor Families" (20% of all families) c. 2010-11	49419581	nos.
Direct Subsidy bill at Rs 20 per litre of kerosene and 10 litres per family per month	10468	Rs.crore
Direct Subsidy bill at Rs 20 per litre of kerosene and 10 litres per family per month	16689	Rs.crore
Savings c. 2003-04	14570	Rs.crore
Savings c. 2010-04	37681	Rs.crore