भारतीय प्रबंध संस्थान बेंगलूर
INDIAN INSTITUTE OF MANAGEMENT
BANGALORE

WORKING PAPER NO: 241

Corruption: Market Reform and Technology

Murali Patibandla
And
Amal Sanyal

Year of Publication-October 2005

Please address all your correspondence to:

Murali Patibandla
Indian Institute of Management Bangalore
Bannerghatta Road
Bangalore 560056, India
Email: muralip@iimb.emet.in
Phone 080-26993039
Fax 080-26584050

Corruption: Market Reform and Technology

Murali Patibandla

and

Amal Sanyal

Abstract: The paper provides a taxonomy of corrupt activities in terms of the source of illegal rent involved. It identifies two types of deterrent policies: discouraging and monitoring. Using these as tools, it analyses the probable effects of India's ongoing reforms and of her resourceful information and communication technology on the future incidence of corruption. It argues that illegal rents on scarcity outside governance will experience perceptible fall, while significant contribution from the technology sector will be required to reduce corruption in governance. The paper also examines their possible roles in corruption based on information and strategic position.

Corruption: Market Reform and Technology

1. Introduction

Pro-market reforms and information and communication technology (ICT) are widely believed to be important instruments for enhancing efficiency. Our paper asks a different question about these two instruments: how effective are they in fighting corruption? We suggest a typology of corruption, and argue that the type of corruption determines which of the instruments would be effective if at all, and to what extent. To make markets contestable and let them find equilibrium without intervention can reduce or eliminate certain types of corruption but not all. In some cases we need contributions from ICT. There are yet others where the two instruments should be used in a complementary way. Finally, some types of corruption are immune against both market reform and ICT.

In section 2 we define corruption and introduce a typology. Here we also distinguish between two types of intervention: discouraging and monitoring. Section 3 discusses the nature of illegal rent from scarcity, and analyses the probable effect of market reforms on this type of corruption. Section 4 analyses the special type of corruption in the provision of governance, and the contributions that ICT can make to discouraging and monitoring. In section 5 we discuss the possible sources of new rents in the deregulated environment, and explore how ICT can help in coping. Section 6 discusses the problem of asymmetric information, and to what extent market reform and technology can help in reducing illegal rent arising from it. In section 7, we take a brief view of political corruption. Finally section 8 is a short conclusion.

2. A Typology of Corruption

An action can be corrupt either morally or legally or in both ways. We will use the legal sense and define corruption as extraction of an illegal rent. Literature usually classifies corruption by the domain of occurrence or the type of event, e.g. income tax evasion, under-

invoicing, kickbacks taken by politicians and so on. This enables researchers to sort out the optimisation exercise of the corrupt agent in a particular kind of offending decision, and helps understanding that type of corruption. Our purpose however is to explore the structural aspects of corruption so that we can relate them to potential solutions. Accordingly we propose to classify it in terms of the source of illegal rent involved in a corrupt action.

All illegal rents can be traced to three primitive sources: scarcity, information and position. Scarcity of a good or service leads to a wide variety of corrupt practices. In case of goods, price regulation, quantity limits, zoning, differential tax treatment in different states and so on, lead to unavailability of the good at the potential market-clearing price. This creates the opportunity of a scarcity rent. In the case of a service, it is easy to threaten not to provide it unless a bribe is paid, if there is no alternative provider. Monopoly of a service creates this possibility as in the case of government services.

In simple micro economic terms, the policies such as the licensing for entry of firms result in monopolies. The monopoly pricing leaves out the people from the market who can not afford the price which is a form of scarcity. If the monopolist undertakes perfect price discrimination, he charges different prices from different consumers depending on their willingness and ability to pay. The total market is served, and the last and poorest consumer pays a price equal to marginal cost. The monopolist takes away the consumer surplus. This extraction of the total surplus is the rent or a form of corruption that arises out of monopolies. The mechanism can be characterized as the richest consumer pays the highest price instead of standing in the queue while the poorest waits the longest. The poor gets included in the market by imposing a transaction cost on them. The perfect price discrimination may not take place if there are transaction costs of identifying consumers with different abilities and if there is price arbitrage. This was a common practice in India prior to reforms in areas such as

getting gas and telephone connections. The rich who could pay the bribe got them immediately and the poor had to wait long periods.

Another way of defining scarcity is that the economy has the capacity (capital) to produce a particular or several goods but inefficient institutions discourage investments. One element of inefficient institutions is insecure property rights through predation by the government (threat of government taking over) and private agents (mafia). An example is the effect of the rent control act in the cities such as Mumbai. Under the act, a landlord cannot evict a tenant. Consequently, most flats that were built in Mumbai are not put for rent despite huge demand (Patibandla, 2005). Although this example does not directly refer to government corruption, ill-defined property rights provide strong discretionary powers to government agents to appropriate public and private property. The threat of appropriation leads to payments of corruption. Secondly, the government agents can appropriate the public property. To give an example, in several urban areas the government ministers and bureaucrats appropriate the public lands and sell them in the open markets.

Illegal rent on information arises in a variety of situations. The simplest case is tax evasion. Because a taxpaying unit owns private information about its own income or transactions, it can get an illegal rent by evading taxes. There are many other widespread forms. Insider trading involves a person using a company's internal information for personal gain. An auditor extracting rent from a tax offender, like an insider trader, uses the information gathered in his professional capacity for personal rent. Informational asymmetry across different economic agents and between government agents and the populace can arise out of inefficient institutional conditions. If the rules defined in complex or vague terms, a poor and

illiterate persons ability to receive and process information about her rights and obligations is limited. This gives powers to government agents to extract bribes from her. For example, in several instances one finds in India's airports that returning emigrants from the gulf, most of who are semi-illiterate, being harassed by the customs officials even though they are eligible to bring in certain amount of foreign goods under the prevailing rules. The illiteracy suits the interests of government agents, which is also a larger political economy issue.

Finally, illegal rent from position is extracted by persons in strategic positions, which enable them to either confer a benefit or inflict harm. Politicians and bureaucrats in strategic positions in the government can extract kickbacks for government purchases, licenses, permits, amnesty and so on. Persons in the judiciary can behave similarly. Members of the police force can demand bribes for the favour of not prosecuting. Note that rent on position can be extracted by all three constituents of the government: the legislature, the executive as well as the judiciary. They can be extracted outside the government as well, e.g. by local musclemen, trade union bosses, opposition politicians and so on.

The power of the position increases especially if the formal rules are defined such a way giving high degree of discretionary powers to the government agents, which gives them the powers to define them in accordance with the context to suit them. The government agents can collude, irrespective of competing parties, to augment their powers of discretion. In the parliamentarian democracies the executive is basically the majority members in the parliament. This gives them high degree of powers to enact laws to suit their interests (of the executive) with no checks and balances. To give an example in the year 2005 (August), when the Supreme Court ruled against the government's move to implement reservations in the private unaided educational institutions, the members reacted to make constitutional amendments to restrict the powers of the court.

An act of corruption need not always involve a single source of rent. Different types of rent can co-exist in a single corrupt act. For example corrupt rents from position and information combine together in bribe chains[1]. The lowest level in the chain collects bribes from members of the public using their *position*. They in turn pay bribes to their superiors in command because the latter have the *information* of the goings on. These chains have been reported in police, customs, income taxes and among railway inspectors[2]. But they can potentially exist along the hierarchy of any regulatory authority.

We analyse the potential role of reforms and ICT in reducing corruption. For this discussion we introduce a twofold classification of intervening actions. Those that discourage (or in the limit completely disable) choosing a corrupt action will be called discouraging actions, and those that increase the likelihood of being punished of a corrupt action will be called monitoring actions. For example, simpler tax structure, fewer rebates, deduction at source etc are discouraging actions for income tax evasion, while better audit of returns and speeding up litigation is a monitoring action.

3. Scarcity Rent and Market reforms

A variety of corrupt practices arise directly from scarcity. In any functioning market, there always exist a set of buyers who are willing to pay more than the equilibrium price, if necessary. In normal market arrangements, they do not pay this amount because the good is freely available at a lower price. But they can be made to pay it by threatening the availability. Any arrangement that hinders the availability of the good at its market-clearing price creates this effect. Price regulation or quantity control, for example, threatens the availability of a good at its market-clearing price, enabling sellers to extract a premium from

[1] For an interesting account of chains of corruption and bribes, see Wade (1988) and The Policy Group (1985).

[2] For an analysis of the working of bribe chains see Sanyal (2000).

those who are willing to pay. This is how a black market arises for a rationed good[3]. Scarcity rent however does not necessarily arise from government regulation or control. In a monopoly or oligopolistic market, dealers can extract higher than announced price from some buyers. In these markets, a buyer who is able will pay more than the prescribed price if threatened with unavailability or long wait. An example in point is the premium dealers used to charge for new cars and two-wheelers over announced prices, only some years ago[4].

In some cases, the scarcity is not transparent because it relates to something, which is not being traded at all. There may be adequate supply of cooking gas cylinders at its current price in a town, and yet to get one, buyers pay a premium over the price of the cylinder. The reason is that the delivery service which is an integral part of the deal is not being openly traded. Consumers are willing to pay for not only the gas but also rapid delivery. But the good 'rapid delivery' is not on sale. The delivery person is able to extract an illegal rent for this scarce service. Note that the bribe would disappear if the scarcity of 'rapid delivery' was eliminated, e.g. if the gas company employed more delivery persons or designed an incentive for the delivery person to speed up. Most types of 'speed money' are of this variety: when there is demand for so-called 'speed' but no market for it, or the market is under-developed[5].

When an illegal rent arises directly from scarcity, market reforms are expected to be effective in reducing or even eliminating it. As controls and regulations are removed, product markets tend to find clearing prices, at which all who can and want, buy it, leaving no space for illegal rents. At the same time, competition and contestability disable rent-seeking based on the

---

[3] Classic analysis of scarcity and black markets are Scitovsky (1942) and Samuelson (1958).

[4] In some cases, a dealer could charge different rates of premium depending on the customers' willingness to pay and the market would tend to first degree price discrimination.

[5] Bribes extracted with the threat of delay have been analysed in Sanyal (2004).

threat of unavailability. Apart from reducing scarcity rent directly, competition also helps establish missing markets behind corruption. In the gas cylinder example, if a number of gas companies were in the market, they would discover that faster delivery helps them compete better. They would react by buying 'rapid delivery' from their delivery people with more incentive compatible contracts.

There are however cases where well-developed, not under-developed, markets extract rent from scarcity. Can market reform help in these cases? In most cases, it can. Generally a well-developed illegal market is the reflection of a related legal market, which is under-developed or regulated. It is the latter that generates the scarcity, while the rent is extracted in the former. For example, transmitting foreign currency through well-developed illegal markets is the result of non-market valuation of currency and/or restrictions on the legal market. The illegal market for gold in India sprang up in response to the Gold Control Act of 1962 and the institutions set up to enforce it. Reform of the legal markets can bring the corresponding illegal markets to an end.

When market reforms are able to reduce a scarcity rent, the action is 'discouraging' in terms of our classification. Corruption disappears in this case because the source of the rent disappears, or becomes too small to warrant a risky action. A discouraging solution through reform is preferable to costly monitoring action. The cost of monitoring is generally large: it includes enactment of laws, setting up regulating institutions and the actual cost of information collection known as auditing. Auditing cost depends on the technology of information gathering and the chance of subversion by venal auditors. Finally the gain is probabilistic. Hence a discouraging solution whenever attainable through market reform is preferable.

4. Government Services: Scarcity, Information and ICT

Services produced by the government can be classified as those related to governance and those that are not. The latter can be produced and sold by the private sector as well. The government has opened up some of them to competition, while others are subject to incomplete but steady deregulation. As the government gradually opens up these services to competition, scarcity-related corruption in these sectors are expected to fall. Typically this is the kind of corruption that increases the cost of living most directly: bribes paid for electricity, water and telephone connection and repairs, railway reservation, admission to hospitals, buying cooking gas, coal and kerosene and the list continues. These bribes, widespread until fairly recently, are receding and hopefully will disappear if reforms continue.

But in governance-related services, illegal rent from scarcity eludes easy market solution. In these services corrupt rent is extracted from the interplay of scarcity and position. Services like registration, passports, birth and death certificates, driving licenses, inheritance and succession, FIR at police stations, getting a date at a law court etc, are examples. Those at the front office of these services can charge a rent, which partly arises from their position at the front office of a monopoly provider, and partly from the relatively slow provision rate given the technology of processing. Providers can favour a bribe-payer with faster processing and delivery. Large number of applications and the outdated technology ensure a long queue of un-served applicants at any point of time. This makes the favour of queue-jumping worth paying for. Some countries have been opting for market-based solutions by outsourcing them with performance-related contracts.[6] However the transition is difficult for many services,

[6] The option, however, is not novel. Ottoman, Mughal, Qajar, and Manchu emperors and the sixteenth and seventeenth century Europian rulers often outsourced the collection of taxes to private merchants or noblemen.

where new laws and institutions are required to protect the privacy of citizens and confidentiality of state information. In India this solution is further limited at the present moment by the fact that the government is the largest employer in the organised sector. Any large scale transition will seriously destabilise the labour market in the short run.

It is in this sector that ICT can be of significant help by designing solutions for information processing, storage, verification and certification. There are two separate parts of the solution. The first is house-keeping, retrieving and processing of information within an office, and the second is the front-office interface with the citizen, through which documents are applied, paid for, and received.

The technology for the first part of the solution, the monitoring technology, is not very challenging but its implementation is, because it requires inputs other than technology. These projects involve winning over cultural resistance and organised opposition within government departments arising from fear of job loss and shift of intra-office power equations. Hence it requires deft organisational leadership in government departments and overall a political will.[7]

Though monitoring technology solutions increase efficiency through faster processing, and for customers, easy access to information, it can not entirely eliminate corruption. Even when the technology is revolutionised, a rent of position can be extracted unless the application and the delivery process are automated and impersonal. There is no doubt however that the incidence of corruption will fall with better monitoring technology, because it helps better supervision of the goings on in the front office. In these services those who do not pay bribes

---

Minting and coinage were also auctioned to private sector until fairly recently. See Braudel (1983), Swart(1980) and Theobald (1990).

[7] For an interesting account of the role of these inputs in e-governance projects of Andhra Pradesh, see case studies reported in S. Krishna and Geoff Walsham, Information Technology for Development, Vol. 11 (2) 1–18 (2005).

face slower service, often deliberately made tardy. When complaints about tardiness are investigated, offenders typically hide behind the excuse of slow technology. Improvement of in-office technology makes internal supervision more potent by eliminating the habitual offenders' excuse. But to completely eliminate these bribes, the only sufficient condition is to design discouraging technological solutions, by introducing automated analogues of front-office interfaces.

There are two major obstacles to this project. First, illiteracy prevents many from using computer-based applications. The second is that majority of users are not in a position to make on-line payments. Since it is the illiterate and the poor (without bank account) who are more likely prey to front-office bribe, available technology of online application and internet payment would not liberate the bulk of victims from these bribes. As economists we can only hope that the problems will be circumvented. Perhaps, easy to use tools of Community Informatics[8], touch-screen operations and a combination of pictures and icons can tackle the illiteracy problem, and machines that accept rupee notes, the payment problem. If a suitable impersonal delivery system for documents is added, we can see the outlines of a discouraging solution to corruption in government service provision. Like in the case of monitoring solutions, the discouraging solutions, too, are not entirely technical. They require serious support from local support agencies like Panchayati Raj institutions, NGO's, Self Help Groups or some other institution such as cooperative societies.

Unlike reform-based solutions, which are essential bi-products, ICT solutions require a separate source of funding, and hence sponsors. Many e-governance projects fail to sustain after the initiating funding agency withdraws (see footnote 13). There is need for serious

[8] For example, Community Software Solution Framework, such as eNRICH (http://enrich. nic.in) developed by NIC.

innovation so as to build some revenue and employment generation capacity into e-governance projects to make them sustainable.

5. ICT: Transition to De-regulated Environment and After

In the new environment what are the new sources of positional rent, if any, directly resulting from the reforms? A possibility of new rent arises from the fact that de-regulation, quite ironically, does not do away with monitoring. Just as regulation requires monitoring, so does deregulation. Is it possible that the regulators of the new environment will extract rent for 'selectively regulating', thus re-establishing the familiar nexus of big business and the regulator[9]? The probability of that however appears small. The chance of capture of an institution monitoring deregulation is much smaller than one monitoring regulation. The reason is that with fewer entry barriers, the number of players in each industry increases significantly, and industry associations become broad-based. With a large number of members each with vested interest in the business environment, associations are expected to keep effective watch over official monitoring institutions[10]. In an industry with a broad-based association, the ability of individual members to obtain illegal deals from regulators is small since it hurts the interests of the majority.

But there is a second source that is a real possibility. Increased sophistication and complexity of economic activity have been pushing the mode of doing business beyond the traditional and the familiar. There are local firms, foreign firms, joint ventures among private, public and transnational entities, family-owned businesses, PSU's, alliances and various input and

[9] In an interview to *Newsweek*, Ratan Tata has recently complained that some business pressure groups are slowing down specific reforms (Financial Express, June 27, 2005).

[10] NASSCOM, the software industry association has been effectively protecting and pushing for de-regulation, as the association grew in membership in recent years. Certain other industry associations, which were previously dominated by big houses have become broad-based and representative of the industry.

service sharing arrangements in the business scene today. Outputs and trades range from the most traditional to the most awe-inspiring futuristic goods and services. Inputs are bought using both traditional market instruments as well as a variety of contractual instruments involving human capital and intellectual property of a wide variety. All this is leading to novel forms of contracts. Add to them the complexity of contracts introduced by new financial instruments. They are giving birth to a new generation of disputes, which are neither the business of regulators nor of industry associations. Add to them those brought to courts by official institutions like excise, customs, income-tax, FEMA authorities and the Registrar of Companies[11]. The number of these disputes and their legal complexity are growing very rapidly, and is adding to already existing long queues.

Legal settlement is a monopoly service, and as we have seen, delays under monopolistic provision, particularly, when it costs money and business, is a recipe for illegal rent. Rent in this context means payment in excess of the statutory rate to someone in the legal establishment. It takes many forms. Clients are forced to pay at more than the official rate for registration. They pay to fix each date for hearing. Clients for whom the cost of delay is high, are willing to pay large sums to get an early hearing. They also pay more than the statutory amount for the documents of each session of hearing. Parties with weak legal positions can pay in order to postpone hearings, wear out the patience or finances of the opposition and force out-of-court settlements. Large illegal income is also generated through out-of-court settlements.

[11] All of them except the last one have semi-judicial power, yet the number of disputes they bring to the courts is large. There are 40,000 pending disputes brought in by the Registrar of Companies at the moment, and they take on average about 10 years to settle. It is speculated that the new Companies Act, based on the draft by the JJ Irani Committee, is considering giving semi-judicial power to the Registrar of Companies as well.

India's competitive edge of well-developed property laws is blunted by unacceptable delay and corruption in getting settlements. Here is an important potential role for information and communication technology not only to de-clog the system and ward off corruption, but also to complement the reform process. To de-congest, the judiciary and the legal profession need solutions to update knowledge and information at a tearing speed, and need all that information at call[12]. If in place, the solutions should reduce the length of queues, which will have some effect on the corruption at the lower end. Secondly, technological solution is required for the management of scheduling and allocation of cases. These would serve as monitoring solutions, enabling the court management to monitor the queuing process and keep queue manipulation in check. Finally, we should strive to let clients register, obtain hearing dates and retrieve session documents impersonally through automated devices as final discouraging intervention.

In several regions in India, especially in the North, land records do not exist making property rights of ownership, both the public and the private, tenuous. This results in multiple sale of a given land by the middlemen and also multiple registration by government bodies. This leads to legal disputes among the payees for the land. Apart from this, government agents could threaten to appropriate the land from a person who paid for the land by claiming it as public property. In the southern part of India in cities such as Bangalore, when the land registrations are computerized with proper documentation of proofs including the photographs of the purchaser, the incidence of multiple sales decreased. This improvement combined with the rapid growth of the city resulted in huge pay offs of front-end bribes to the registration officers (Patibandla, 2005).

[12] These solutions have a large potential demand, expected from the formal legal system, semi- judicial bodies, law firms, industry associations and business as well as business and law schools.

6. Information Rent: Reforms and ICT

Illegal rent from asymmetric information presents a difficult challenge. Markets supposedly fail with asymmetry, and hence market reform *per se* can not be expected to be a cure. We will make a few observations on the question.

In India tort laws are not developed. The legal status of most forms of moral hazard is unclear and they go unpunished. The reason is historical, namely that no interest group has pushed for systematic laws relating to moral hazards. More frequent forms of cheating with asymmetric information have preyed on households or public bodies rather than organised private interests. Households did not have the resource or will to press for legislation. In case of public bodies, offenders, generally insiders, have been treated as per the power equation of the day—either whitewashed or politically victimised, without anyone feeling the need to press for appropriate laws. Indian business has avoided large moral hazards by repetitive interaction among a set of business and caste groups. This historical pattern is changing. With growth of markets and business, forms of moral hazard specific to particular types of contracts are expected to recur with significant frequency. We expect this process to result in pressure from business groups or associations, both domestic and transnational, for laws about the recurrent types. We also expect that more formal and detailed contracts in all areas of business will replace the regime of loose contracts tied to reputation and group loyalty.

In this process the government has to take the initiative for discouraging policy, and our technology sector to provide the monitoring options. Discouraging policy in this context involves enacting appropriate laws, disclosure rules and institutions. This is a complex exercise because it has to encompass moral hazards in a wide range of contracts— in traditional business as well as in those involving financial instruments, human capital and intellectual property. The process is well under way with the recent enactments like The

Securities & Exchange Board of India Act, 1992, The Arbitration and Conciliation Act, 1996, Trademarks Act, 1999 and so on.

The need for contribution from the technology sector will arise in two areas. First, moral hazard is ideally tackled by formulating appropriate contracts and monitoring them effectively. Tort laws usually serve as a threat against breach of contract, and in most cases equilibrium behaviour does not entail the actual use of the legal system. Technology will be required to design effective monitoring solutions for widely divergent types of business contracts. Secondly, to the extent that breaches of contracts or disputes arise, the legal system will come up against a bottleneck of forensic resources. Existing resources in this area are too dated to handle fraud or breach of contract in areas of accounting, finance, human capital, intellectual property, the internet and electronic data. The technology sector will be very much in demand to come up with new forensic solutions to establish offence or innocence.

7. Rent from Political Position: Where are we now?

We have earlier argued that rent of position at the lower end of government is expected to decline if governments successfully pursue e-governance[13]. But what about corruption at higher positions? De-regulation has the virtue of cutting down the number of centres of authority—the bureaucratic windows that can give or deny. To that extent we would expect some fall in the number of incidents involving upper bureaucracy too, though not an end of them. But corruption by politicians in power-- kickbacks for public purchase and illegitimate use of public funds-- obviously cannot be eliminated through economic reform. It needs to be

[13] It is difficult to speculate on a time frame, though. So far e-governance projects have relied on individual leaders at the state level or visionary technocrats at the centre. It can become a self-propelling movement only if politicians spot gains from it for themselves. The example of Mr. Chandra Babu Naidu, might have sent a wrong message-- that there are better ways of mobilising votes. A stronger possibility is e-governance introduced piecemeal by the upper bureaucracy in their individual areas of discretion, for more effective organisation and management.

addressed by the political system: voters, governments, political parties and the Election Commission. Political development is beyond the scope of this paper. But in line with the above discussion, we can ask if ongoing reforms and ICT will have any influence at all.

Political corruption is more threatening in certain state governments. If in a certain state corrupt governments recur as a rule, rather than exception, it implies that voters do not punish corruption. Of many possible reasons, those relevant for our discussion are:

(i) Voters' preference for private income may be overwhelmingly greater than that for public goods. Corrupt politicians are preferred as they are expected to reward voters through private transfers from the public fisc.

(ii) Voters may vote according to historical loyalty unrelated to the current state of politics, and politicians invest in vote banks to keep the historic loyalty unshaken.

(iii) Under some assumptions, it is optimal for corrupt politicians to use corruption allegations for changing inter-party power equations, e.g. between ruling and opposition groups, but not to press for sentencing. In this case political corruption is often insinuated but rarely pursued to the end to establish the truth, leaving voters to form subjective beliefs. Those who wish to think that all scandals are just scandal-mongering, can think so without being challenged by facts. Others can believe that all politicians are corrupt, without again being challenged. It is also possible to continue to believe in the honesty of one's own leader in spite of allegations. The overall effect is that corruption allegations drop out of the equation and elections are contested on the basis of other factors.

(iv) Following from the above point, when the political process becomes mainly distributional, corruption becomes a means of distributing income between different groups.

The repeated interactions of this kind overtime result in corruption becoming an accepted norm.

It is reasonably certain that in the long run, market reforms will have several predictable effects on the first two factors discussed above. Increased geographical mobility and migration across the country can be expected to weaken traditional vote banks, which rely on the co-habitation of similar groups in an election constituency. Remarkably, this effect will be stronger in states where vote-bank politics is more entrenched, because those are the states with more severe poverty and disorder pushing for emigration. Secondly, voters who move across regions and settle down in new places will be much more aware of the quality and provision of public goods than has been the case so far. Third, the numerical growth of the middle classes will alter the income and education composition of the electorate and overall preference for public goods and governance over private transfers. Finally, the omnipresence of visual electronic media, itself a result of economic reforms, is expected to increase the level of awareness of relevant issues including inter-state disparities in economically backward constituencies. These changes are expected to cast positive influences on the political system.

Information and communication technology can contribute to this environment of change. It can equip the media and activists with technology to monitor and chase alleged political scandals and helping them establish the truth in all alleged cases. We believe that successful conclusions of these cases and sentencing when appropriate, could be important in removing the sceptic apathy of voters.

8. Conclusions

There are two strands of thinking about corruption. One believes that self-interest, that breeds corruption, can be itself harnessed to motivate people not to be corrupt. It requires either well-functioning and competitive markets, or appropriate contracts that force the parties to stay clean. For such law-abiding equilibria, an effective legal system has to stay in the background as a credible and serious threat. A second school believes that the ultimate solution to corruption is technological: to foreclose the possibility of taking a corrupt step.

Both schools may be theoretically right. It is possible to visualise a society-wide web of contracts that bind everyone in incentive-compatible clean behaviour. It may similarly be possible to visualise technologies that completely disable corrupt steps. For example if all voters are finger-printed and can vote into any of a system of computers stationed all over the country, the possibility of false voting, and booth-capturing become physically impossible. Or, if there is no paper money, and everyone were to receive or pay with plastic cards through a personal mobile fund-transfer gadget connected through satellites to the banking system, all unaccounted receipts could be traced with certainty.

But both types of solutions have resource costs, and so they will materialise only to the extent that someone is willing to pay for them. Secondly, those who would pay would not be paying for the moral cause of eliminating corruption. They would spend in order to cut their losses from corruption. Hence they would buy technology or legal services only to the extent that they cost no more than the corruption they reduce. Therefore in a private society, the solution to corruption is always partial. Corruption, that costs less than it would cost to eliminate it, is tolerated. In this paper we have examined how corruption may be affected by the reforms, and our ICT if applied. To the extent that corruption falls directly as a result of market reforms, it is a free of cost bi-product of the reforms. But all other solutions will materialise

only to the extent that private interests think worthwhile for cutting their losses. Hence we cannot make any statement about the extent to which these effects will proceed.

REFERENCES

Braudel, Fernand (1983), *The Wheels of Commerce.* London: Book Club Associates.

Patibandla , M (2005) *Evolution of Markets and Institutions*, Routledge, London.

Samuelson, P. A (1958), *Foundations of Economic Analysis*, Harvard University Press, Cambridge, Massachussets, 163-171.

Sanyal (2004), 'Bribes in a Supply Line', *Economica*, vol. 71, no. 1, February 2004. pp. 155-168.

Sanyal (2000), 'Audit Hierarchy in a Corrupt Tax Administration', *Journal of Comparative Economics,* Vol. 28, No. 2, June 2000, pp. 364-378.

Scitovsky, T (1942), The Political Economy of Consumers' Rationing, *Review of Economic Statistics*, XXIV, 114-124.

Swart, Koenraad W. (1980), *Sale of Offices in the Seventeenth Century.* Utrecht: H & S Publishers.

Theobald, Robin (1990), *Corruption, Development and Underdevelopment.* Durham, N.C: Duke Univ. Press.

The Policy Group (1985), *Estimates of Tax collection and Evasion in Response to the 1985-86 Budget. New* Delhi: The Policy Group.

Wade, Robert (1988), *Village Republics: Economic Conditions for collective Action in South India.* Cambridge/New York: Cambridge Univ. Press.