Case Study

Leveraging Technology for Financial Inclusion

September 2011

Governance Knowledge Centre

Promoted by Department of Administrative Reforms and Public Grievances
Ministry of Personnel, Public Grievances and Pensions, Government of India
http://indiagovernance.gov.in/

Researched and Documented by

oneworld.net
OneWorld Foundation India
www.oneworld.net.in
owsa@oneworld.net

Table of Contents

Researched and documented by
oneworld.net
OneWorld Foundation India

Executive Summary

With nearly 112 million Indian households with no access to formal credit, financial inclusion (FI) remains a key policy concern in the county. It figures centrally in the government's approach to the 12th Five Year Plan. However, in reality, the challenges to including remote, poor populations within the folds of formal banking and financial services have been manifold. Out of these, limited human resources and high transaction costs figure as the major ones that have led to the unsustainibility of FI initiatives in the country.

The Punjab National Bank's ICT for Financial Inclusion programme aims to undercut these challenges and make banking services reach the poorest, most excluded populations in India and exhibit that this can prove to be a profitable business model for the bank despite the perceived high costs involved. For this purpose, PNB has designed a technology backbone- a Business Correspondent (BC) model that relies on smart card based, offline transaction strategies. The model utilises the services of BC agents, a hand held device and smart cards for lowering entry barriers for customers. Technical safeguards like encrypted data transfers, disaster recovery modules and mutual smart card authentication have been put in place to ensure robust security in financial transactions, data recovery in case of accidents, and minimum number of instances of fraud. This report seeks to highlight the working of this model and evaluate the key benefits and challenges to the programme.

The programme currently includes 39 ICT-based FI projects in 14 states of the country, covering about 5400 villages. Nearly 74 lakhs 'no frills' accounts have been opened out of which 40.89 lakhs accounts are ICT based. As has already been proven with national level recognition for the model in the form of prestigious awards, it has serious potential to expand financial services to remote parts of the country and, at the same time, keep the transaction costs very low for the bank. The introduction of ICT tools has significantly reduced the manpower, infrastructure and manual paper work required. Its processes are streamlined and can be up-scaled to include far more number of customers than it does now. It also has the capability to be linked with national level social security schemes like the Public Distribution System, MGNREGS and Unique Identification (UID) to facilitate payments of wages and other benefits to the beneficiaries as well as ensure its own sustenance in terms of consumer demand.

Methodology

PNB's ICT for Financial Inclusion programme is unique in its use of technology for reaching the unbanked and under-banked sections of India's population. The in-house development of technology backbone, along with the security safeguards and business continuity techniques has given the programme a wide reach across India. The number of villages covered under the

programme has steadily been on a rise while the costs of operations have plummeted over years. These provide reasons to suggest that PNB's FI programme has provided a last-mile solution and seamless connectivity to the bank's aim of reaching out to its customers. The technology backbone has allowed for a high velocity of business transactions and enabled greater possibilities throughout the supply chain.

In order to verify best practice in extending financial services to India's poor, extensive desk research was carried out by the OneWorld research team. The research focused on generic issues and debates surrounding financial inclusion in India, RBI's 2006 guidelines for the same, initiatives taken by various banks in the country to implement their FI strategies and PNB's ICT for FI programme per se.

Owing to the unavailability of relevant officers for an extended period of time, no interviews were held with the PNB. This research, therefore, was partially challenged by the absence of first-hand information regarding programme implementation.

Background

The financially excluded comprise a significant section of the Indian population. The AIDIS 2002 survey1 estimated that 111.5 million households in India had no access to formal credit while 17 million were indebted to moneylenders. Further, lower the asset class or income, higher the degree of exclusion. These findings were confirmed by the Invest India Incomes and Savings Survey (IISS), 2007,2 which showed that only 32.8 per cent households in the country had borrowed from institutional sources while 67.2 per cent from non-institutional sources.

	Without bank accounts	Without life insurance	Without health insurance
Rural	59.59	68.30	98.58
Urban	36.67	45.40	94.72
All India	52.41	61.10	97.39

Table 1: Percentage of households in India without essential financial instruments
Source: IISS, 2007

[1] The All India Debt and Investment Survey (AIDIS), conducted by the National Sample Survey Organisation (NSSO) once in ten years, is the basis for estimating household sector capital formation in India.
[2] For details, refer to http://www.iimsdataworks.com/iiss_2007.html

The lower income categories and the poor are especially excluded from the financial market. For instance, only 34 per cent of the lowest income quartile had accumulated savings, with only 18 per cent owning bank accounts. In contrast, in the highest income quartile, 92 per cent had savings and 86 percent had bank accounts.3 Dealing with formal financial institutions requires certain pre-conditions to be met *viz.* awareness and appropriate information about formal institutions, financial literacy, effective financial services that cater specifically to the requirements of the financially excluded etc. In the absence of these conditions, households are compelled to avail of funds, often in times of emergencies, from informal sources at high interest rates, which eventually lead to indebtedness. The problem is compounded by the fact that a large portion of India's population is employed in the unorganised sector, owing to which they do not have access to employer-provided insurance and pension services.

This represents a tremendous opportunity for the banks in India to connect these large unbanked and underbanked masses with the formal financial system. Against this backdrop, financial inclusion (hereafter, FI)- taking the banking system to the doorsteps of the marginalized- addresses three major financial challenges faced by rural communities in India *viz.* access to financial services, affordability of such services and the actual utilization of these services. In 2006, the Reserve Bank of India (RBI) permitted banks in India to utilise the services of intermediaries like self-help groups/NGOs/microfinance institutions and other civil society organisations in providing financial and banking services through the use of Business Facilitator/Business Correspondent (BF/BC) model. Financial inclusion formed an important plank of the inclusive growth theme of the Eleventh Five Year Plan. Despite this, the challenge of financial inclusion in India is formidable- six lakh villages and 85, 393 branches of commercial banks.4 At the same time, it offers huge opportunities for the national economy to grow at a rate of 9 to 9.5 per cent during the Twelfth Five Year Plan.5 On the basis of the Rangarajan Committee recommendations, RBI encouraged the banks to use ICT solutions for enhancing the outreach with the help of BCs.

In keeping with these recommendations, most of the nationalised banks in India initiated policies to make their banking services reach the marginalised sections of Indian population. Innovative ICT approaches have been adopted by both government and the banks to reach out to these unbanked populations on payment systems. Punjab National Bank's *ICT for Financial Inclusion* programme is unique owing to its expanse in terms of geographical area and

[3] IISS, 2007
[4] Biswa Swarup Misra. 'Make the new banks go rural'. *The Hindu Business Line.* 31 August. 2011
[5] Pranab Mukherjee. *Challenges and Opportunities in a Trillion Dollar Economy.* National Banking Conclave. The Associated Chambers of Commerce and Industry of India. New Delhi. 17 June. 2011

functional creativity. All its financial services are provided through information and communication technologies backbone. PNB has designed its own delivery channel using smart card technology along with biometric features.

Objective

Punjab National Bank's ICT for Financial Inclusion programme aims to make banking services reach the unbanked populations in India, thereby proving that catering to this segment of people provides for a profitable business model.

Programme Design

PNB's business model is designed to expand its reach to unbanked and under banked regions and people. It consists of (a) a **brick and mortar model** that is branch-based, and (b) an **ICT-based model** that is branchless. While the former has also produced significant results, this paper focuses on the ICT-based model owing to its innovativeness and potential.

Key Stakeholders

The ICT model for FI includes mainly four stakeholders- the Punjab National Bank, the Technical Service Providers, the Business Correspondents and the customers.

The model is the brainchild of PNB and the technology backbone for the same has been developed by the bank. Like in branch-based banking, all customer data rests with the bank and only it can authorise any transactions to take place at the field level. The bank, from time to time, partners with institutions like the Indian Institute for Banking and Finance to provide and upgrade the capacities of its employees.

PNB currently works with 10 TSPs; the latter are responsible for the provision of software for the programme. For instance, Infosys has provided the Finacle inclusion solution that provides the framework for the entire model.

The Business Correspondents are entities that train and send their agents to carry out the bank's work in the field. The BC agents are the ones who handle the HHT, approach potential customers, enrol new ones, and carry out the day-to-day transactions for them at their doorsteps. The BC agents are crucial to the functioning of this model.

The customers of PNB's FI programme are mainly the beneficiaries of the programme. These are mostly the people who belong to remote villages in the country and for whom formal banking services had long been inaccessible.

Process Flow

The programme's branchless banking model relies on Business Correspondents (BC)/Business Facilitators (BF) and smart card-based technology solution. Following are the main components of the programme design:

- Business Correspondents/Facilitators
- Hand held offline device (enabled with biometric facility)
- Smart cards (32k/64k memory chip) for financial transactions

Business Correspondents/Facilitators

In keeping with the RBI guidelines for financial inclusion programmes, PNB appoints BCs/BFs to act as agents of the bank in sourcing new accounts and performing transactions at the doorsteps of the customers. As of March 2011, the bank was utilising the services of 2965 BC agents and 1633 BFs, drawn from 21 bodies identified for the purpose. It is the responsibility of the bank to carry out due diligence exercise in selection of BCs/BFs6, to cover aspects such as reputation/market standing, financial soundness, management and corporate governance, cash handling ability, and ability to implement technology solutions in rendering financial services.7

The types of transactions undertaken by BCs are determined as per the Guidelines on Para Banking issued by the RBI from time to time. The BCs are attached to one identified branch of the bank in the operational area, generally referred to as the base branch. Adherence to KYC norms is ensured by this branch. The BCs function only within the operational area specified ensuring the distance criteria and other guidelines of regulators.

Technology utilised

The model is an **offline transaction model**. The two major technological components involved are the *hand-held offline device* through which financial services are offered to the customers and the *smart card* (32k/64k memory chip) provided to each customer for recording of transactions. Along with these, the BC uses an Account Opening Form (AOF) and a laptop for feeding customer data, a digital/web camera for capturing customer's photograph, and a biometric device for recording customer's finger prints.

---

[6] The following individuals can be engaged as BCs/BFs: (a) individuals like retired bank employees, retired teachers, retired government employees, authorized functionaries of well run SHGs, Common Service Centres etc., (b) NGOs/MFIs set up under Societies/Trust Acts and Section 25 companies, (c) Cooperative Societies, (d) Post offices, and (e) Companies registered under the Indian Companies Act, 1956, excluding Non Banking Financial Companies.

[7] Government of India. Reserve Bank of India. *Guidelines for engaging Business Correspondents (BCs).* 28 September. 2010. Web. 26 September. 2011. <http://www.mit.gov.in/sites/upload_files/dit/files/DIT%20-%20RBI%20Circular%20Business%20Correspondents.pdf>

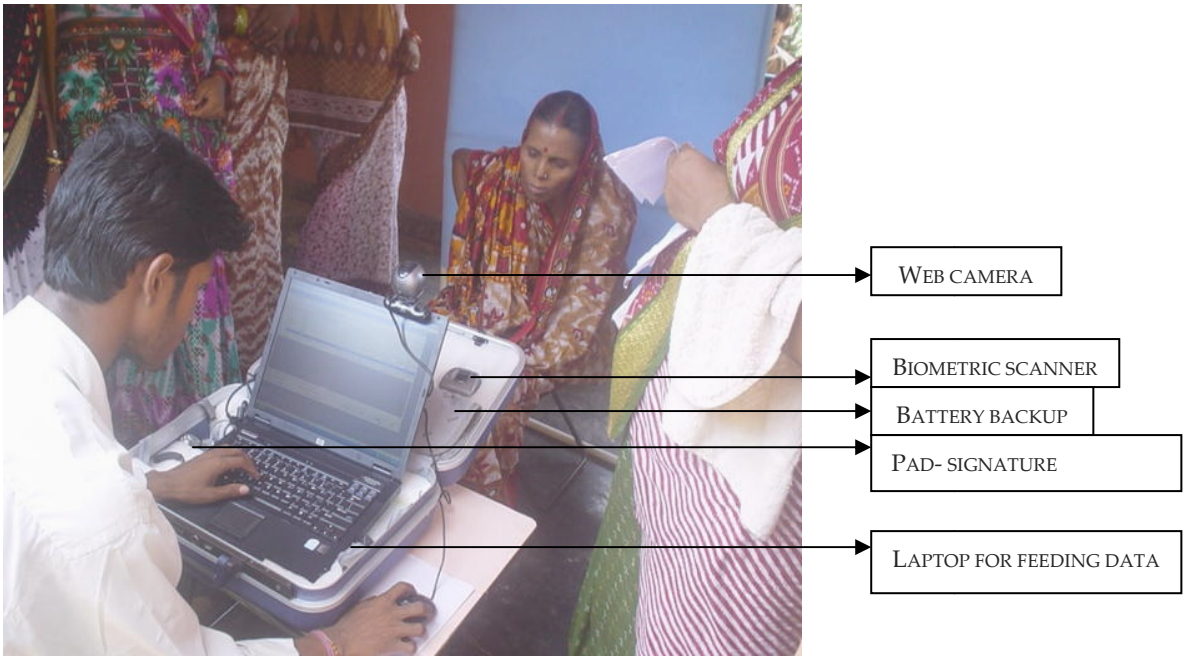

Figure 1: Technology utilised for the ICT-enabled financial inclusion programme

The biometric capturing is done for both index fingers at the time of enrolment even though only one index finger's print is required for the activation and further use of the smart card. The technology used by the BC is provided by the Technology Service Provider (TSP) identified by the bank. As of now, the bank works with 10 TSPs.

The electronic data (customer account details) are transmitted to the bank's Core Banking Solution (CBS)8 server (FINCBS) at the data centre with Finacle9 application. FINCBS server can support all the CBS functionalities and stores all the data relating to FI customers as per their accounts.

A copy of the AOF with due authentication of the base branch is transmitted to the FI back office- currently 8 in number- established for the purpose. The FI back office is responsible for data accuracy, transfer and reconciliation. On confirmation of account opening by the FI back

[8] CBS is networking of branches, which enables customers to operate their accounts, and avail banking services from any branch of the Bank on CBS network, regardless of where he maintains his account. The customer is no longer the customer of the branch but that of the bank.

[9] An Infosys innovation, Finacle inclusion solution can interface with any CBS directly or indirectly through an industry standard middleware. Hosted on a Java 2 Enterprise Edition (J2EE) platform, it enables customers to access their accounts through a BC network. The bank's field staff and extended correspondent network, is in turn enabled to support customer registrations, cash transactions and service both inquiries and requests. Finacle arms banks with a two way messaging infrastructure to alert field agents and bank staff through SMS. This is supplemented by a secure mailbox. The solution also has extensive offline transaction processing capabilities, supported by a robust synchronization engine.

office, customer details are communicated to the TSP. The TSP then prepares the account holder's customised smart card- consisting of a photograph, banking products and biometric data- and is distributed to the FI customer through the BC.

The consolidated balance of FI accounts under the head SBFIN is reflected in the respective base branch GL head. The consolidated transaction is posted from FINCBS to CBS servers by FI back office.

The complete system is secured with symmetric key based Key Management System (KMS), owned and managed by the bank, as per the Institute for Development and Research in Banking Technology's (IDRBT) standards for FI. The key features of the KMS include a mechanism for authentication of the smart card at the field, encryption of the biometric data stored on the smart card, mutual authentication between the BC smart card and the customer card, and a disaster recovery module to meet the challenge of any failure at the data centre.

The *Hand Held Device* (HHT) is used by the BCs for capturing financial transactions. It supports all the products offered by the bank. Financial transactions through the HHT are completed only after authentication of BC's smart card and customer's smart card followed by biometric authentication. On completion of any transaction, the HHT prompts the transaction amount and the resultant balance of the customer in local language. An instant receipt is generated by the HHT, which also has the facility for printing out the receipt, and handed over to the customer. Data transmission from the HHT to the FINCBS is done in an encrypted form for additional security of customer data.

Figure 2: Hand Held device (HHT) printing a receipt

A *smart card* is a wallet-sized card, embedded with an electronic chip, working as the customer's 'electronic purse'. The card memory varies from 32k to 64k and it holds different pockets for different banking products along with the smart card application and secure storage of data. Each smart card is identified by a unique smart card number and the customer id of account holder. Both BC and customer are issued a smart card. The BC's smart card is

used for authenticating the Point of Sale (POS) machine, establishing connection with the intermediate server for BOD (Begin of Day), EOD (End of Day), data transfer and to prevent the misuse of the POS machine. No transaction can go ahead without the BC card.

Business Continuity Plan (BCP)

- Due consideration has been paid to include safeguards in the FI programme model for ensuring its continuity in the face of occasional technical, situational or human resource challenges. These include:
- In the occasion of customer finger prints failing to match, the BC can manually perform the transaction. Such a transaction is controlled through the HHT and a new smart card is issued in case of persistent failures. A customer wise and day wise limit is set by the bank for such transactions.
- A copy of the transactions is also stores in the BC card. Hence, in case the HHT is lost or misplaced before data is uploaded on the server, the data can be retrieved from the BC card.
- In case the HHT and the BC card are both lost or misplaced, a second copy of the receipt with the BC is sent to the FI back office and the transaction is created in the FINCBS.
- If the BC fails to turn up or approach the customer, an alternate BC is sent to the village. The customer card is read, the transaction retrieved and uploaded to FINCBS after validation.
- If the customer loses his/her smart card, a new card is issued with the help of the data already available with the bank.
- A weekly reconciliation is carried out between the bank's account and the BC account to crosscheck the customer information.
- For cash management, the BC maintains a main account with the bank. The bank provides cash to each BC within the limit. The cash held against with the BC is insured for loss and fidelity. The BC is required to remit the net amount and the data to the bank at least once in 48 hours. The HHT application does not permit further transaction without sync with the TSP server.

Capacity Building

A training programme titled 'Train the Trainer' by the Indian Institute of Banking and Finance (IIBF) has been used for training the officials involved in the bank's FI programme. The training programme has four components:

Training to BC agents: This includes on-location training programmes for BCs, training related to the bank's products and services, and technology related training by the TSP.

Financial Literacy Counselling Centres (FLCCs): 58 FLCCs have been established for spreading financial literacy among people. Rural libraries have been set up for dissemination of information in remote rural areas.

Farmer Training Centres (FTCs): These have been established under PNB Farmers Welfare Trust to provide customised training to local farmers.

Rural Self Employment Training Institutes (RSETIs): Total 30 in number, these have been established by the bank for organising employment generation-oriented training programmes.

Financial Costs

Currently, the bank is working on 46 projects in total, including the non-ICT enabled ones. The projects were initially undertaken as pilot projects with different TSPs. The initial cost of the FI services through such products was quite high- INR 12-14 lacs per pilot project of 5000 smart cards within a time period of 6 months, that is, INR 240 per smart card. With an increase in the customer base, the cost came down to INR 140-180 per smart card in the first year and to INR 62-65 in the second. This cost includes the TSP charges and the BC costs. However, it does not include the bank's cost for establishing the technological backbone for providing FI services.

Impact

As of March 2011, approximately 74 lakh 'no-frills' accounts had been opened under the PNB's FI programme, amounting to a business turnover of INR 1,00,342 lakh. Out of these, 40.89 lacs accounts were ICT based while 32.44 were brick and mortar model based. Out of a total of 46 FI projects running in 17 states, 39 projects were ICT projects that covered 14 states of the country. The ICT model covers 2186 villages with a population of less than 2000 and 3219 villages inhabited by more than 2000 people each.

Projects	**Number**	**States**
Projects in rural areas	28	Bihar, Rajasthan, HP, Uttarakhand, UP, Punjab, Jharkhand, MP, Orissa, West Bengal
Projects in urban areas	06	Punjab, Delhi, J&K, Chandigarh, Bihar
NREGA/Social Security	05	AP, Haryana, UP, Chattisgarh
Total (ICT projects)	39	**14 STATES (Indo Gangetic Plains) + Andhra Pradesh**
Project 'Bhamashah'	01	Rajasthan
Credit Driven Projects (Non ICT)	06	UP, Chhatisgarh, North East, Bihar , Karnataka
Grand Total	**46**	**17 States (14 in Indo Gangetic Plain + AP, Karnataka and North East)**

Table 1: Major Finanacial Inclusion Projects of PNB
Source: PNB, March 2011

The PNB's FI programme has done impressively well in terms of third party assessments. The Government of India, under the award category of 'Innovative use of ICT by PSUs for Customers' Benefits', awarded PNB the *E-Governance Gold Award 2010*. The programme also won the *Special Technology Award for Financial Inclusion* by IDRBT for the 2008-09 and 2009-10 successively as well as the *Skotch Award* for 2010.

Key Benefits

The introduction of a variety of ICT tools in the FI programme has demonstrated tangible benefits, the key among which are enumerated below.

Cost effective business model

The bank has been able to reach to gain access to a new customer segment and cash in on rich hitherto untapped deposit bases, by setting up a low-cost channel to bank the unbanked.

Ease of operation

Under the ICT model, the bank has set up a system to enrol customers offline, even in the absence of internet connectivity. This is enabled through easy to use devices such as laptops. The spot-registration process is an innovative approach that supports both smart card and simple ID card based banking- this has helped reduce the time required to on-board a customer and lowered entry barriers. The entire ICT system can be easily handled by BCs.

Robust security

Fingerprint-based biometric authentication ensures the fidelity of every transaction performed. Along with this, there are inbuilt safeguards in the model like URL encryption, session management and such like to provide a reliable security framework.

Cost savings

The ICT model is inherently independent of the network service provider and negates the need to build a business model that involves costs and profits sharing with them. This translates into significant cost savings for the bank without the bank having to compromise on features or the range of devices supported.

Client value

The ICT model has been designed in a way to provide a flexible and differentiated service to the unbanked. It includes support for local language wherein transaction confirmation messages are voiced in the local language. Fingerprint-based biometric authentication has helped overcome the barrier of illiteracy that is even more rampant among the poor in the country.

Challenges in Implementation

Efficiency of IT vendors

The BC/BF model was introduced with the launch of pilot projects with each project having a minimum mandate of issuance of 5000 smart cards within a period of 6 months, covering 10 to 15 villages. These projects were up-scaled as the bank gained experience and the programme's popularity grew. However, the performance and efficiency of the IT vendors has not been uniform. The obvious solution for this is to acquire services of another IT vendor but given the requirement of interoperability of smart cards, this proves difficult.

This challenge is even bigger considering that there is *dearth of TSPs* in the field that provide smart card based technology like ALW, FINO, Integra, HCL, TCS and such like.

BC and TSP convergence

Presently, the bank is utilising the services of 10 TSPs and 21 BCs. The RBI guidelines mandate that a variety of entities can serve as BCs but in reality the BC work is generally done by Section 25 companies floated by the TSPs. PNB's experience has shown that where the BC and TSP are different, the project has often not taken off. This creates the problem of necessarily maintaining the monopoly of a single service provider.

Business Correspondents

BC agents work under the aegis of the BC entity and the bank has no direct control over them. Some of the BC agents are poorly remunerated by their companies and, thus, are disinterested in discharging their duties efficiently. Frequent changes in the BC agents affect the reliability of the project and the customers suffer as well. If the BC agents do not move frequently in the fields, the number of transactions remains low. Often the agents are not well-versed in the products and services offered by the bank and are unable to guide customers appropriately.

The Way Forward

With improvements in network connectivity, the bank plans to implement an online transaction model along with the two existing models of operation. Web-based kiosks and mobile-based model at the villages are also in the pipeline. There is space to introduce 'combo cards'- smart chip with magnetic strip) to enable payments through ATMs. The most significant push to the programme is likely to come from the Unique Identification (UID) programme, Aadhaar- a national project to give every India resident an exclusive digital identity. It is proposed that while enrolling for an UID, citizens can indicate that they need a bank account. According to media reports, in Temli (Maharashtra), where the UID project was launched,

approximately 1500 people were enrolled out of which nearly 97 per cent wanted a bank account. Individual data gathered by Aadhaar can prove sufficient to meet the KYC requirements of banks.

Conclusion

The ICT for Financial Inclusion programme has helped PNB to gain access to a new customer segment and had reduced operation, maintenance and deployment costs. The challenges that the programme currently faces are not the type that would permanently debilitate the programme. With some micro improvements and adjustments, these challenges can be effectively taken care of.

The PNB offline FI model has the potential to be replicate din order to offer doorstep banking services in remote rural areas where last mile connectivity is still a challenge. Credit delivery through smart card model can be implemented to reach a larger section of the society at low transaction cost to the bank. The model can be integrated with national and state level schemes like the RSBY, Public Distribution System (PDS), payment of social security benefits and wages to workers under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and such like.

Research was carried out by the OneWorld Foundation India (OWFI), Governance Knowledge Centre (GKC) team.
Documentation was created by Research Associate, ***Aditi Dayal***
For further information, please contact Naimur Rahman, Director, OWFI at owsa@oneworld.net

References

- Government of India. Planning Commission. *Approach Paper to the Twelfth Five Year Plan.* August 2011
- Government of India. Economic Advisory Council to the Prime Minister. *Economic Outlook: 2011/12.* New Delhi. July 2011
- Government of India. Reserve Bank of India. *Guidelines for engaging Business Correspondents (BCs).* 28 September. 2010. Web. 26 September. 2011. <http://www.mit.gov.in/sites/upload_files/dit/files/DIT%20-%20RBI%20Circular%20Business%20Correspondents.pdf>
- Misra, B.S. 'Making the new banks go rural'. *The Hindu Business Line.* 31 August. 2011. Web. 5 September. 2011. <http://www.thehindubusinessline.com/opinion/article2412579.ece?homepage=true>.
- Pranab Mukherjee. *Challenges and Opportunities in a Trillion Dollar Economy.* National Banking Conclave. The Associated Chambers of Commerce and Industry of India. New Delhi. 17 June. 2011