Improving Financial Inclusion Through Atms Installation Towards Sectorial Balance & Sustainability

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Abstract: This paper aims to improve the penetration of account holders in rural India for financial inclusion under the PradhanMantri Jan DhanYojana (PMJDY) by the mechanism of diversifying the already installed Automatic Teller Machine (ATM) which are underutilized in certain location of Urban area owing to less than optimum threshold of number of hits per day for sustainability & operation of ATMs resulting in huge financial loss to the bank and government infrastructure expenditure. Thus a mechanism has been devised to diversify the underutilized ATMs to such a location where installation of these ATM increases the convenience, confidence & penetration of account holders for people in rural India. Thus, different parameters of diversifying an ATM such as number of prospective account holders, potential area (location) and percentage of literacy rate were taken to analyze the installation of diversified machine which was earlier used in urban location resulting in identifying the optimum number and locations of ATM so as to ensure an equitable distribution of ATM within a geographic region in rural India.

Keywords: ATM, PradhanMantri Jan DhanYojana, Diversification, Optimization.

Introduction
ATM is an automatic teller machine which is used to save the cost and accessibility of a bank by satisfying customer needs or demand for money anytime, anywhere[4]. Initially the use of ATM was restricted to withdrawing money, checking balance and printing of mini statement but now apart from these some others facilities are also provided like payment for goods and services purchased online,depositing cash, checks, and paychecks at an ATM machine,withdrawing local currency at a foreign bank's ATM machine at a fair exchange rate etc[3]. Considering the use of ATM's nowadays it is seen that the number of ATM's, which stood at a little over 27,000 as at the end of March 2007, has increased to over 1.6 lakhs across the country by the end of March 2014[1]. Apart from the above,the PradhanMantri Jan-DhanYojana (PMJDY) which[5] is a scheme for comprehensive financial inclusion is turning out to be an opportunity for installing more number of ATMs in rural India in the next few years. This diversification of ATMs in a proper geographical area of rural India will help in improving the financial inclusion.

Statement of Objective
The objective of the paper is to diversify the underutilized existing ATMs of urban region to the rural region which calls for its need of installing along with its proper and equitable distribution within that region which ultimately in turn, will help in financial inclusion.

Why Diversification of ATMs???
Diversification can be defined as spreading of the available funds on different types of reserves, such as commodities, properties, securities or services[6], or in other words it is spreading of a bank's possessions or loans over a broader range of quality borrowers, to maintain or improve earning levels while maintaining the same level of exposure[2]. In general, it can also be defined as shifting of services to a place where they are needed and where they can be utilized up to maximum. Financial inclusion can be defined as delivery of banking services at an economical cost to the vast sections of low income group. Diversification of ATMs, here means, shifting of ATMs to a location or to a place where they are needed and where they can be utilized properly so as to improve the financial inclusion and support sustainability. It has been seen that there are many ATMs in the urban region being underutilized which means they are not being used up to a optimum level. So, diversification of these ATMs from urban region to rural region will help in proper utilization of ATMs which ultimately will contribute in maintaining the operational cost on ATMs as well as in capital formation.

Factors of Diversification
Based on the literature review we found that following parameters will be needed for diversifying the ATMs:
1. **Number of Account holders: -** As the number of account holders in any particular area will increase there will be a demand for more numbers of ATMs in that area.
2. **Potential area:-**Potential area means those areas which have high gathering of people as compare to normal areas such as hospitals, school, colleges, court etc., and these types of areas always facilitate the need of ATMs.
3. **Number of hits per day: -** To make any ATM viable every bank decides minimum number hits (transactions) per day on that particular machine.
    - If any ATM receives hits less than the threshold, it will be considered as underutilized ATM.
    - If any ATM receives hits more than the threshold, it will be considered as over-utilized ATM.
4. **Literacy rate:-**Percentage of the population of age seven years or above who are capable of reading and writing with understanding.

With the data of literacy rate it can be calculated that how many account holders in any particular area are able to operate an ATM which will affect the installation of ATMs in that area.

Benefits of diversification in financial inclusion

Diversification of ATMs from urban areas to rural areas will be beneficial in various perspectives, some of these may include:-

1. **Account holders**: -Diversification of ATMs from urban areas to rural areas will facilitate the account holders of rural areas with,
   - The convenience of accessing the ATM easily.
   - Building confidence
   - Penetration
2. **Banks:** - Diversification will help the banks by,
   - Eliminating the problem of underutilized ATMs in urban areas.
   - Increasing the number of account holders of that particular bank exponentially.
   - Reducing the operating cost.
3. **Government:** - Government will be able to,
   - Generate more capital recovering the loss which the government was incurring in infrastructure expenditure.
4. **Society:-** The diversification or shifting of under-utilized ATMs will,
   - Improve the sectorial balance between the urban and rural areas.
   - Assure sustainability.

Data Analysis, Calculation and Result

A region with a population size of 1,117,094 has been taken for the study. Primary data is collected by interviewing the executives of different banks of the same region. Based on the data collected some parameters were found on which the installation or diversification of a new ATM at any location depends. If these factors are not satisfied then it will not be possible to install a new machine or shifting an existing one from a underutilized place to where it is needed. The factors on which installation depends are,

- Number of account holders in that particular location
- Potential areas in that location
- Percentage of literacy rate
- A threshold of number of hits per day on each machine.

Based on these parameters, a mathematical formula has been derived which will find the optimum number of ATMs in any rural area and the exact location in that area where those ATMs should be installed.

a) Formula for finding optimum number of ATMs in an area

Number of hits in an area per day=(Number of literate account holders*Average number of transaction in a month per person)/30 Required number of ATMs in an area=Number of hits in an area per day/Threshold number of hits per day Where threshold number of hits per day are the minimum number of hits required for ATMs installation.

b) Formula for determining the location for installation of ATM in an area

For determining the location center of gravity method has been used.

$$C_x = \sum X_i / n$$
$$C_y = \sum Y_i / n$$

Where,
C_x = abscissa for the new location of ATM
C_y = ordinate for the new location of ATM
X_i = abscissa for the location of the account holders of that area
Y_i = ordinate forfor the location of the account holders of that area
n is the total number of locations of account holders in that area

Using the above formulae optimum number and location of ATMs for both rural and urban area will be calculated, based on which the diversification of ATMs will be done wherever required, i.e., if the ATMs in any urban area are under-utilized then they will be diversified to the rural area.

Conclusion

As proposed in PradhanMantri Jan DhanYojna , a scheme of Financial Inclusion, it is seen that approximately 13.68 Crores of accounts have been opened till now , maximum of which are from rural India. So this calls for installing an appropriate number of ATMs in order to cover or make it accessible to large number of account holders. Diversification of ATMs from urban region to rural region will help the different sectors of the society in various aspects. Some of these include,

- Maximum utilization of ATMs.
- Delivery of the promised value i.e. value proposition through financial inclusion.
- Capital formation, which in turn will take the society and nation towards increased national income.

Acknowledgement

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