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Department of Economics
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Staff Advisor's Note

It gives me immense pleasure in writing this note for the first issue of Ramjas Economic Review. A little bit of history is in order here. The Department of Economics, Ramjas College started the "Journal of the Economics Society, Ramjas College" as a place where undergraduate students of the department and outside could showcase their original research as opposed to the then very popular departmental magazines which were more eclectic in their content. It is thanks to the efforts of the earlier batches of the students of the department that such an idea of a serious undergraduate journal bore fruit and has gained acceptability across economics departments of various colleges under University of Delhi and outside.

After four issues of "Journal of the Economics Society, Ramjas College" (available at: *https://ramjasjournalofeconomics.weebly.com/*), this year we have started a new venture and renamed the journal as "Ramjas Economic Review". All the shortlisted entries have gone through a double review by faculty of University of Delhi and a plagiarism test based on which some of the entries have been accepted after resubmission by the author(s). We plan to get an ISSN registration for the journal soon.

The members of the Editorial Board have put in immense efforts in initial shortlisting of the fifty plus submitted entries, editing and in bringing out the first issue of the journal that has tried to maintain the highest ethical standards of journal publication. I take this opportunity to congratulate them and express my deepest gratitude to the faculty members who reviewed the shortlisted entries. I hope as young researchers and students of economics, you find the entries in this issue interesting and challenging. We look forward to your feedback and encourage you to contribute to subsequent issues of the journal.

Mr. Alok Dash
Staff Advisor
Ramjas Economic Review

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ISSUING BODY

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Editor-in-Chief's Note

It brings me immense pleasure inexpressible, to present the foundational edition of Ramjas Economic Review, i.e. the undergraduate peer-reviewed economics journal of Ramjas College, University of Delhi. I hope, that the readers while reading through the journal will be bewildered, as to how an undergraduate journal can set such high standards of excellence, that too in its foundational edition. Well, your contentions are well deserved and we are not naïve enough to harbour any misconception regarding the superiority of our capabilities. What you see, is a byproduct of a legacy that has been carried forward by the students and faculty members of Department of Economics, Ramjas College for almost two decades now, and without any speck of doubt it deserves a mention here. It all started, in the academic year 2001-2002 when the Department of Economics came up with an idea of starting an annual economics magazine entitled "The Budding Economists", with a vision that it will provide a platform for undergraduate students to explore the subject matter of economics beyond their textbooks. Owing to the success of this venture, the department planned to take it to a next level with the publication of "Economics Journal" in the academic year 2004-2005, which marked the first time that students from other colleges started contribution for our journal. In the academic year 2005-2006, the title "The Budding Economist" was reinstated, replacing the "Economics Journal" on the demand of the then Editorial Board. The journal ran successfully till the academic year 2011-2012, but then due some contingent circumstances this venture came to a halt. But, time failed to diminish this legacy and in academic year 2014-2015 the journal was revived under the name of "Journal of the Economics Society, Ramjas College" which was one of its kind in the entire University of Delhi at that time; with some of the finest papers, articles, analytical reports and book reviews related to the discipline of economics being published in it year after year, students from prestigious institution in foreign countries like Afghanistan, Bangladesh, Bhutan, Nepal, Pakistan, Sri Lanka also got their papers published in this journal ; the revived journal ran successfully till academic session 2017-2018.

Ramjas Economic Review, in its essence is a revamped version of all its erstwhile predecessors. This foundational edition has been deeply inspired by the success of former venture and has tried to make their shortcomings insignificant. What it offers is a whole new vision for future editions, and a goal of making Ramjas Economic Review one of the best undergraduate economics journal in India. I am proud to assert that, in this foundational edition we have been successful in realizing our goal to a great extent. We received a large and diverse pool of entries from enthusiastic undergraduate students from some of the finest institutions throughout India. The selection process was highly competitive and not selecting some entries was a tough decision. I would like take this opportunity to congratulate the author(s) whose paper got published, after a plagiarism test and two rounds of

review, and would like to thank them for their cooperation with the Editorial Board throughout the entire process. I would also like to thank author(s) whose entries could not make it to the final publication for the enthusiasm they showed towards our journal.

This journal, which has finally seen the light of the day after a hiatus of one year, is a collective effort of many people. I owe deep gratitude to Mr. Alok Dash, Staff Advisor, Ramjas Economic Review who facilitated the working of the Editorial Board and took initiative to help us in every way he could. Dr. Apoorva Gupta deserves a special mention here, without her help, the coordination between the Department of Economics and Editorial Board would have been unimaginable. I would like to thank Dr. Deb Kusum Das, Teacher-in-Charge, Department of Economics, Ramjas College for ensuring full support on behalf of the department towards the journal. I profusely thank all the faculty members of the department for helping us throughout.

The excitement of the Editorial Board members did not allow a single dull moment to creep in during the entire year while the pertinent work was being executed. I am thankful to Samiran Dutta, Deputy Editor-in-Chief, Ramjas Economic Review, for providing me perennial support throughout the year in managing and conceptualizing the entire working of the Editorial Board; without his professional designing skills the success of this project would have been seriously downgraded. Fizza Suhel and Vrinda Saxena deserves a special mention here, the professionalism demonstrated by them while undertaking any and every task, as Editors, is something which is very difficult to emulate. Lastly, I want to assert, that seeing Tanvi Vipra and Samvid Uday undertaking their duties as Editors constantly reassured me of the fact that the future of our journal is in safe hands.

Anindya Tomar
Editor-in-Chief
Ramjas Economic Review

ABOUT

Ramjas Economic Review is a peer–reviewed academic journal for undergraduate students to showcase their research pertaining to the discipline of economics. Our mission is to provide a channel through which students can publish their scholarly findings to share with the research community at large. Though we are largely an undergraduate-run publication, we work under the guidance of the faculty of University of Delhi, especially during the peer review process.

DISCLAIMER

The opinions expressed in this journal belong to the contributors and do not necessarily reflect the viewpoints of the Editorial Board or the Faculty Review Board of Ramjas Economic Review.

IMPACT OF RAPE INCIDENTS ON FEMALE LABOUR FORCE PARTICIPATION RATE

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Female labour force participation rate (FLPR) has been historically low in India and surprisingly, has been declining over the past few years. It has fallen from 36% in 2005-06 to 24% in 2015-16, as per the Economic Survey of India 2017-18. One important, and often ignored, explanation for these trends in the Indian context is the high prevalence of crime against women. The incidence of rapes — marital or otherwise — has been on a rise in India in the past decade (Government of India, 2017), so much so that India is now infamous for being the 'Rape Capital' of the world. The question that then arise is, if there is a strong causal relationship between such events and their aftermath? Does the prevalence of sexual crime against women constraint them financially or professionally, making their contribution to growth smaller compared to their male counterparts? Rising per capita income levels notwithstanding, the increasing cases of sexual abuse do have a negative impact on the workforce participation by women, thereby hindering the economic growth and development of the country.

The economic cost of rape incidents is very huge which has a large opportunity cost for any economy. The victims of rape bear large health and legal repercussions. Additionally, they suffer from a lifelong reduction in productivity which constrains the country from reaching its potential (Peterson et al., 2017). These costs, though large, are not restricted to the immediate victims; rather, they spill over to the overall female population of the country. Living with the constant threat of abuse, females have to take precautionary measures, staying at home for instance, in order to prevent getting victimised. These measures, unfortunately, can also prevent them from attaining desirable education levels (Bowen and Bowen, 1999; Schwartz and Gorman, 2003; Ceballo et al., 2004) or joining the workforce in some situations (Chakraborty et al., 2015).

1. WORK DECISIONS OF THE VICTIMS

Various short-term and long-term, physical and mental health problems are associated with rapes of women. Post Traumatic Stress Disorder, anxiety disorders and depression are not uncommon among the victims, with serious implications on the educational attainments and productivity of women in the workplace. Due to the mental trauma, they are usually unable to perform to the best of their potential, at least in the short run, which leads to the reduction in the wages earned by them (if they decide to participate in the labour force) (Sabia et al., 2013). Some women even quit working because of the emotional turmoil they go through — accruing to the mistrust they develop for strangers and the social exclusion and stigma they face. The outcome of this decision may, in some cases, be seen as good by individuals (for prevention is better than cure), however, the ramifications on the economy are enormous in terms of lost human capital and productive potential.

Having talked to a few victims, we have observed their tendency to get involved in the non-profit sector focussing on equality, social justice and generally raising awareness about the sexual assault. It is because of the compulsion they feel towards doing something which others did not do for them. However, this involvement in activities affects their professional trajectories by trading off the time that could have been used in more productive areas which directly add to the GDP of an economy.

2. RIPPLE EFFECTS ON THE SOCIETY

Apart from the impact on the work decisions of the victims, rape incidents also alter the behaviour of the overall population. Be it by the prospective female employees or the employers, sexual abuse effects the decisions made in the labour market.

2.1. Female Job Seekers

There has been a surge in the number of police reports for rapes recently. With awareness comes the perception of the crime. The perceived threat of crime against women is likely to have increased because of the extensive media coverage that has been seen in India after the horrifying Nirbhaya case. A constant perceived threat to their safety reduces the flow of women into the labour force to a trickle (Chakraborty et al., 2015).

Firstly, the possibility of getting sexually abused has a positive relation to the girls' absenteeism rate in schools.

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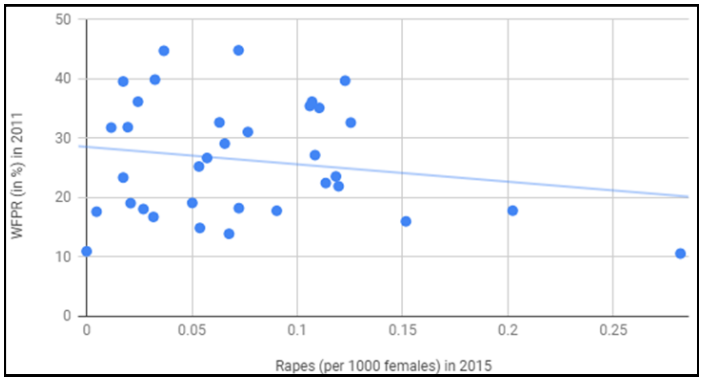
Bowen and Bowen (1999), Schwartz and Gorman (2003), Ceballo et al. (2004) have studied the negative effect of exposure to violence in the neighbourhood on attendance rates and education outcomes. This deterrent is even stronger in areas which are isolated, where children have to travel long distances in order to attend school or where the society has reservations about girls learning, let alone stepping out of their homes to go to school. This seriously impedes the development of human capital, which, in turn, reduces the employability and employment opportunities of these girls. And this doesn't end here. It gives birth to a domino effect of deteriorating human capital, as the off-springs of these girls when they become mothers, are shown to perform worse in attendance and academic achievements (Awan and Kauser, 2015).

Secondly, in order to prevent getting victimised, females may choose to stay at home or be reluctant to devote more hours to the workforce, especially in night shifts. In their recent research, Chakraborty et al. (2015) argue that the cost of participating in the workforce increases for the women when the perceived threat of crime against women is high and this deterrent effect is stronger in traditional societies where the chances of stigmatisation are large. This self– and many times socially– imposed restriction affects the type of occupations women find appropriate for themselves. This obviously prevents the economy to exploit the human capital it has while foregoing the potential innovation advancements it may have had.

The following scatter diagram plots the female workforce participation rate as a percentage of the female population (as per the Census data 2011) against the number of rape cases in different states and union territories in India during 2015 per female population in the region (as per the Census data of 2011). The relationship is clearly negative, implying the possible downward pressure rape incidents put on the work decisions made by the women.

***Figure 1**: WFPR (in%) vs Rape (per 1000 females) in the Indian States*



Source : Author's calculations based on Census 2011 data on female workforce participation rates and female population, and the data on state-wise incidents of crime against women in 2015 published by the National Crime Records Bureau, Ministry of Home Affairs.

2.2. Behaviour of the Employers

The employers are also aware of this reluctance of a large proportion of the female population to commit long hours at the workplace which makes the employers make an irrational value assessment of the potential of the female job seekers, a concept which has been much discussed recently. The employers expect all the female workers to be less productive just because of their doubts about their commitment to the jobs. In consequence, the wages or salaries offered to them are often less as compared to their male counterparts, as shown by Sabia et al. (2013) also. In fact, a new study by Bolotnyy and Emanuel (2018) shows how the unwillingness to accept overtime -shifts by female train and bus drivers lead to lower wages for women when compared to men. The aftermath of this discrimination is an underperformance by the female employees. This hypothesis makes an assumption that the actual work performance of the employees is positively correlated with the remuneration offered to them. With nearly half the working-age population falling prey to such notions of lower productivity, they have serious negative implications on the growth of all the sectors of an economy.

Thus, the ability of the prevalence of rape incidents to counter growth and development is overwhelming, especially in a developing country such as India, and must be addressed in order to curb its ability to put speed breakers on the road to success.

3. POTENTIAL SOLUTIONS

Building robust legal institutions may play a key role in curbing crimes against women and thereby, improving their labour force participation. Conviction rates and reported cases of rapes show a small positive correlation indicating that higher probability of conviction encourages the reporting of rapes, at the same time acting as a deterrent for the same (which could be a factor behind the small correlation). Making reporting of crimes easier, the prosecution and redressal processes faster along with greater awareness about the crimes and associated punishments is imperative. (Bandyopadhyay, 2018).

Improving the social status of women remains a big challenge in India's patriarchal society, but holds vast potential for positive change. A negative correlation exists between sex ratio, a proxy for the position of women in the society, and reported cases of rape. Gender pay gaps are more severe in Japan and South Korea than India, yet their female LFPR far outstrips that of the latter, notes Amsden (1989). One important underlying cause could be the stark difference in crime rates in these countries. Extensive awareness programs, reaching the nooks and crannies of the country, along with real-life examples of successful females, holistic education in schools and address-

ing these pressing issues, will go a long way in orchestrating a change. The media is also a powerful weapon, which can either amplify the distortions in the social mindset or play a huge helping hand in improving the same. The outcome not only depends on those who wield it but also the 'passive' viewers who can (and ought to) raise their voices whenever needed.

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ATTITUDES TOWARDS A LESS CASH ECONOMY

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Abstract

This paper analyses the consumers' attitudes towards cashless methods of payment. It aims to bring about the acceptance of such methods by looking at the actual usage pattern as compared to their preferences along with reasons for such behaviour. In addition to this, the effect of variables like gender, age, education and socio-economic class were incorporated in the study to understand different responses. The results showed that cash is still used for a greater number of transactions as compared to other methods. It also highlighted that preferences are a main factor in choosing payment methods. The authors arrived at these results by conducting a household survey in Delhi.

1. INTRODUCTION

In a less cash economy a higher percentage of transactions are carried out not by cash, physically, but by other digital methods or electronic devices. These methods include the use of instruments like debit cards, credit cards, mobile wallets like PayTm, Google Tez, UPI apps like BHIM App, SBI Pay etc.

Digital methods are being promoted worldwide because of the ease and convenience associated with it. They are quick and time saving for consumers as well as retailers. Cash can be stolen but a stolen or misplaced card can be easily blocked. In addition to this, digital means let you keep track of your spending and provide several offers. This is the reason why we expect to see that Indian consumers are slowly moving towards other methods.

Sweden is going to be the first country to become totally cashless in the near future. 80% of all transactions are done by digital methods, and debit card is the most popular instrument of payment. Cashless methods are so intrinsic to the economy that even vendors accept cards. Widespread adoption of cards, digitalization of bank accounts, setting up of internet infrastructure and outsourcing of printing and distribution of cash has contributed to this cashless economy in Sweden.

In India, enough stress has been laid on using cashless methods of payments after demonetization in 2016 as it served as a solution to the cash crunch. Although a shift is seen in the payment pattern away from cash, it is believed that there is still a long way to go. The few consumers who are beginning to use other methods do so because they are able to understand the convenience associated with cashless payments. However, many on the other hand are still counting on traditional payment method out of habit. This research maps the payment pattern of consumers and the factors affecting it. It focuses on the reasons why cash usage is still high and the perceptions associated with digital payments.

2. LITERATURE REVIEW

Ever since the government has started promotion of a cashless economy, several studies have been done in this area. Organizations like Better than Cash Organization, Visa and MasterCard are trying to popularize digital payments. According to G20 Report 2014[1], digital payments lead to increased transparency, lower cost, increased control, incentive to save, financial inclusion and security. Moody's Analytics study[2] found out that card usage add-

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[1] *World Bank Development Research Group, the Better Than Cash Alliance, and the Bill & Melinda Gates Foundation. 2014, August. THE OPPORTUNITIES OF DIGITIZING PAYMENTS.*

[2] *Moody's Analytics Study Findings. Payment Cards and Economic Growth: The Impact of Electronic Payments.*

-ed 0.8% GDP across emerging markets, compared to 0.3% for developed market. Despite these benefits, India still has a higher cash usage[3]. Digital payment methods like cards, mobile wallets, UPIs etc. are starting to show some usage, however, as shown in a study carried out by Bijapurkar, Shukla and Bordoloi, in 2014, it was concluded that card and cash existed alongside by choice. Although digital payment are more convenient, the awareness about their benefit is low and due to the wide cash usage in informal sector, cards were not accepted everywhere[4]. Other studies have also realized the low growth of digital payments in India. Bappaditya Mukhopadhyay [5] suggested that awareness about the advantages of cashless payments should be the first step in the right direction. He also found out that incentivizing payments into accounts would boost digital payments.

Our research focused on the level of cash and digital payment used and what factors could possibly affect it.

3. METHODOLOGY

The study was based on primary research conducted in the urban area of Delhi (North campus) and slum area of Delhi (Seelampur). Primary data was collected through individual interviews with the help of a questionnaire. It was a survey of 100 respondents representing various age groups, gender, education levels, income levels and digital literacy to study the reasons and attitude of digital usage. The main focus of the study was to understand barriers to usage of plastic money, people's cash handling behavior, particularly regarding day to day purchases of goods and services, including routine bill payments and work related activities. The final questionnaire was prepared after conducting and evaluating the pilot survey which was carried out on a smaller sample size. The field survey was divided into phases wherein pilot survey was followed by the main survey. The main survey was conducted in June 2018. Households were selected using random sampling. The primary survey included 50 respondents from North campus and 50 from Seelampur.

4. RESULTS AND DISCUSSIONS

4.1. FINANCIAL INCLUSION

The process of financial inclusion consists of seeking each household and offering their inclusion in the banking system. The main feature of the approach involves 'connecting' people with the banking system (Reddy 2007)[6]. This can be measured from ownership of bank accounts, digital methods of payment and usage of ATMs here. Observation of the sample showed that 16% of the respondents did not have bank accounts whereas 84% did. For ownership of digital payment instruments, debit cards are most popular followed by cheques and mobile wallets.

ATM has been used more frequently as compared to other digital payment methods. All of the 84 respondents having bank accounts withdrew money at some point. Out of these, 63 use ATMs for withdrawing cash making ATM penetration 75%. However, similar trends are not seen when it comes to other financial inclusion channels like wallets, cards, UPIs etc.

One important result is that even though 84% people have accounts, there is a significant difference in ownership of digital payment methods lying between 20-60 percentage points. There is still low penetration of mobile wallets, UPI and credit cards as shown in the figure.

Figure 1. *Bank Accounts*

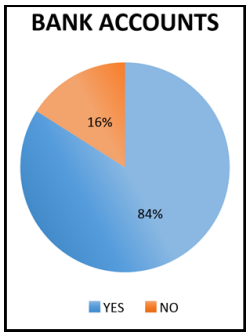
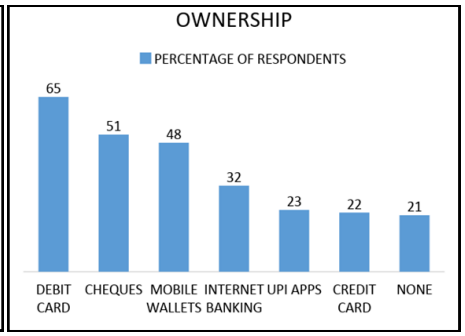


Figure 2. *Ownership of digital payments methods*



Source : Author's calculations based on survey data

Debit Card and cheque ownership is the highest among all instruments being 65% and 51% respectively. High proportion of debit card and cheque ownership is probably a reflection of the fact that most banks promote it at the time when account is opened. This means, it is convenient to get it. Secondly, nowadays ATM cards and debit cards are one and the same thing. Therefore, there is high possibility of owning debit card.

[3] *According to People's research on India's consumer economy (PRICE) Cash Survey- 2014, even card users made 73% of their transactions in cash and 17% using card.*

[4] Bijapurkar, Shukla, Bordoloi. 2014. REASONS AND ATTITUDES TO USING CASH IN INDIA.

[5] Bappaditya Mukhopadhyay. Understanding cashless payments in India.

[6] *Speech delivered by Dr. Y V Reddy, Governor, Reserve Bank of India at Bali, Indonesia on November 8, 2007.*

Mobile wallets, despite showing increased usage, are still low in proportion even though a significant amount of promotion has been done to publicize them. Considering the rate of advertisements, cashback offers and the push it received after demonetization, mobile wallet ownership should have been high. 48% respondents own it probably due to the convenient nature of these apps. The same reason should have been followed for UPI apps.

Internet banking ownership has still not reached significant numbers and is owned by 32% of the respondents. This could be due to the fact that general notion is that it requires usage of computers/laptop to carry it out. Moreover, it needs to be activated from bank branch at the time of getting one's account or later.

Credit cards are not achieving high numbers with 22% owning them because credit card marketing target the elite (PRICE Cash Survey-2014). They enforce "not meant for me" perception and hence they are not used by people in the lower sections of society. In addition to these reasons, main factors still come back to digital illiteracy and lack of knowledge and confidence regarding the various methods of payment.

Through the sample, we see that there is a significant difference between bank account ownership and digital payment instruments. This shows that even if a consumer is having a bank account, he/she is not necessarily owning digital methods of payment. However, in case of debit card, promotion by banks can be a reason for its high proportion.

Having observed ownership of digital instruments, we believe that it is important to study how these instruments play a role in carrying out digital payments. The next subsection tries to explain whether this ownership leads to actual usage of instruments. Different categories of expenditure like food, clothes, rent etc. (refer to appendix 2) were looked at to see what kind of expenditures are done using which instrument.

4.2. USAGE

By looking at the overall transactions for various consumption expenditures, it was observed that cash usage is as high as 76% of the total 1175 transactions. Following this is debit card which is used for 26% of the transactions. The other instruments' usage lies between 1% to 4%, thus making cash and debit card the two most important methods. At times an individual used more than one method and therefore the percentages would not add up to hundred.

It was not enough to study the usage pattern for all the respondents together. The possibility exists that there could be some variation for sub-categories of respondents. The important sub-categories which could influence digital payments are gender, age, education, digital literacy, socio-economic class and income.

The sub-categories are further explained below:

4.2.1. GENDER

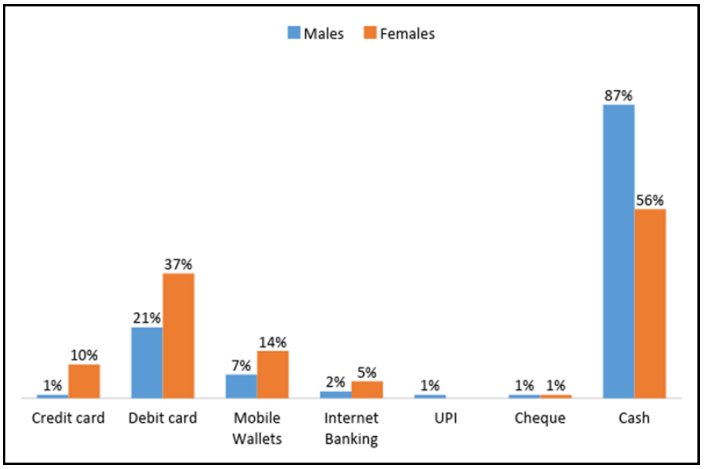
The existence of a gender gap in digitalization is not uncommon. The ownership of digital tools is unequal and so is the usage. The term "digital gender divide" is used to describe such inequalities in efficient utilization and accessibility of digital methods. This is due to reasons like hurdles to accessibility, lack of education and technological literacy, affordability, inherent biases and social norms.[7] Gender divide is seen in areas such as ownership of smartphones and financial inclusion as well. Women in rural areas are 72% less likely to own a smartphone and in urban areas are 63% less likely.[8] Disparity in financial inclusion exists because women still depend on their partners which leads to unequal representation in the labor force and less control over economic resources. When expenses and businesses are controlled by men, they have access to more assets which enables them to pay digitally.

Having said this, data showed that females used less cash as compared to males and more digital payment methods. Meaning, women used more digital methods of payments than men. Their cash usage accounted for 56% as compared to males which was 87%. Debit Card showed more usage by females with a difference of 16 percentage points and so did Credit card with a difference of 9 percentage point. Mobile wallets and internet banking also showed some difference with more females using it.

After exploring it further, all the women who used digital methods had some characteristics in common. They were all young, educated and belonged to middle or high socio-economic background. This led us to think that this pattern is not affected by gender and the characteristics mentioned before were responsible usage of digital payment methods.

[7] *Report by Organisation for Economic Co-operation and Development.2018.BRIDGING THE DIGITAL GENDER DIVIDE INCLUDE, UP-SKILL, INNOVATE.*
[8] *GSMA 2018.*

Figure 3. *Digital payment usage pattern-GENDER.*

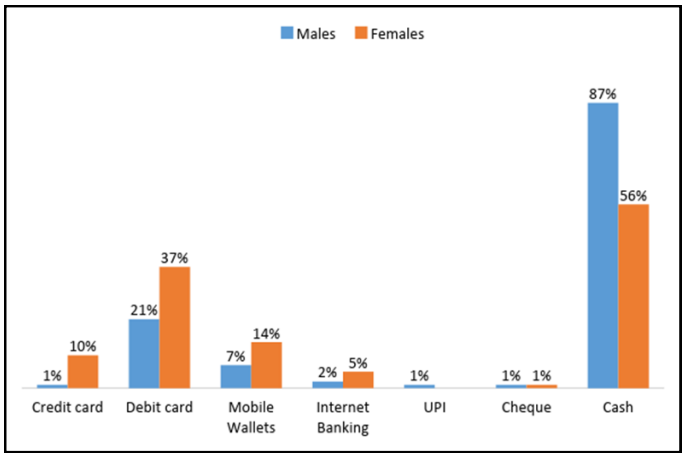


Source : Author's calculations based on survey data

4.2.2. AGE

If we are to compare young and middle aged respondents, we can expect that young people are more aware about how technology works as compared to middle aged. A digital divide exists here as well which results in the tendency that middle aged or older people are less likely to use internet than younger adults.[9] Aged people lack the confidence because of fear of losing money unknowingly. Young people, on the other hand, are aware of solutions like following up with banks, customer services etc., and are therefore more confident. The sample showed a similar pattern. With increase in age, cash usage rises significantly from 68% to 92%. Similarly, debit card usage decreased from 32% to 16%. A slight difference is also observed for credit cards, mobile wallets and internet banking.

Figure 4. *Digital payment usage pattern-AGE.*



Source : Author's calculations based on survey data

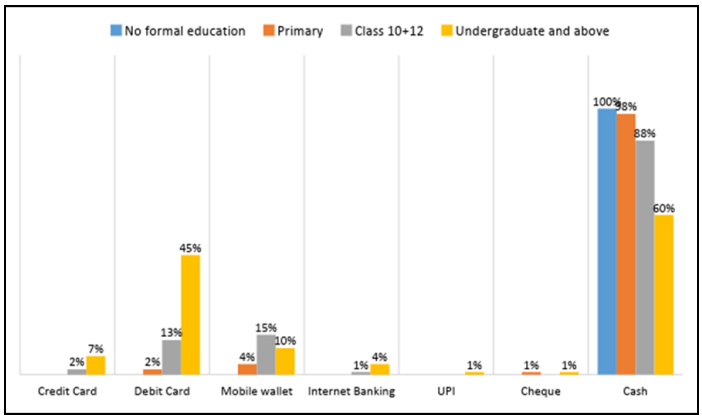
4.3. EDUCATION

The problem of complexity and low confidence level attached to digital payments can be resolved through education. Educated respondents had a higher level of self-efficacy and were ready to try instruments commonly perceived as complicated. Education could be measured by looking at the level of schooling which is a direct indicator and digital literacy which is an indirect indicator.

As a person's education level increases, his digital payment usage also increases as observed in figure 6. For people with no education and primary level of education, usage pattern is similar across all instruments. People belonging to class 10+12 education level (secondary and higher secondary) still used digital payments for transactions as mobile wallet and debit card usage is 15% and 13% respectively. Undergraduates and above had the highest debit card usage and lowest cash usage among all other levels.

For someone with no education, it would be difficult to go through the complicated process of issuing cards as it involves filling of several forms. Moreover, low education level influences confidence level and most of the respondents perceived themselves to be ineligible to use other methods as they lacked the knowledge. Problem is further highlighted when there are hardly any centers to reach out to these people to increase their involvement unlike the educated people who are more aware about the benefits of digital payments.

Figure 5. *Digital payment usage pattern-EDUCATION.*



Source : Author's calculations based on survey data

A person is considered to be digitally literate when he/she is able to operate basic features of at least one electronic device. We see that digital literacy strongly affects the lev-

[9] *Carol C McDonough. 2016. The Effect of Ageism on the Digital Divide Among Older Adults. HSOA Journal of Gerontology & Geriatric Medicine.*

-el of digital payments because none of the digitally illiterate people used any digital modes of payment. They used cash for all expenditures. There was no pattern for other payment instruments. This is mainly due to the reason that they do not have the ability to use technology which is highly intrinsic to digital payments.

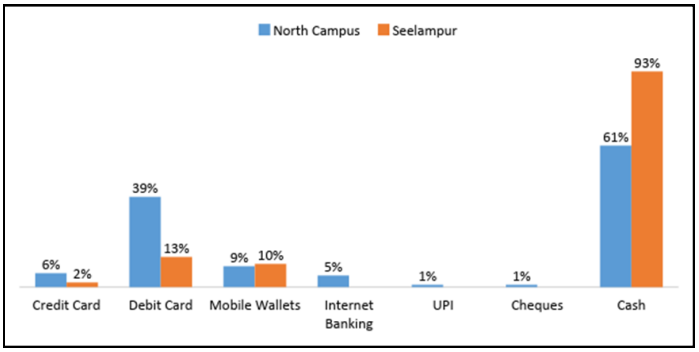
4.4. SOCIO- ECONOMIC CLASS

To check influence of class, we compared respondents from North Campus and Seelampur, where, Seelampur respondents belonged to low socio-economic class as compared to North Campus. Seelampur is considered an urban slum, comprising people with low income level. On the other hand, North Campus comprises students and residents with a middle class income. To compare the two, one would say that more cash usage in Seelampur is expected.

Cash usage is more in Seelampur than North campus, being 93% and 61% respectively. Debit card, the most common digital payment method so far, is used more in North campus for 39% transactions as compared to 13% in Seelampur.

For the pattern in mobile wallets and debit cards, we know that most of the shops in Seelampur accepted PayTm but did not have PoS terminals for cards, hence debit card usage is more in North Campus. Also, mobile wallet use requirement is related to one's ability to use a smartphone whereas, cards require bank accounts and a minimum balance in those accounts. Other methods saw low usage in both North Campus and Seelampur.

Figure 6. *Digital Payment usage pattern- DIGITAL LITERACY.*



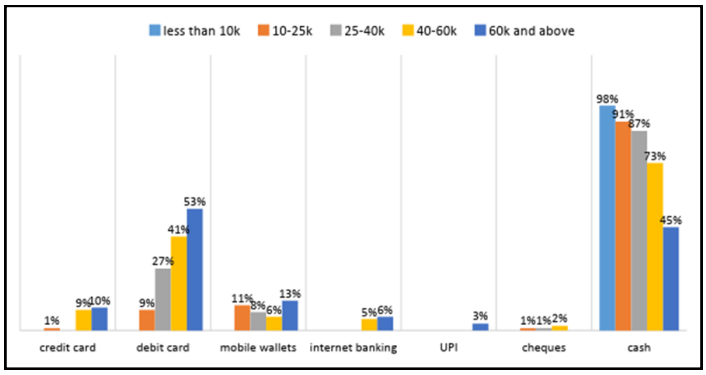
Source : Author's calculations based on survey data

4.5. INCOME LEVEL

Income was divided into 5 subcategories to observe that there is a significant increase in the debit card usage and a sharp fall in cash usage as income increases with no major changes in the internet banking, cheque and the UPI usage patterns.

People with less income led a "hand to mouth" lifestyle wherein they spent whatever they earned on essential expenditures like food and clothes and hence used only cash. Low income results in low savings and therefore, fewer amounts could be deposited in bank accounts for digital payments to function. Therefore, they highly depend on cash. Higher income groups showed less cash usage. Their nature of expenditure comprised online shopping, internet bills, purchase of electronic goods among others. For this, digital payments are used more and that is why there is a high percentage of debit card usage.

Figure 7. *Digital Payment usage pattern- INCOME LEVEL.*



Source : Author's calculations based on survey data

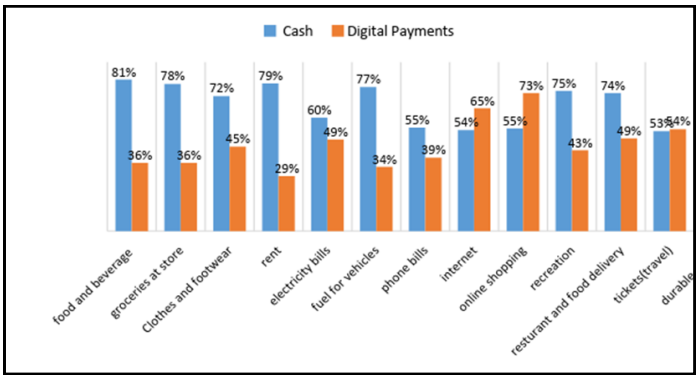
This section concludes that education, age, income and digital literacy can have an effect on a consumer's payment method. The independent impact of each category and the most important one among these will be developed later by the authors. Having looked at subcategories, patterns among different expenditure categories are analyzed next. The usage pattern previously showed 76% cash transactions. Observing expenditure separately helps us understand whether this proportion was a reflection of all kinds of payments or depended on the nature of payment.

4.6. ANALYSIS BY EXPENDITURE CATEGORY

As mentioned earlier, expenditures were divided into 13 types. To find out whether there is a different usage pattern for different types of payments, we looked at the digitally literate sections. The reason is that these people have the ability to use digital modes of payments. Hence, this part of the sample can be expected to use less cash.

For most expenditures, we saw the usual pattern of more cash usage than digital payment. The expenditures with either equal or more digital payments comprised unconventional uses such as for internet bills and travel tickets among others. The respondents, at times, used more than one method of payment and therefore these percentages do not add up to hundred.

Figure 8. *Usage of cash and digital payment across different expenditures*



Source – Author's calculation based on survey data.

The expenditures with unconventional payment pattern are discussed below:

I. **Electricity bills-** There is not much difference between cash and digital payment with the former being 60% and the latter being 48% of the transactions. This shows that digital payment is growing for electricity bill payment. Usage of Debit cards and mobile wallets is driving this behavior. As explained by the respondents, this behavior is seen as it is easier to use digital payment here because payment can be made from home and long lines can be avoided which makes it convenient.

II. **Phone bills and Internet-** For internet, digital payments are used for 65% of the transactions and cash is used for 54%. Similarly, for phone bills both payment methods are close to each other with digital payments are used 39% of the times as compared to cash which is done 55% of the times. The reason for this lies in the convenience of the mobile wallets and other payment apps. They notify the consumers timely and keep a record of bills. Moreover, network providers have their own apps nowadays like Airtel money et cetera which are used for these payments.

III. **Online shopping-** This is the only expenditure where we see that cash is less used than digital payments. Of the total transactions for online shopping, 55% were made through cash and 73% of them were made through digital means. The probable reason for this is that cash on delivery options for online shopping usually have extra shipping charges which is why people prefer debit cards over cash. Moreover, there is cashback for using cards on almost all websites.

IV. **Travel-** Cash and digital payments are almost similar for this expenditure with the former being 53% of transactions and digital being 54%. Main reason behind this is convenience. This is because railway stations have long queues and 'tatkal' tickets can be done on the IRCTC website faster.

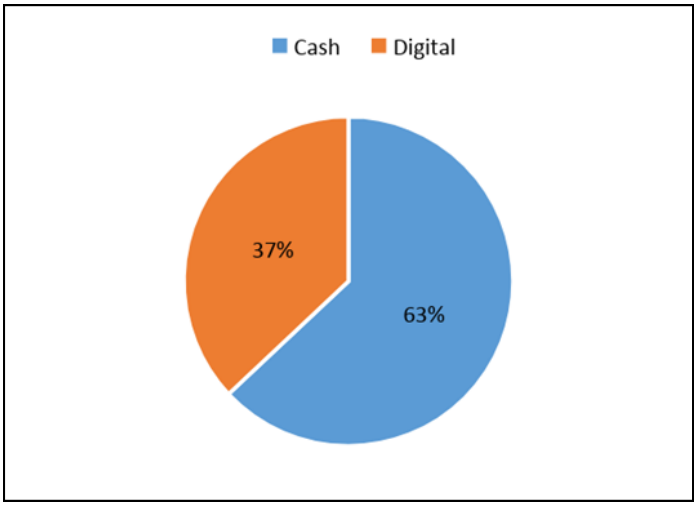
This subsection helped us identify that the general results for mode of payment of transactions are not similar for all types of expenditures. Unusual pattern was seen for payments like phone bills, internet bills, online shopping et cetera mainly due to the convenience attached to it.
In this section we first compared the ownership of instruments. Debit card was owned the most followed by cheques, mobile wallets and others. The probable reasons for this were also discussed. Even though ownership existed, it was important to know how it was reflected in actual usage. Our observation proved that actual usage was more in cash as compared to digital payments. Therefore, even if people owned digital methods, not all of them were using it. Cash usage was also explored for sub categories which proved to have an impact on digital payments. These categories included gender, age, education, socio-economic level and income. However, the impact on payment method was not same for all kinds of expenditures which was further studied. Some expenditure showed more or almost equal cash and digital payment usage. Hence, we can say that the nature of payment also influenced payment method.

The next section explores the preference pattern of consumers. It studies whether preferences could drive one away or towards digital methods. Looking at preferences of consumers would help us understand the attitude of the consumers. This preference can be compared to actual usage to see if the ones preferring a method of payment are actually carrying it out or not.

4.7. PREFERENCES

When asked about the preferences about one method over the other, we got the following results-

Figure 9. *Preferences*



Source : Author's calculations based on survey data

We observe that the preference for digital payments is similar to the usage patterns. After asking them their reasons for cash, we got the reasons, in order of importance, as-

I. **Easily acceptable-** Cash is accepted everywhere, while on the other hand, many shops (especially in Seelampur) still don't accept cards or PayTm. Day to day payments for buying fruits and vegetables from vendors are done in cash because other methods are usually not accepted. Moreover, at times when the servers are down, cash can come in handy.

II. **Convenient-** It is considered convenient because one would not have to deal with the hassle of going to banks to apply for cards and internet banking. Completing KYC requirement and linking Aadhar number to account are seen as troublesome processes by many.

III. **Time saving-** It is faster as the respondents mentioned that by keeping cash ready, they could finish payments faster instead of waiting for the internet to connect (in case of payment phone apps). They obviously ignored the time they could save by escaping lines for paying bills and booking tickets but the major concern lied around owning the means of digital payments. For those having cash at home, it was time consuming to go and deposit it in banks.

IV. **Earnings in cash-** Few people, belonging to low income groups, preferred cash because whatever little they earned, they earned in cash. Their income was exhausted and fewer savings were done to be kept in the banks for card payments to function. Moreover, people earning high amount in cash feel that they can avoid accountability by keeping large amounts of cash at home and therefore, use that cash for expenditure.

V. **No experience /knowledge of digital means-** Most people still hold on to cash because this is the only mode of payment they are familiar with. Their lack of experience serves as a fear that they might lose money by clicking on unknown links.

Reasons for not using digital means are as follows-

I. **Complicated-** As mentioned above, this did turn out to be one of the most important reasons why people still do not go for digital payments. The process could be complicated from the beginning. Debit cards, although popular, are difficult to use at PoS terminals as well as ATMs. People feel that it is only the educated class that can deal with the process of issuing credit cards and don't find themselves having enough income to payback. In case of mobile wallets and other phone applications, the process is made more complicated by the usage of a smartphone. Results show that 15% of the respondents could not use a smartphone at all. Out of those who do, a considerable number is not fully comfortable. KYC and linking Aadhar also served as a hurdle for some. Apart from these, people lacked the confidence to use unconventional ways because of money being involved. Language also affected choice of payment as some mobile applications are not available in all regional languages.

II. **Less secure-** Respondents felt that there is a threat of fraud in electronic payments. With cases of bank account hacking, they feel insecure using cards. Many of them were convinced that it would lead to loss of money for them at some point. This kind of feeling is widespread due to the fraud cases they hear or read about in the news.

III. **No knowledge-** Majority respondents who preferred cash payments said that they did not have enough knowledge about other methods. This reason was common in all digitally illiterate people. They complained that they lacked experience to carry out digital payments on their own at home or at stores and restaurants. Step by step explanation and help in first few payments is something they needed.

IV. **Less acceptable-** Not all places accept cards. So, even if one wants to pay with other methods, he cannot. This was observed especially in Seelampur. Even the market area hardly had any shops with PoS terminals installed. Few shops still accepted PayTm payments but card acceptance was low. Moreover, for consumers, the nature of payment influenced usage of digital methods. For instance, people whose expenditure mostly comprised buying day to day items like food and dairy used cash as vendors accepted only cash. Therefore, acceptability varied across expenditures.

V. **No need-** Many said that they did not feel the need to make payments digitally as they were more comfortable and habitual of using cash. It was difficult for them to get out of their comfort zone unless it was absolutely necessary. Even if it was necessary, they would find other ways like asking someone else to make digital payments on their behalf and paying them in cash.

This section shows that the actual usage of digital payment methods is similar to its preference. It proves that it is the preference of a person which drives his/her payment pattern. For increasing digital payments, preferences have to change. Even if barriers are removed in terms of

infrastructure and incentives, it will still be a gradual shift to a less cash economy because behavior of the consumer has to be taken into account. Policy and initiatives should work towards tackling problems at the basic levels through engagement with consumers. This section also looked at the reasons why these kind of preferences exist. These reasons should be taken into account to change the perception of the consumers gradually.

CONCLUSION

By looking at the above discussion, we can conclude that cash is still used in every arena be it for different expenditures or by different kinds of people. For respondents belonging to groups like females, digitally literate, education, young and upper class, we see that some kind of digital payment method is being used. Although cash still exists alongside. No matter how convenient cashless payments can be, there are a significant number of people dependant on cash just because they are used to it. They find digital payments too complicated to make an effort in that direction. Digital payments were affected by education level, digital literacy, age group, socio-economic class and income as expected.

Digital methods of payment also depend on the kind of payments consumers make because for buying food from local markets, high amount of cash is used but for online shopping, more debit cards are used in transactions. This is because of the nature of expenditure and the acceptability of digital methods. For instance, consumers are more likely to pay vegetable vendors in cash but make online shopping payments through card. Although financial inclusion and ownership of instruments is significant, usage is still low due to traditional approach of consumers.

To add to this, awareness about initiatives, which would have helped boost electronic payments, is still low. Training sessions are required as most of the people restrict themselves as they lack experience. In conclusion, we can say that India is still not a less cash economy and digital methods are still not welcome.

ACKNOWLEDGEMENT

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LOOKING AT INEQUALITY THROUGH KUZNETS RATIO

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Abstract

In this paper, we review major literature of the past with respect to global income inequality trends and relationship of income inequality with other variables of an economy. Then, we study income disproportionality by looking at the cross-section of 24 countries for the time period of 2001 to 2014, with the help of the Kuznets Ratio. We seek to find a relationship between income inequality and income (not necessarily a direct causation). Next, we observe the trend of income distribution for our selected time period. Our conclusion reveals a weak association between income disparity and growth of per capita GDP. Lastly, we find that the share of total income of the top 10% rich individuals in the world has fallen, hinting at a fall in income inequality.

1. INTRODUCTION

A substantial number of papers have studied income inequality in the past. These studies have come in various forms. Some examine inter-country and intra-country income disparity trends and some study the linkage of this disparity with variables like growth, development, 'happiness'[1] and even on inequality itself. There are numerous reasons to study income disparity. One reason is that we may be interested in it intrinsically, since large magnitudes of such a disparity may be viewed as unfair. Second, we may look at it as a forecasted outcome of a theory such as the convergence or divergence theory. Based on empirical evidence, it might help us in judging accuracy of certain theories. Third, it could be used to explain a phenomenon of interest. For example, high inequality may be used to explain high inequality of opportunities available to individuals in an economy or as a key factor affecting crime and political instability.

The interesting observation from the existing literature is that there are contrasting arguments for the trend of income distribution and there is no consensus for any statistically significant association between such inequality and any of the above-mentioned variables. Since high-income growth is one of the most crucial aims of every economy in the world, in this paper, we try to look for a correlation between global income disproportionality and income growth rather than a causal relationship. In particular, this paper asks whether there is any particular relationship between level of income and inequality when we look at the time period of 2001-2014. Moreover, we move one step further to check the possibility of a relationship between the growth in inequality and the growth in income. We also touch upon the global income distribution and comment regarding the changes taken place therein. We have considered income inequality as a type of inequality for this paper. Hence, the reader should note that whenever the word 'inequality' is mentioned in the paper from section 3 onwards, it stands for income inequality.

Section 2 contains literature review followed by research objectives in section 3, data, methodology and findings in section 4, conclusion in section 5, limitations in section 6 and scope for further research in section 7.

2. LITERATURE REVIEW

Contrasting conclusions for the direction of income disparity lead to difficulty in further analyzing what effect it has on other variables. Based on the data from Zanden

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[1] *See Oishi, Shigehiro, Selin Kesebir, and Ed Diener "Income Inequality and Happiness." Psychological Science 22, no. 9 (2011): 1095-100.*

(2014), majority of the world lived in absolute poverty in 1800 as of today's standards. 175 years later, in 1975, a rapid increase in inequality was seen. The world was divided into 2 parts; a destitute, developing part and a developed part which was more than tenfold richer. As of 2015, inequality had declined to a large extent, and majority of the population was above the international poverty line. Roser (2018) states that from a period of 1988 to 2011, global inequality had increased in the first 2 terciles and has been decreased since then. Hellebrandt and Mauro (2015) endorse that global income disparity has declined, from a Gini coefficient of 68.7 in 2003 to 64.9 in 2013.

Cornia (2003) examines that global income inequality increased in the early 1980s and 1990s. Milanovic (2009) on the other hand, calculates Gini indices over time from 1820 to 2002, and observes a consistent increase in it, with a large increase 1980 onwards. UNICEF Social and Economic Policy Working Paper (2011) shows some reversal of this trend, although it suggests that the inequality situation could have been worsening while the study was conducted due to the then ongoing global economic crisis of that time. The World Inequality Report (2018) asserts that since 1980, income inequality has increased in nearly all countries in recent decades. It has increased enormously in Asia and North America, has amplified to a relatively lesser degree in Europe and has stabilized at exceptionally high levels in the Middle East, Brazil and sub-Saharan Africa. Oxfam (2018) – annual report on global inequality finds that 82% of the wealth that was generated in 2017 went to the richest 1% population of the world. The report points out that in many countries wage disparity has risen and the share of labour compensation in the GDP has fallen because profits have grown more quickly than wages.

Thomas Piketty's collection of research in his magnum opus "Capital in the Twenty-First Century", (2013) provided a major breakthrough in the field of research on inequality and spurred a global debate on inequality. His carefully maintained dataset led him to establish that the simple reason for rising inequality in the past is due the fact that return on capital has always remained greater than the growth rate of the economy. His findings regarding the effects of taxes on income distribution reflected that inequality is not just the result of economic forces, but also the result of policies and politics.

Yitzhaki (1997) argued that different methods of calculating income and income variation would lead to different results and perhaps this might be the factor that leads to compelling yet contrasting conclusions.

Research papers of the past have especially tried to find a direct relationship between income growth and income inequality, that is, whether such disparity is deleterious or beneficial for income growth and if growth has any impact on income distribution. Although it turns out that there is no consensus in literature for any statistically significant association among these two variables, many papers make some strong related observations. Kaldor (1957) argued that a high profit to wage ratio, implying greater income disparity, would lead to greater growth. Earliest measure of income inequality in growth regressions, in 1990s, found a significant negative coefficient, implying negative effects of income inequality on growth outweigh positive effects. The issue is these papers relied on ordinary least squares or instrumental variables regression. Later studies found that omitted variables in these papers may have biased the OLS coefficients.

The literature in and after this time was mainly divided into two models. First model stated the effects of income disparity and imperfect capital markets on investment activities. There is a positive wealth threshold, below which individuals choose not to invest in human capital. A higher number of people below the threshold leads to lower aggregate wealth in equilibrium and lower growth. Poor people have a low opportunity cost of having children (low wage rate) and therefore have greater number of children. Credit market restraints do not allow them to have 'high quality' children, increasing the supply of unskilled workers, reducing their wage rate and further increasing inequality. This may suggest that poverty may itself lead to increased poverty and decreased growth. The second model talked about the political economy, where inequality leads to taxation and spending decisions that may not match with the socially optimal decisions. Barro (2000) considered the possibility that the effect of inequality on growth might differ between rich and poor countries. While no significant relationship is found for the whole sample, he reports a significantly negative relationship for the poorer countries and a positive relationship among richer countries when the sample is split. The paper also states that the 'inverted U hypothesis', as proposed by Simon Kuznets, seems to be an empirical regularity for nations.

Benabou (2000) asserted that since greater voting power is exercised by wealthier people, inequality might lead to lesser rather than higher taxation. Milanovic (2005) finds that at low average income levels, the income share of the poor is smaller in economies that are more open to trade. Ravallion (2012) claims that a higher level of poverty rather than inequality is strongly associated with lower economic growth.

3. RESEARCH OBJECTIVES

Given this literature backdrop, we try to answer three particular questions in this paper. First, we seek to understand the dynamics between inequality and income by looking at the cross-section of 24 countries for the time period 2001-2014. In particular, we try to answer whether there is any particular relationship between inequality and income. After looking at the issue of inequality and income, we move forward and see if the rate of change in inequality depends upon the changes in the rate of growth of per capita GDP. Lastly, we touch upon the global income distribution and see the changes that took place in the shares of income at every decile of the distribution in the given time period.

This paper reviews the income inequality trend and growth & inequality relationship for the recent time period of 2001-2014 through the Kuznets ratio, which provides a newer and alternative outlook on income disparity and its association with income growth. Not necessarily attempting to establish a causal relationship, our analysis becomes free of a lot of restrictions (eg. methodology selection errors, omission of variables) as found in existing literature. Our third objective, which particularly looks at only the trend of income inequality and questions the existence of the 'Elephant Curve' in this relatively current time period, becomes crucial in carefully interpreting the recent debates in the popular press regarding global inequality.

4. DATA, METHODOLOGY & FINDINGS

The entire data for the current analysis has been extracted from the World Inequality Database which is maintained by Thomas Piketty, Lucas Chancel, Gabriel Zucman and their colleagues.

To answer the first two questions, we use Kuznets Ratios as a measure of inequality. As mentioned in the literature review, Kuznets Ratio looks at inequality through the ratio of share of income of top x% rich and bottom y% poor. For this paper, we have defined Kuznets ratio as the ratio of share of income of top 10% rich and bottom 50% poor. An increase in Kuznets ratio means increase in income inequality, while decrease in Kuznets ratio means decrease in income inequality.

Before moving forward, it is important to understand why this definition of Kuznets ratio is used and why the stated number of countries and the respective time period is selected. Throughout the process of preparing this paper, our emphasis has been to keep our data as much comparable across countries as possible. Therefore, during the process of cleaning up the dataset, we rejected the countries whose data was not directly comparable to the most available data of countries.

The issue that arises is that the World Inequality Database contains different types of income variables like national income, gross domestic product, net domestic product and fiscal income and not all income variables are available for all the countries. For some countries, it provides the data for national income, while for the others, it provides data for net domestic product. The problem becomes more complicated when the database uses different criteria of calculation of income variables for different countries. To be precise, it uses three different population age group and 3 different population category group to derive a value of a particular income. The three population age groups are adults-including elderly (20+), adults-excluding elderly (20-65) and all ages. The remaining 3 population categories are individuals, tax units and equal-split adults (income or wealth divided equally among spouses).

Each income variable has to belong to a particular age group and a particular category group. Hence, a total of nine different variants are available for one income variable, and again, not every variant is available for every country. At most two or three variants for share of national income were available. Hence, among all the different permutations of income variable, their population ages and categories; we made sure that we take maximum number of countries with maximum time period of data of common income variable with same population age and same category. Doing so, we arrived at a panel data of 24 countries spanning from 2001 to 2014 with income share data of top 10% rich and bottom 50% poor[2]. The income variable selected is the share of pre-tax national income (of top 10% and bottom 50%) of age group adults-including elderly (20+) and category equal-split adults.

Moving forward, we try to analyze the first question. We use scatterplot and correlation coefficient as our tool. Our hypothesis is that if there exists a definite relationship between inequality and income in our panel of selected countries, then that relationship will be reflected in the scatterplot with values of Kuznets Ratio and log of per capita GDP on each of its respective axes. Moreover, if the relationship turns out to be linear, it will also be reflected in the values of correlation coefficient, whose value will be close to -1 or 1. Even if there exists some non-linear relationship, scatterplot is a useful tool to capture

[2] *See the list of countries in the Appendix.*

that. Table 1, shows the correlation coefficient of Kuznets Ratio and per capita GDP for the cross-section of our sample from 2001 to 2014:

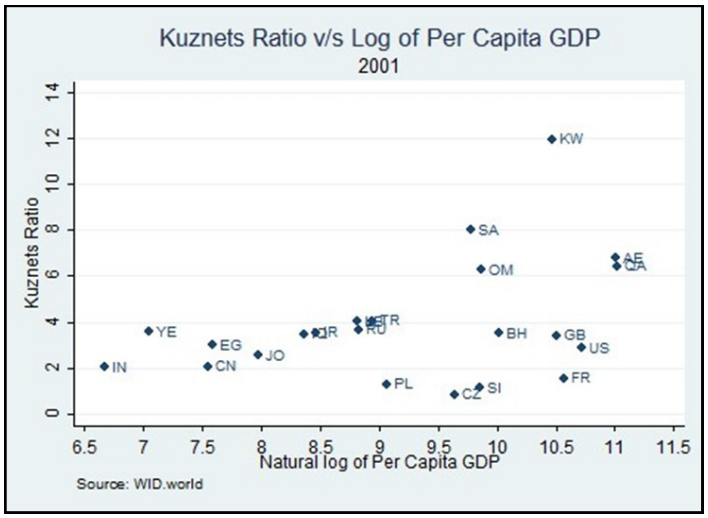
Year	Correlation Coefficient
2001	0.41
2002	0.37
2003	0.4
2004	0.43
2005	0.47
2006	0.51
2007	0.5
2008	0.49
2009	0.43
2010	0.31
2011	0.31
2012	0.34
2013	0.36
2014	0.35

***Table 1**: Correlation coefficient between Kuznets Ratio and GDP per capita from 2001 to 2014.*

As the table depicts, we don't find the correlation coefficient to be significantly strong for any year within the considered time period. Usually, the correlation coefficient of greater than or equal to 0.75, or less than or equal to -0.75 is considered to be a strong correlation between two variables. One can notice from the table that most values of correlation coefficient are closer to zero, with the value of just 2006 barely crossing the 0.5 mark. Moreover, it is intriguing to note that the value of correlation coefficient is positive for all the years. This leads us to conclude that income and inequality usually move in the same direction, but the relationship of this movement seems to be weak. Also, the chances for the relationship to be linear gets rejected due to the lower values of correlation coefficient.

Further, the possibility of presence of any non-linear relationship is checked by preparing the scatter plots for the cross-section of all 24 countries for 2001-2014. Mentioned below is the scatterplot for the year 2001. We notice some movements in the data points of the plot during each respective year, however, the shape of the scatter mostly remains the same throughout our time period. Hence, looking at the scatter plot for 2001 can give a good idea regarding the shape of the scatter throughout the time period.

***Figure 1**: Scatter plot of Kuznets Ratio and log of per capita GDP*



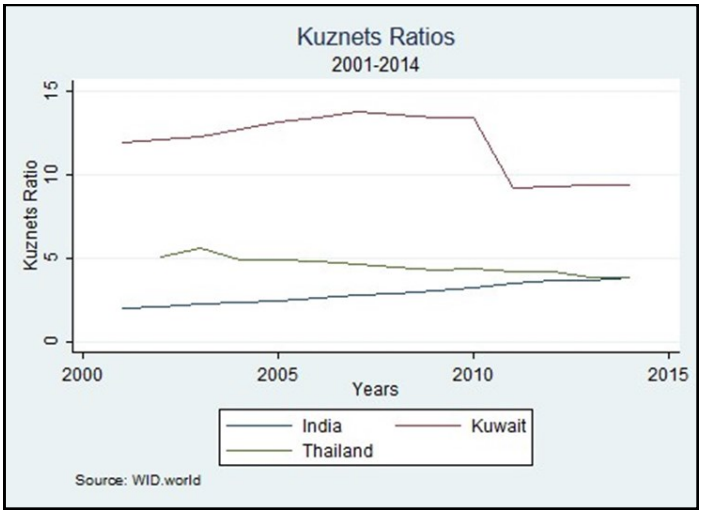
Source: WID.world

The first impression of Figure 1 allows us to comment that the possibility of noticing an 'inverted U' is completely rejected for our sample of countries since countries like Kuwait (KW), Saudi Arabia (SA), Oman (OM), Qatar (QA) and United Arab Emirates (AE) show higher values of Kuznets Ratio even at higher levels of per capita GDP. Moreover, if there are chances of existence of a non-linear relationship between income and Kuznets Ratio, the direction of that relationship seems positive with the increase in income and not the other way around.

Allowing us to digress a little, when we track the movement of countries in the scatter plots year after year, we notice that not all countries move in the same direction. For example, India is one of the very few countries among our sample whose values of Kuznets ratio rose every year. While on the other hand, country like Thailand registered a continuous fall in its Kuznets ratio from 2004 onwards. Moreover, the movement of the Kuznets Ratio also seems to be affected by the political situations within a country. Kuwait registered a steep fall in its Kuznets Ratio during the 2011 due to its political crisis[3]. This decline, however, was a result of the decrease in wealth of its top 10% rich population and not due to the increase in the share of bottom 50%. The Figure 2 shows the Kuznets Ratio of the mentioned countries over the time period.

[3] *See https://www.bbc.com/news/world-middle-east-20026581*

***Figure 2**: Kuznets Ratio of India, Kuwait and Taiwan for 2001-2014*

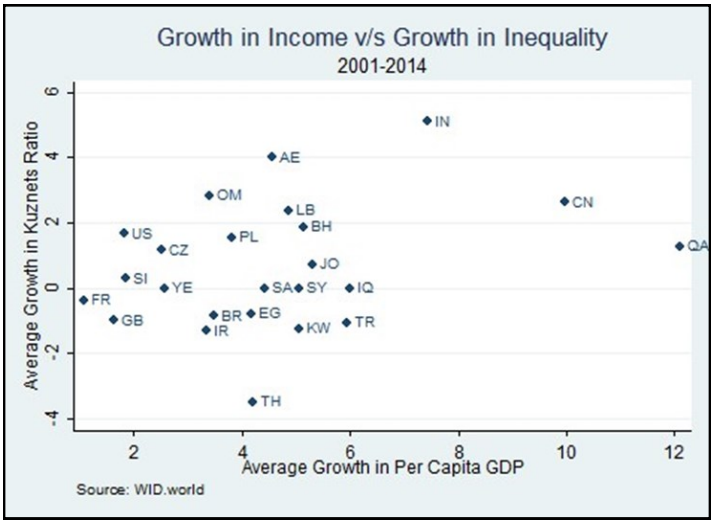


Source: WID.world

Moving on to the second question, we try to find out whether any trade-off exists between growth and inequality. It is important to note the distinction between this question and the earlier one. Earlier, we asked whether there exists a relationship between inequality and level of income. Here, we ask whether high growth of income comes at the cost of higher inequality. To be precise, we examine the relationship between growth of per capita GDP and growth of Kuznets Ratio now.

To test this relationship, we plot average growth of Kuznets Ratio of countries over the years against the average growth of per capita GDP. The reason behind taking average growth of both the variables is that inequality may respond slowly to the changes in level of per capita GDP. Therefore, to ensure that the lag response is captured, we take average growth rate so that all the observations of the dataset are utilized while preparing the scatter plot.

***Figure 3**: Scatter plot of average growth of Kuznets Ratio against average growth of income for 2001-2014*



Source: WID.world

Figure 3, hints us about the existence of the inverted-U relationship over here. However, this presence of inverted -U relationship is again a weak relationship since there are only three countries growing above the rate of 7% in our sample and they happen to lie on a downward slope. If we remove these three countries from the graph, then the remaining part of the scatter doesn't provide us with any indication of the presence of a definite relationship.

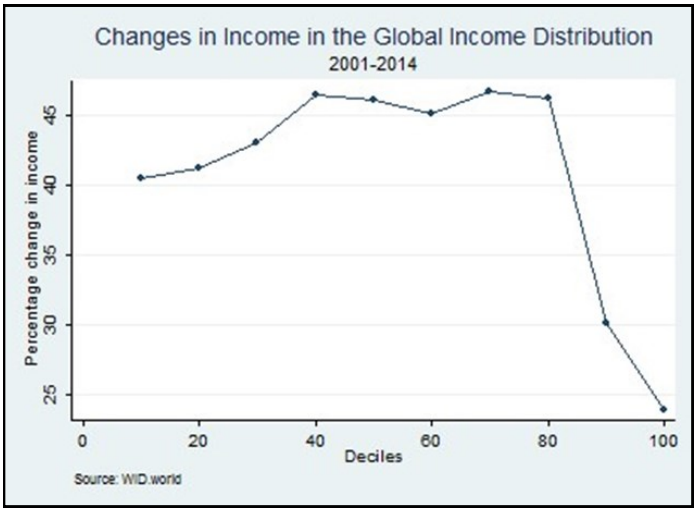
If there actually is an inverted-U relationship present for all countries, then its interpretation would be that initially, growth can be brought by triggering increase in the incomes of the top deciles of the population, but further increase in growth rate requires a country to trigger increase in income across all the deciles of population. It might be possible to comment that growing at higher rate can only occur if that growth is inclusive in nature. Thinking regarding the tradeoff between high growth and inequality, the scatter plot does not provide us with a definite answer, but just hints towards a weak inverted U relationship.

Lastly, moving to the question of global inequality, we deal with the findings of "Elephant Curve" which was first noted by Branko Milanovic and then, subsequently constructed by various authors in the World Inequality Report. The Elephant Curve of World Inequality Report 2018 showed that much of the total increase in income during 1980-2016 period was captured by the top 1% rich population of the global income distribution. While the population from 20th percentile to 70th percentile did notice some increase in their real incomes, it was the population from 70th to 90th percentile which noticed by very little increase in their real incomes.

If one visualizes the shape of the curve which shows the increase in real income at each percentile, then that shape resembles to that of the trunk of an elephant and hence, called the "Elephant Curve". Milanovic used this curve to show the winners and losers of globalization, while the World Inequality Report uses it to show the dynamics of global inequality. The time period used by his study was 1988-2008. Over here, we show that when we choose the time-period of 2001-2014, the one which we used for the earlier analysis, we don't find the existence of the elephant curve. Figure 4, charts the percentage change in average income across every decile of the global income distribution.

Instead of noticing the sharp increase in income at the top decile, we find that the increase in income is, in fact, the lowest in the top 10% across the global income distribution. This lowest increase also brings down the share of top 10% in the income distribution and thereby, increasing the share at the lower deciles, as shown in Figure 5.

***Figure 4**: Changes in income at every decile of global income distribution for 2001-2014*

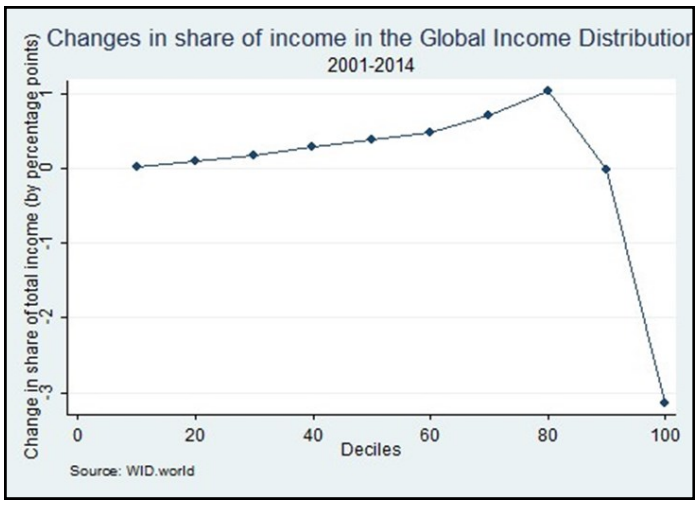


Source: WID.world

This decrease in share at higher levels of income distribution and increase at lower levels can be seen as a progressive transfer. The famous Dalton principle in the field of inequality measurement states that inequality in a given distribution should decrease in presence of a progressive transfer[4].

Such decrease in global inequality is evident from the Kuznets Ratio of the global income distribution which fell from 6.33 in 2001 to 5.42 in 2014. However, it is important to note that the share of total income of the poorest 10% has hardly changed.

***Figure 5**: Changes in share of total income at every decile of global income distribution for 2001-2014*



Source: WID.world

Our analysis shows that inequality in the global context has improved for 2014 in comparison to 2001. While the "Elephant Curves" of Milanovic and World Inequality Report tells us that the picture is not so good if we look at the 1980-2016-time period. This led us to conclude that much damage to the global income distribution must have occurred during the time period 1980-2000.

5. CONCLUSION

Our analysis brings us to the following conclusions regarding the inequality and growth for the cross-section of our selected sample of countries for 2001-2014:

I. There remains a weak positive correlation between inequality and levels of per capita GDP for all the years.
II. Despite the correlation, no definite relationship between inequality and income is noticed. Hence, Kuznet's, 'Inverted-U' hypothesis is not seen as an empirical regularity.
III. The 'Inverted-U' relationship between growth of inequality and growth of per capita GDP also appears to be weak.
IV. No shape resembling to 'Elephant curve' is noted when the changes in income across deciles of global income distribution is plotted for the time period 2001-2014. Since the 'Elephant curve' is mostly observed from the time period of 1980 to 2016, we are convinced to argue that much damage (in terms of inequality) to the global income distribution took place during the time period around 1980-2000. While the condition of global inequality seems to have improved from 2001 to 2014 as noticed by the decline in the Kuznets Ratio of the global income distribution.
V. The share of total income of the top 10% rich people in the global income distribution has declined from 2001 to 2014.

6. LIMITATIONS

One possible limitation of our analysis is that the sample of selected countries may not properly represent all the countries of the world. As shown by the tables below, almost half the size of our sample is occupied by West Asian countries like Saudi Arabia, UAE and others. Moreover, as per income group classification provided by the World Bank, much part of our sample is occupied by high income and upper middle-income countries.

[4] *A progressive transfer, as originally formulated by Dalton (1920), is a transfer of income from a richer individual to a poorer individual. In our case, we relate it to the fact that the income share of the richer individuals has decreased and the share of poorer individuals has risen.*

***Table 2**: Frequency distribution of countries as per region*

Region	Frequency
Central Europe	3
East Asia	2
Eurasia	1
North Africa	1
North America	1
South America	1
South Asia	2
Western Asia	11
Western Europe	2
Total	**24**

Source: worldbank.org

***Table 3**: Frequency distribution of countries as per income group*

Income Group	Frequency
High Income	12
Low Income	1
Lower Middle Income	2
Upper Middle Income	9
Total	**24**

Source: worldbank.org

It is important to note that these limitations are noted with respect to the findings of question one and two of the analysis and does not apply to the findings about the global income distribution, since that data is separately provided in the World Inequality Database. Moreover, our opinion is that these limitations do not invalidate our findings about the cross-country comparisons completely. If we treat the sample as representative of upper middle income and high-income countries, then as per the postulated 'Inverted-U' hypothesis by Kuznets, we should have noticed downward trend in inequality with increase income, which was not noticed. Hence, based on this line of reasoning, the possibility of Kuznets hypothesis still gets rejected.

It is important to note that our choice of the sample arrives from the fact that we laid utmost importance to use data which can be readily comparable across countries. Hence, there is no unclarity regarding our findings when it comes to the comparability of countries within the dataset, since all the observation arrive from the same income variable.

7. SCOPE FOR FURTHER RESEARCH

The findings of our research could be further refined by using econometric techniques like running a panel regression across dataset. Moreover, the size of the data set could be increased by using regression to estimate the values of income shares at various deciles for the countries whose income variables are different from the one considered in this paper.

ACKNOWLEDGEMENT

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APPENDIX

List of countries :

Kuwait	Bahrain	USA
Lebanon	Brazil	United Arab Emirates
Oman	China	United Kingdom
Poland	Czech Republic	Yemen
Qatar	Egypt	
Russian Federation	France	
Saudi Arabia	India	
Slovenia	Iran	
Thailand	Iraq	
Turkey	Jordan	

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A STUDY INTO THE ROLE OF MOHALLA CLINICS IN REVOLUTIONIZING PRIMARY HEALTHCARE IN DELHI

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Abstract

This paper analyses the role of Aam Aadmi Mohalla Clinics in improving primary healthcare in Delhi and how they cater to the demand of the patients. These clinics provide basic services in underserved areas in a receptive manner and free of cost. This scheme has garnered much recognition worldwide and also by other Indian states that they plan to adopt a similar healthcare structure to improve the health status. Our paper covers the gender disparity prevalent in patients at these clinics and the factors that influence the satisfaction of patients. The paper establishes how these clinics have made primary healthcare affordable by reducing the cost burden on patients. It also lists various ways of improving these clinics.

1. INTRODUCTION

"Healthy citizens are the greatest asset any country can have."
- Winston Churchill

Health is an important factor contributing to the economic progress of any nation. A healthy population lives longer, is more productive and acts as a catalyst in the economic growth. It is also central to the well being and happiness of people and society. Mohalla Clinics is a new concept in primary healthcare system undertaken by the Aam Aadmi Party in Delhi. They provide an assured package of services with the aim of making basic healthcare more accessible. The services provided are free of cost and they make it all affordable by reducing indirect costs like travel since the clinics are set up in residential areas. Over the years, this system has received global recognition. Kofi Annan, former secretary general of UN expressed that the project could be a model for all Indian states "embarking on the universal healthcare journey."

The lack of primary health-care units had led to overcrowding in government hospitals which in turn led to delay in treatment of patients. Mohalla clinics cater to these problems hence ensuring quicker and cost effective treatment. There are currently 158 such clinics in rented premises and porta-cabins that are operational Monday to Friday from 8 am to 2pm. Each clinic has four employees - a doctor, a nurse, a pharmacist and a technician. According to the Aam Aadmi Party website, they provide 109 types of essential medicines, and are equipped to conduct over 200 tests and initial diagnosis. Apart from providing treatment for common illnesses like fever, diarrhoea etc., first aid for injuries and burns, antenatal and postnatal care for pregnant women, are also provided. They also aim to spread preventive education and awareness among the people.

2. BACKGROUND

The healthcare system prior to the introduction of Mohalla Clinics, included primary urban health centres (PUHCs) and dispensaries run by the central and state government. These centers were equipped with basic laboratory services and provided services like immunization, reproductive healthcare, general OPDs and referrals. They also carried out outreach programmes in underserved localities in association with other healthcare organizations, particularly concerned with maternal and child health.

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However, despite these healthcare centres, there was a lack of availability of primary healthcare since these centres were not uniformly spread across all areas /localities and faced the problem of severe overcrowding as they were significantly understaffed. There was a pressing need to improve the healthcare system and strengthen the primary healthcare as it is one of the basic human needs.

The Government of Delhi in 2015 started the Aam Aadmi Mohalla Clinics (AAMC) with the aim of tackling this problem of overcrowding and understaffing. They reorganised the healthcare system and divided it into four levels which are as follows:

I. Aam Aadmi Mohalla Clinic for primary health care.
II. Multi Speciality Poly Clinic for secondary health care in the form of OPD consultation by specialist doctors including diagnostics. (Conversion of dispensaries into polyclinics)
III. Multi-Speciality Hospital for IPD care (earlier called Secondary Level Hospital)
IV. Super-Speciality Hospital earlier called Tertiary Level Hospital.

3. LITERATURE REVIEW

The existing literature that we came across, gave Aam Aadmi Mohalla Clinics both criticism and praise. Lahariya (2017) highlighted the importance of these clinics, especially during the months of September- October 2016, when Delhi was facing the outbreak of dengue and chikungunya. As the diseases were widespread, many patients were able to get diagnostic tests at these clinics hence relieving hospitals of excess crowd and dividing the patient crowd. By the end of the year 2016, around 1.5 million patients had been examined at these clinics. However, there has been a delay in setting up of more clinics despite of the great demand by people. Different factors are responsible for this delay, majorly dependent on the administration and selection of location for these clinics and also on the insufficient advance planning of the operations of these clinics. The paper also points out the way these clinics have not been able to become a comprehensive PHC (public health centre) and has mainly focused on "clinical/curative" services. Another study conducted by the Delhi-based think tank, Centre for Civil Society, revealed that 88% of the patients treated at these clinics had an above average level of satisfaction. The empanelling of private labs to provide free tests (for which the government compensates) also helps the patients evade the otherwise high costs of diagnostic tests. Even the government need not incur procurement and maintenance cost of sophisticated equipments (CCS, 2017).

According to this paper, since the government does not have to pay doctors salaries and their wages are tied to the number of patients they meet, problems such as doctors absenting themselves from work and arriving late do not arise. But a number of problems were faced by patients in regard to these areas as doctors sorted to over invoicing of patients and reduced time per patient, to make more profit. Also, the results of the tests conducted were also questionable as some claimed them to provide wrong reports. Another article by Kuruvilla (2017), critiqued the clinics on multiple fronts starting with how the system of remuneration linked with the number of patients has lead to doctors inflating their bills. He also agreed with the problem of the clinics focussing solely on curative services and not prevention.

4. SAMPLE AND SURVEY DESIGN

4.1 Methodology

The study is based on primary research conducted in 11 Mohalla Clinics in two different districts (North and West Delhi). Primary data was collected through individual interview with the help of questionnaires. The field survey was divided into phases wherein pilot survey was followed by the main survey. The final questionnaire was prepared after conducting and evaluating the pilot survey which was carried out on a smaller sample size. The main survey was conducted from March to June 2018. Two different samples were constructed; one included the patients' visiting the clinics and the second consisted of people living nearby[1] the clinics. There were separate questionnaires for both samples. The total numbers of patients interviewed in the Mohalla Clinics was 142 and the number of nearby residents interviewed was 49.

4.1.1. The Field Areas: North-West Distinction

Our survey included 7 clinics in West Delhi in different localities (Vikas Nagar, Uttam Nagar, Nangloi, Palam, Paschim Vihar) and 4 clinics in North Delhi (Kamla Nagar, Keshavpuram and Wazirpur). We chose these two districts solely because of the density of clinics[2] in West Delhi and North Delhi. It was also more convenient to visit these areas as compared to East Delhi. Moreover, South Delhi has the lowest number of clinics relative to the other districts. The population of West Delhi is ap-

[1] *The sample of residents nearby was added so as to keep the total sample unbiased and random and to find the proportion of people aware of the clinics and not visiting and the reasons for the same.*

[2] *Source: www.delhi.gov.in (last accessed August 2018)*

proximately three times the population of North Delhi.[3] Hence, the proportion of West Delhi clinics in our sample is higher as compared to North. The concentration of clinics is also higher in West Delhi.

5. FINDINGS AND ANALYSIS

The analysis has been broken down into two parts according to the two different samples that were surveyed. The first sample comprises of people visiting the Mohalla Clinics and the second sample is of people living nearby but not visiting the clinics.

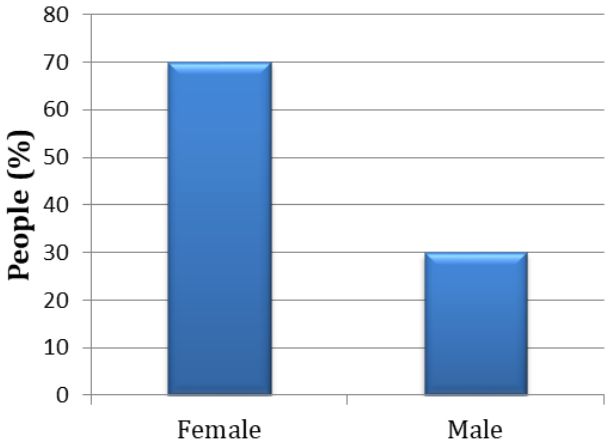
5.1 Analysis of Sample 1

5.1.1. Gender Disparity

The survey showed that 70% of the patients visiting the clinics were female. Majority of the women who were interviewed were housewives.

This high proportion of non-working women is observed

Figure 1. *Gender disparity across clinics*



Source: Author's calculations based on survey data

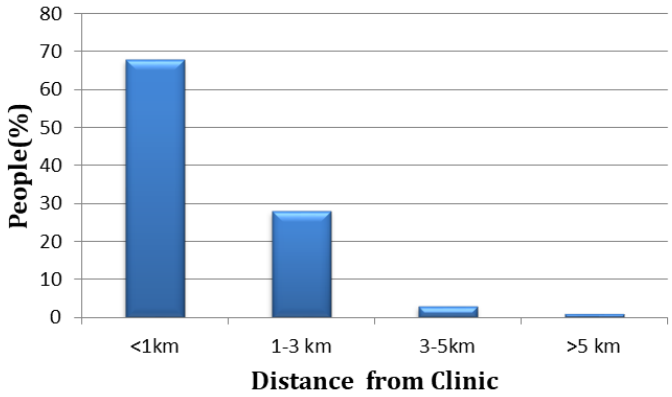
mainly because of possible loss of wage for the day for employed men/women if they decide to visit a Mohalla Clinic. The clinics' open hours are 8am-2pm, which in effect turn out to be only 9am-1pm because the doctors usually tend to arrive later than 8 am. They also close the entry to new patients around 1 pm. Therefore, the timing till 2 accounts for the time spent by the doctor and staff to do their book entries regarding patients and medicines. This short duration makes it unfeasible for working men to visit the clinic. Therefore, most men prefer private clinics (also applicable to some working women).

The timings of the clinic also overlap with school timings. Therefore, unsurprisingly only 2-3 children were encountered during the course of the survey (across all clinics). They were accompanied by their mothers and that also adds to the proportion of women. The inability to bring their children for a check-up owing to the timings was a problem conveyed by many parents.

5.1.2. Distance from Clinics

It was found that 68% of the patients (from the entire sample) live less than a km away from the clinic. This was an expected finding since the concept behind initiating AAMCs was to provide primary health-care very close to people's residence. It indicates that they have been able to fulfil their aim of convenient access to primary care.

Figure 2. *Distance from clinics*

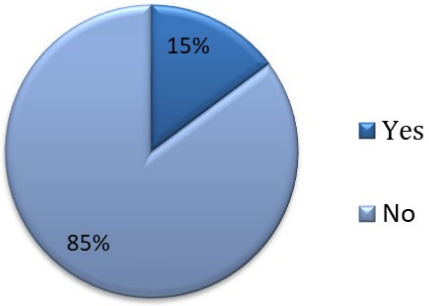


Source: Author's calculations based on survey data

5.1.3. Travel Expenses

Approximately 86% of the patients surveyed do not incur any travel costs and commute to the clinic on foot. This clearly represents that the reduction in distance between residence and clinics has led to a decrease in the cost of travelling to far off clinics for people.

Figure 3. *Travel Expenses*



Source: Author's calculations based on survey data

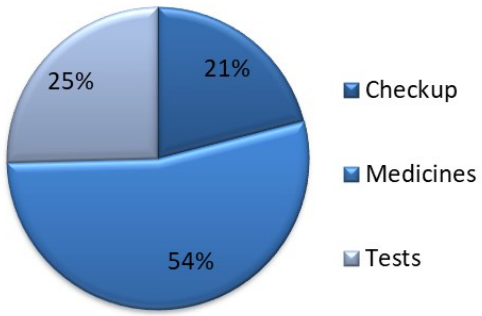
5.1.4. Purpose of Visits

When organising the difference in the number of people visiting to get check-up or tests or merely coming to pick up their medicines, our survey established that nearly 54%

[3] *Source: https://www.census2011.co.in/census/state/districtlist/delhi.html (last accessed August 2018)*

of the patients visited the clinic just to take medicines. The analysis of this particular variable was important to find if the clinics were acting as a simple dispensary rather than healthcare centre.

Figure 4. *Purpose of visits by patients*



Source: Author's calculations based on survey data

Why do we see this articular proportion?

I. Medicines provided at Mohalla Clinics are completely free. This implies that people who earlier might have waited a few days to visit a doctor/chemist and buy costly medicines may now simply visit the clinic at the first sign of sickness. This improves the standard of health of the people who otherwise find it hard to afford expensive healthcare.

II. Time spent per patient is low in these clinics majorly because of two reasons: a) Crowded clinics- When the doctors are attending to a big crowd of patients, the time per patient is reduced and patients could not classify it as getting a proper check up but only a prescription of medicines. The doctors were done with each patient in 5-7 minutes (including registration); b) Ill-informed patients- Most patients visiting these clinics are not well informed about medical complexities. Hence, the doctors might not find it fruitful to explain the sickness/medicines in detail to the patients and rather prefer to move on to the next patient.

III. Patients suffering from a chronic or prolonged disease already possess a subscription of medicines provided to them by the polyclinic/hospital. So they can simply visit a Mohalla Clinic to pick up their medicines, if those medicines are dispensed by the clinic.

IV. A number of patients who are diagnosed at the polyclinics/hospitals are referred to the AAMCs for basic tests and medicines (ex: blood test, thyroid and other common tests). This also results in a lower count of check-ups since the patient has already been checked by the doctor at a polyclinic and the relevant test has been prescribed. The AAMC only needs to carry out the test. Also, According to NSSO data for the year 2014[4], out of the total medical expenditure, around 72% in rural and 68% in urban areas was made for purchasing 'medicine' for non- hospitalised treatment. Along with this, the data collected from our survey revealed that people's private expenditure varied from one locality to another. In some areas people incurred expenditure ranging from 100-500 rupees, and in more well off localities this range was around 500-1000 rupees. Since medicine comprises of a very high proportion of expenditure incurred and the survey shows that most patients come to collect their medicines alone which are completely free at the AAMC, it should lead to a contraction in the healthcare expenditure.

5.1.5. Waiting Time

Waiting time was found to be an important determinant for a lot of people visiting these clinics. It acts as a discouraging factor to some people residing nearby, and it also indicates lower efficiency in functioning.

Figure 5. *Waiting time in North Delhi*

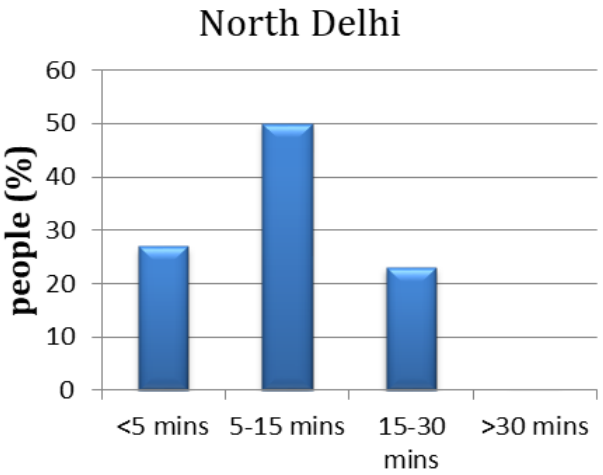
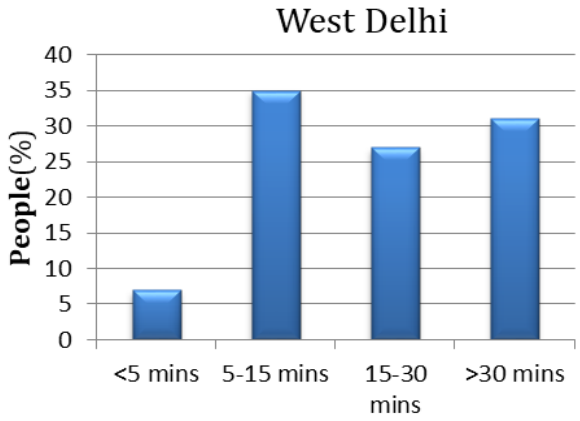


Figure 6. *Waiting time in West Delhi*



Source: Author's calculations based on survey data.

[4] *Source: http://mospi.nic.in/sites/default/files/publication_reports/nss_rep574.pdf (last accessed August 2018)*

There is a big contrast between the waiting time in clinics in the North and West. While 74% of people in north had to wait for less than 15 mins for their turn, the West Delhi clinics had a big proportion (58%) of waiting time exceeding 30 mins. In three of the clinics this time of 30 mins also stretched upto 1 hour.

Why is there a stark difference between the two districts?

Firstly, the population density of West Delhi is approximately thrice than that of North Delhi, which is a major factor contributing towards the higher crowd in the clinics in west. Secondly, there is a lack of appropriate system in the clinics which leads to inefficiency and indiscipline. With the exception of one, all clinics had no token/ parchi system. This when coupled with a big crowd leads to people cutting lines and standing outside doctor's doors. This ultimately stretches the waiting time further. Moreover, clinic timings of 6 hours (which are in effect 4 as stated earlier) are quite inadequate to cater to the observed excess demand in West Delhi. Also, there is an absence of operating hours in the evening.

5.1.6. Three Major Factors Affecting the Satisfaction Level of Patients

In order to assess the satisfaction level of patients, three variables were taken into consideration: communication with doctor, availability of medicines, and the test procedure.

Communication with Doctor

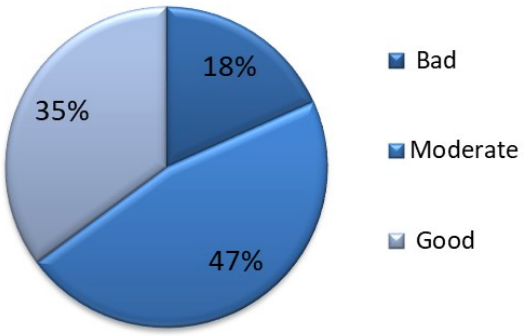
The term "communication with doctor" represents the patients' view of how well the doctor converses with them, attends to their illness, and explains the curative or preventive steps to be taken. This variable is an important determinant of the satisfaction level of a patient as the doctor's attention is of utmost significance to any patient. Hence, good communication should have a positive relationship with the satisfaction level of patients.

As seen in the figures 7, communication with doctor is ranked between good to moderate for 82% of the patients out of the entire sample, with the patients not content with the doctor being a very low proportion. This should drive up the average satisfaction level of patients.

Availability of Medicines

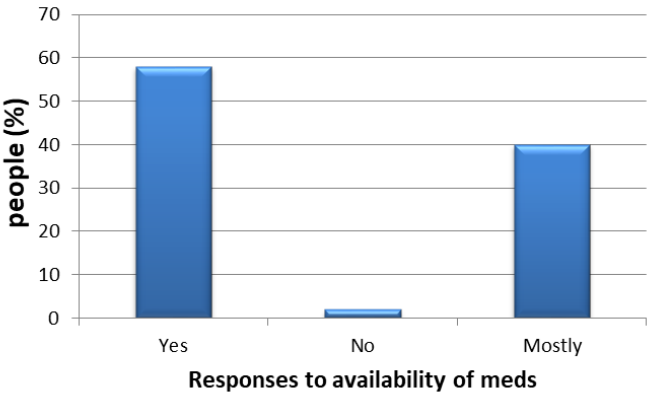
As discussed earlier, majority of patients are visiting these clinics with the purpose of collecting medicines. Unavailability would lead them to purchase medicines from outside, in turn adding to their expenses. Therefore, the availability of these medicines would be positively affecting the satisfaction level of the patients. As the data indicates, the respondents who could not procure their medicines formed only 2% of the total sample. This should imply an increase in overall satisfaction of patients.

Figure 7. *Ranking of communication for the entire sample*



Source: Author's calculations based on survey data

Figure 8. *Overall availability of medicines*



Source: Author's calculations based on survey data

The Procedure for Carrying Out Tests

The test procedure prevailing in these clinics is as follows:

Patients are prescribed a test and given a particular date, which is generally the next day, to submit their sample (the patients already having a prescription for a test from a different health centre can also avail the same facility).

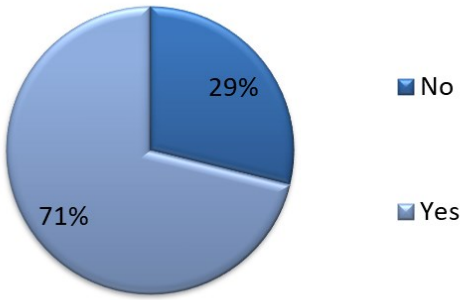
Patients then submit their sample on either the second day, or whichever date is provided to them.

The arrival of test results is not uniform across the clinics. Some clinics may deliver the results on the 4th day, while some others take longer. This implies at least 3 days in total for the test.

This process is deemed lengthy by a number of patients, who conveyed that in order to collect their test reports, they have to go to the clinic everyday to ask for their reports. This results in foregoing work to visit the clinic due to the overlap of timings and hence pushes some patients towards a private facility.

However, a decent proportion of interviewees were still happy given that the tests, which are expensive otherwise, are free of cost at these clinics.

Figure 8. *Response to if it takes more than one day for the tests*



Source: Author's calculations based on survey data

5.1.7. Other Push & Pull Factors[5]

Table 1: *Pull and Push Factors*

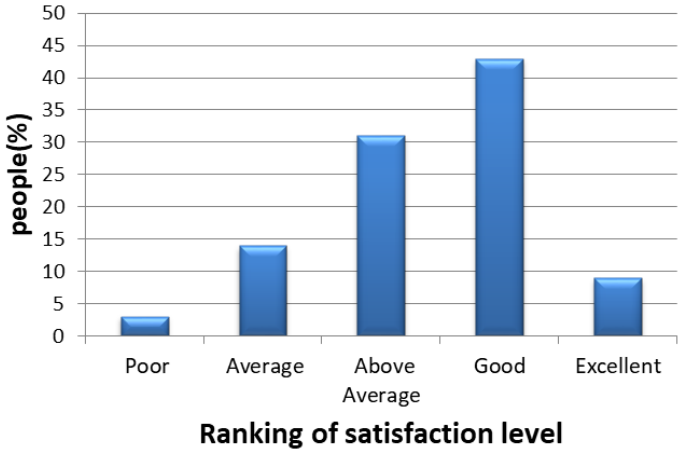
Pull factors	Push factors
1. Distance convenience for patients	1. Inconvenient timings of clinics
2. No/ negligible travel expenses	2. Excess patient crowd
3. Free medicines	3. Inefficient system of tests
4. Expensive treatment in private clinics	4. Lack of hygiene in and around the clinics
5. Too much waiting time spent in hospitals	5. No discipline regarding queues of patients
	6. Rude and undisciplined attendants
	7. No prenatal/antenatal care,
	8. No female doctor
	9. Questionable quality of expensive medicines such as an asthma inhaler
	10. Wastage of common medicines
	11. Small rented accommodations that lead to cramped space, especially in West Delhi.

Source: Author's observation

[5] *Disclaimer: push and pull factors include various observations of the authors alone.*

5.1.8. Satisfaction Level of patients

Figure 9. *Satisfaction level of pateints across all clinics*



Source: Author's calculations based on survey data

The patients who ranked their satisfaction level "above average" are around 83% of the entire sample. This is a very high percentage depicting that the patients visiting these clinics are quite happy with the facilities. The three variables explained before, in addition with the other pull factors in table1 help in understanding the high satisfaction of the respondents. This brings up an important question:

Why the high number of push factors has not significantly brought down the satisfaction level?

As these clinics are set up in the underserved parts of Delhi including slums and JJ clusters, people belonging to these localities generally do not have a lot of options apart from government institutions or local "nukkad" doctors. Hence, in our opinion, they may be unaware of the quality of services, infrastructure, and cleanliness etc. that a clinic should possess. Plus, the demand for healthcare is high in such areas due to the dense population and additional sanitation problems pertaining to them. This excessive demand is being met by Mohalla Clinics. This could be a plausible reason explaining why the push factors specified in table 1 are not greatly affecting their satisfaction.

5.2 Analysis of Sample 2

Out of people interviewed nearby, 71% are aware of Mohalla Clinic. The rest 29% are unaware of its existence. Out of the people aware, 77% do not visit the clinic.

Why a high proportion does not visit the Mohalla Clinic?

I. Majority of people interviewed reported that they were habitual to their regular/family doctor and did not want to switch to a new different doctor.
II. People have a mindset that private centres are superior to government facilities with better doctors and attendance. So if they can afford private, they do not want to try out the AAMC.
III. Some people mentioned that they suffer from a chronic illness and their requirements were fulfilled by their current healthcare centre
IV. Over crowded nature of AAMCs is a major discouragement for the nearby residents .
V. People distrust government facilities and question the quality of the services provided. They, therefore, do not visit the clinic.
VI. Dispensary/ Government Hospital and other government healthcare centres have the same crowd, but given that they provide more facilities, they are preferred in place of AAMCs.
VII. Clinic timings do not suit a majority of people.

6. HOW CAN MOHALLA CLINICS BE STRENGTHENED?

- Female patients have expressed the requirement of a female doctor, if not a gynaecologist, as they would be more comfortable in talking to a woman. Also, the proportion of women is high in the clinic's patient base. Hence, there should be more female doctors appointed.

- Most of the rented accommodations were two room sets which failed to accommodate the excessive crowd in most clinics. The queues of patients extended till outside the clinics. There is a clear need for either an improvement in infrastructure or increasing the concentration of clinics in the localities.

- To tackle the loss of wages during the day incurred by the working class, evening operating hours of the clinic should be introduced.

- A system of monitoring the doctors, staff and the services provided should be put in place as to avoid wastage of resources and ensure professional behaviour. Parchi or token system should be started to ensure discipline among the patients waiting in queues.

- Ensuring cleanliness in and around the clinics and installing dustbins for patients to dispose bandages is an important step to make the clinics better.

- Some patients need to find public washrooms to give their stool tests, and some tend to vomit right outside the clinic. Hence, the facility of a washroom for pa-

patients is very essential.

- Complaint boxes should be installed as mentioned by the website so that patients can express any grievances.

- Postnatal and antenatal care for pregnant women as said by their website is not provided in any clinic and it would be a major benefit for the women living nearby these clinics if it were.

- These clinics can be used to spread awareness regarding sanitation and personal hygiene to the patients and promote prevention more than cure.

- The only information about the addresses of the clinics is available online or through word of mouth. Since most people don't have access to internet, there should be more effort towards increasing awareness of the existence of these clinics.

7. CONCLUSION

Our findings depict that Mohalla Clinics have been a great success in Delhi and have been able to meet their aims to a large extent. The high level of satisfaction and analysis of various pull factors bolsters this initiative of the government and the expansion of this scheme would certainly benefit the community and help uplift the health status of people. The clinics provide all facilities completely free of cost, and travel expenses are negligible. This also brings down the cost burden of healthcare, which is otherwise quite high and distressing for the actual poor. However, looking at the bigger picture they lack some important features which could improve the condition and functioning of these clinics. By incorporating changes such as evening operating hours, more hygienic surroundings, washroom facility, better infrastructure, they could attract a larger patient base. People who currently do not visit the clinic for reasons that are stated by the respondents of sample 2 or other push factors, may be willing to visit if such changes were made. Given the high proportion of women visiting these clinics that require the appointment of more female doctors, it validates how Mohalla Clinics could make themselves better by catering to the needs of such women and employing not only female doctors, but also gynaecologists. Their website also claims that the clinics provide prenatal and antenatal care for pregnant women. However, our survey reveals that no such facility is available. Appointing a gynaecologist, for specific days of the week, could go a long way in improving the health of all women in these localities.

Mohalla Clinics appeal to most people because of the negligible cost of healthcare and an increase in the number of such clinics would make primary healthcare more accessible hence benefitting the underserved population who otherwise find it hard to afford healthcare.

ACKNOWLEDGEMENT

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2018)
▪ Aam Aadmi Mohalla Clinic Website –https://aamaadmiparty.org/aap-government- healthcare-facilities-guide/ (last accessed October 2018)

INEQUALITY & GROWTH : LET'S NOT LEAVE THE POOR BEHIND

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When a country's economy grows, there is potential for the growth to uplift all individuals in that economy. However, when economic growth is accompanied by inequality, it offsets the positive effects of growth and as a result the poor are left stuck at the bottom. This calls for sound policies which can emancipate the poorest quintile through achieving a kind of growth which also mitigates inequality. Income inequality among individuals of the world today is very high. Branko Milanovic finds that the global Gini coefficient is currently 0.62 (Milanovic, 2018), which is approximately the Gini coefficient of South Africa, the fourth most unequal country in the world (hdr.undp.org, 2018).

This astonishingly wide gap between the world's richest and poorest has existed for a while now. A broad quantitative historical view of world inequality is presented in, "Inequality Among World Citizens", 1820–1990 (Bourguignon and Morrisson, 2002). This seminal paper extends other work done in the field of inequality all the way back to the 1820's, and finds that income inequality has in fact worsened over time: the Gini coefficient has increased by 30% and the Theil index[1] has increased by 60% from the early nineteenth until the mid-twentieth century. In the late twentieth century, however, in "Inequality Convergence", Martin Ravallion (2003) finds another interesting phenomenon taking place: there has recently been a convergence in intra-country inequality among nations, but in the direction of a more "equal inequality", towards a Gini of 0.4. Most of this convergence was due to previously egalitarian nations becoming less so. Ravallion hypothesizes that the reason behind this could be the widespread transition to a more market-oriented economy, that is, policies across the globe started to become more and more similar around that time. But since the underlying conditions of these countries were different (in terms of endowments like skill, natural resources, etc), the policies did not reduce inequality much in the countries that were already very unequal, and had an adverse effect on inequality in countries that were egalitarian.

This is why it is a key for policy makers to study the complexity of the problem of inequality before deciding on policies to tackle it. Plus, such policies are imperative since inequality can hinder the development of nations through numerous channels. Firstly, an unequal income distribution denies poorer sections of the population access to basic necessities like healthcare and education. This in turn increases the number of unhealthy and under-skilled citizens in society, and ultimately it is the entire country that pays the price of slow economic growth. Secondly, an unequal society is more likely to be an unhappy society (Powdthavee and Neve, 2017), and therefore less motivated and productive (Oswald, Proto and Sgroi, 2015). In addition to this, as Richard Wilkinson's, "Unhealthy Societies, The Afflictions of Inequality", (Kawachi and Kennedy, 1997) explains, a wider income gap has been found to cause frustration, stress, and family disruption, which then increase the rates of crime, violence, and homicide.

One solution proposed to abate inequality was the Kuznet's inverted U-curve hypothesis. Perhaps the most popular model in the inequality literature, the U-curve predicts that innovations first benefit few individuals, and then trickle down to the masses (Banerjee, Bénabou and Mookherjee, 2011). This rather optimistic perspective of development implies that as developing countries grow; there will be a rise in inequality initially, which can be ignored because the benefits of growth will eventually trickle-down to the masses. However, this view has been widely contested. Thomas Piketty in ,"The Kuznets' Curve, Yesterday and Tomorrow", (Banerjee, Bénabou and Mookherjee, 2011) puts forward the argument that Kuznets misidentified the causes behind the fall in inequality in the first half of the 20th century. Apart from Kuznet's missing pieces of evidence (since his data ended in 1948, he could not consider the fact that inequality decline stopped from World War II onwards), he could not decompose inequality into labour-income and capital income components. Piketty posits that there is empirical evidence to confirm that in developed nations, during the years of great depression, inequality fell because of capital

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[1] *The Theil index is an index similar to the Gini index, but it decomposes inequality into a within-region and across-region component.*

income shocks, rather than due to increase in wage incomes of the poor; and shocks like wars are unlikely to occur to developing countries in the future, making the Kuznet's curve inapplicable to countries undergoing development currently.

On the other hand, Dollar and Kraay in, "Growth is Good for the Poor", (2002) provide evidence of the trickle-down effect on a global scale over the 1950-99 period. Upon measuring how the share of incomes accruing to the poorest quintile varies with average incomes, across a sample of 92 countries, they find that they cannot reject the null hypothesis that incomes of the poor rise equiproportionately with average incomes. They conclude that poverty reducing strategies can be successful even if countries focus solely on growth of average income, because the trickle-down effect of growth will raise incomes of the poor along with rest of the society.

However, basing policy decisions on this conclusion alone may not always be advisable. As Ravallion, in "Growth, Inequality and Poverty: Looking Beyond Averages", (2001) explains, while designing policies it is important to look beyond averages for a variety of reasons. Firstly, cross-country correlations are complicated by data problems, and can hide welfare impacts. So conclusions from such data can be deceptive. Secondly, there is the issue of the effect of gainers and losers cancelling out, leading to the conclusion of "no effect"[2]. As Ravallion puts it, "people are often hurting behind averages" (Ravallion 2001). Another, more noteworthy reason why Dollar and Kraay found no systematic effects on the poor is the fact that starting conditions vary among developing countries, and averaging across them hides systematic effects. Using household survey data for the 1990's for around 50 developing countries, Ravallion tries to uncover the effect of growth on inequality, controlling for initial level of inequality. He finds a negative interaction effect between growth and initial inequality, implying that growth reduces high inequality, but increases inequality where it is initially low. So although growth oriented policies can provide opportunities for the poor, it can happen only if conditions are in place for them to take advantage of those opportunities. Only such growth may be considered "pro-poor". Evidence of pro-poor growth from countries across the world can shed light on what exactly these conditions are.

Ravallion and Datt in, "Why has Economic Growth been more Pro-Poor in Some States of India than Others", (2001) examine pro-poor growth in India and try to determine how much initial conditions really matter when it comes to the differing poverty-reducing impacts of economic growth between states. They first regress growth (measured by the indicators: higher farm yields, higher state development spending, higher urban-and-rural non-farm output and lower inflation) on poverty, and find all of the measures to be poverty reducing in all states. However, the elasticity of poverty[3] to non-farm output varied significantly across states. For example, in West Bengal, a 1% reduction in the headcount index increased non-farm output by 1.24%, while in Bihar it increased output by only 0.26%. They find that the reason for this disparity is the difference in initial conditions across states. Non-farm growth is more pro-poor in states with higher initial farm yields, higher initial female literacy rates, lower infant mortality, lower urban– rural disparities in consumption levels and lower initial landlessness. Literacy rates seemed to be especially important: using simulations, the authors show how if Bihar had Kerala's literacy rate, then the elasticity of the headcount index to non-farm output per person in Bihar would have risen about three-fold, from 0.26% to 0.79%. Therefore policy makers must focus on rural and human resource development and a more egalitarian distribution of land in order to achieve growth that especially benefits the poor. Case studies from Indonesia and Vietnam also support this claim.

P.C. Timmer in, "The Road to Pro-Poor Growth: The Indonesian Experience in Regional Perspective", (2008), analyses Indonesia's growth in the second half of the twentieth century. Since the mid-1960's, the Indonesian government developed a strategy for economic growth with a strong focus on connecting the poor to economic growth. Their pro-poor strategy included three basic levels. First, there was lowering of transactions costs in the economy (especially between rural and urban areas) through government investment in infrastructure - roads, communications networks, market infrastructure and ports, and irrigation and water systems. Lower transaction costs meant easier access for the poor to markets, thereby connecting them to economic growth. Secondly, these were built as labour-intensive public works, which made millions of jobs available to unskilled labourers. Thirdly, investments in human capital– education, public health clinics and family planning centres– further helped connect the poor to economic growth. As a result of these efforts, growth in Indonesia was both rapid and pro-poor. Between 1987 and 1990, the average growth per capita was 5.7% per year and at the same time, incomes of the

[2] *He gives the example of the Russian financial crisis: panel data on household surveys reveal a small increase in the poverty rate of 2%, however this was the result of a large portion of the population falling into poverty and a slightly smaller fraction escaping poverty over the period of the study.*

[3] *The measures of poverty considered by the authors are: headcount index, poverty gap index, and squared poverty gap index.*

bottom quintile grew by 10.8% per year.

While Indonesia focused on the rural and human resource development aspect of pro-poor growth, they stressed little on land redistribution[4]. In Vietnam however, land redistribution was seen to have resulted pro-poor growth, as found in, "Pro-Poor Growth: Concepts and Measurement with Country Case Studies", (Kakwani and Son, 2003). Vietnam's agricultural sector during the late 1980's accounted for roughly 40% of GDP and 70% of total employment. Reforms in this sector around this time focused on dismantling of collective farms and the redistribution of land to peasant households through long-term leases. Growth in this period was pro-poor because it was accompanied by a reduction of inequality, the rural Gini coefficient declined to 26.42% in 1997-98, from 28.86% in 1992-93. In conclusion, while studying solutions to the problem of inequality it is important to keep in mind the averages, but at the same time one must not forget that there is movement behind these averages. Initial conditions (in terms of human and rural resources and land distribution) vary across nations, which is why policies targeted at growth attenuate inequality in some countries and exacerbate it in others. There are also initial conditions other than the ones studied in this paper, such as inclusive institutions, access to credit, etc., which possibly matter just as much in determining the poor's access to growth. There is a need for further in-depth research, at the country level, in order to find the perfect blend of growth enhancing policies which uplift the poor, rather than leave them behind.

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[4] *Timmer says this was because during 1966-67, around 80% of Indonesia was in absolute poverty, and there was effectively nothing to redistribute.*

WELL BEING: THE ULTIMATE GOAL

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Abstract

Economic growth is thought to be the driving force for a higher goal i.e. well-being. We assess how economic growth has an impact on an individual's perception of happiness. The "Easterlin paradox" suggests that there is no link between a society's economic development and its average level of happiness. This paradox has been reassessed based on Gallup World Poll data for 13 years using panel data regression analysis. A positive link between average levels of income and subjective well-being has been found for low and middle income countries. We also study the factors that affect subjective well-being other than income which have been listed out by Cantril (1965), these include health, religion, education among others. These factors need to be studied so that higher levels of well-being of individuals can be achieved. We find that these factors also play a role in the subjective well-being of a person, which varies according to the income category of the country. We find that low and high income countries value the more "quantitative" aspects such as health and education, employment, etc., while middle income countries value the "qualitative" aspects more such as family and personal values.

1. INTRODUCTION

Higher economic growth is considered to be the paramount goal when considering economic policy. Yet this growth is only considered to be a means to achieve an even bigger end i.e. well-being of a country's citizens. In recent years, some people have begun to argue against further trying to improve the material standard of living, claiming that such increases would do little to raise well-being. These arguments are based on the famous "Easterlin paradox" (Easterlin, 1974) which states that "at a point in time both among and within nations, happiness varies directly with income, but over time, happiness does not increase when a country's income increases". What Easterlin essentially argues is that there exists a "satiation point" beyond which increase in income does not affect the happiness of the people.

This conclusion that absolute income has little impact on happiness has far reaching policy implications. If economic growth does little to improve social welfare, then it should not even be the primary goal of government policy.

However, the present literature is based on incomplete evidence about this relationship. The ensuing years have seen an accumulation of cross-country data recording individual life satisfaction and happiness. The recent data suggests that the case for a link between economic development and happiness is quite robust. However, there appears to be a very strong relationship between subjective well-being and income, which holds for middle and low income countries, but not high income countries. It can thus be inferred that after reaching a "threshold" level of income, income does not play a role in increasing the level of satisfaction of an individual.

Having considered the strong relationship between happiness and economic growth, the next question that comes to mind is what else affects happiness other than economic growth? It is a well-established fact that countries in different phases of development value some factors of development more than the others. Cantril identifies certain categories of personal hopes for achieving happiness such as economic, health, family personal values, work situation and social and political values. In this paper, I try to evaluate the effects of these values enumerated in the Gallup World Poll, 2018 to see how they affect happiness levels of people across the world, specifically in three groups of countries- low income, middle income and high income countries.

The next section throws light over the existing literature on the subject. Section III provides the data and method-

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ology used for the study. Section 4 provides the results and interpretations that can be drawn from the study and the final section talks about the conclusions and policy implications of happiness being a function of not just economic growth, but also other aspects that matter to people while considering their happiness.

2. LITERATURE REVIEW

Richard A. Easterlin (Easterlin, 1974) ,in his seminal work through many years, has presented evidence to propose that happiness levels of individuals are not dependent on the economic development of the society that they live in. He has examined the relationship between happiness and GDP both across countries and within individual countries through time when surveying around 53 countries including 17 developed and 9 developing countries, and has found little significant evidence of a link between aggregate income and average happiness. While a section of classical economists propose that focus should be on greatest pleasure for the greatest number, they also accepted the fact that equality is a vital factor and one can increase happiness by increasing equality even in a stagnant society.

However, work on the subject in the ensuing years has provided results that are different. Stevenson and Wolfers (Stevenson & Wolfers, 2008) use recent data on a broader array of countries, and establish a clear positive link between average levels of subjective well-being and GDP per capita across countries, and find no evidence of a satiation point beyond which wealthier countries have no further increases in subjective well-being. They show that the estimated relationship is consistent across many datasets and is similar to the relationship between subject well-being and income observed within countries.

Easterlin also checks for a causal relationship between income and happiness to find that there in fact exists a causal relationship running from income to happiness, which also points in the opposite direction of his own findings. Deaton (Deaton, 2008) finds no evidence of a satiation point. His analysis of the 2006 Gallup World Poll finds a strong relationship between log of GDP and happiness that is, if anything, stronger among high-income countries.

Hence, our main idea is to see what are the factors that affect a person's idea of well-being. To do so, we take factors listed out by Cantril (Cantril, 1965) in his survey where he found that certain hopes and fears are more frequently expressed than others. The broad categories of subjects that affect well-being of an individual as given by Cantril are as follows:

- Economic concerns
- Health and education
- Family
- Personal Values
- Status Quo
- Job/ work situation
- Social Values
- Political

Studies by Veenhoven (1993) have found a correlation between trust in each other and happiness. They found happy people are more loyal, helpful, and moral people have a degree of social interaction and mutual understanding.

Guanyi Ben Li and Yi Lu (2009) has tried to comprise the previous literature on growth and happiness and proposed three possible channels through which happiness can affect growth. The first channel they described is of consumption and investment. According to the theoretical model by Isen & Hermalin (2008), emotion could affect consumption. For e.g. whether to save for rainy days or save on rainy days depends on whether happiness raises or lowers the marginal benefit of consumption. Secondly, past studies like the one by Deeg & Zonneveld (1989) have illustrated that happiness could also predict longevity to a greater extent. Life expectancy affects economic growth: on one hand, short life expectancy causes riskier behavior and lowers investment in physical and human capital while on the other hand longevity also increases population of a given country and thus depresses income per capita as studied by Acemoglu & Johnson (2007). Thirdly, study by Kirchsteiger & Rigotti, (2006) shows that happiness implies generosity and psychologists argue that happiness encourages likability, sociability, and prosocial behavior. We accordingly speculate that a society filled with more happiness would have higher levels of trust, which is argued to affect economic growth.

Recollecting the finding of major studies done in this field, one can say that there is plentiful evidence that suggests the presence of complex relationship between growth and happiness. When taken as a whole the effect might not be that significant but if segregated according to their income levels, then some empirical finding stand out which can elucidate the complex nexus. For example, between 1958-1988 Japan's reported happiness remained almost same while its economy grew by more than five times. Thus, there is a need to study how happiness is impacting growth across varied class of countries and look for plausible conclusions which might not have been looked upon yet.

3. DATA AND METHODOLOGY

3.1. SOURCES OF DATA

Data for this study has been adopted from Gallup World Poll, 2018. The variables studied are as follows:

3.1.1. Dependent Variable

Life Satisfaction

Question- Please imagine a ladder with steps numbered from 0 to 10 in ascending order. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom represents the worst possible life for you- on which step of the ladder would you say you stand at this time, assuming that the higher the step the better you feel about your life? Which step comes closest to the way you feel?

3.1.2. Independent Variables

To test the factors that affect happiness, the explanatory variables are based on Cantril's categorization:

I. Economic:

I. GDP per capita (PPP): The statistics of GDP per capita in purchasing power parity (PPP) at constant 2011 international dollar prices (variable name Log GDP) are from the World Development Indicators (WDI). Wherever values were missing, they have been taken from the Penn World Table 7.1.
II. Economic Conditions: Question- How would you rate economic conditions in this country today- as excellent, good, only fair, or poor?
III. Household Income: Question- Which one of these phrases comes closest to your own feelings about your household income these days?

II. Health and Education:

I. Physical health: Question- Thinking about your life in general, please rate your level of agreement with each of the following using a five-point scale, where 5 means you STRONGLY AGREE and 1 means you STRONGLY DISAGREE. You may choose any of the numbers 1, 2, 3, 4, or 5. Your physical health is near-perfect.
II. Health problems: Question- Do you have any health problems that prevent you from doing any of the things people your age normally can do?
III. Education: Question- What is your highest completed level of education?

III. Family:

I. Children : Question- Do most children in this country have the opportunity to learn and grow every day?
II. Count on to help: Question- If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?

IV. Personal Values:

I. Freedom in Life: Question- In this country, are you satisfied or dissatisfied with your freedom to choose what you do with your life?
II. Importance of religion: Question- Is religion an important part of your daily life?
III. Feel active and productive: Question- Thinking about your life in general, please rate your level of agreement with each of the following using a five-point scale, where 5 means you STRONGLY AGREE and 1 means you STRONGLY DISAGREE. You may choose any of the numbers from 1, 2, 3, 4, 5. In the last seven days, you have felt active and productive every day.
IV. Like what you do: Question- Thinking about your life in general, please rate your level of agreement with each of the following using a five-point scale, where 5 means you STRONGLY AGREE and 1 means you STRONGLY DISAGREE. You may choose any of the numbers 1, 2, 3, 4, or 5. You like what you do every day.
V. Life Evaluation Index: The Life Evaluation Index measures respondents' perceptions of where they stand now and in the future.

V. Status Quo:

I. Standard of living: Question- Are you satisfied or dissatisfied with your standard of living, all the things you can buy and do?
II. Changes in standard of living: Question- Right now, do you feel your standard of living is getting better or getting worse?

VI. Job/Work Situation:

I. Employment status: Respondents fall into one of the six categories of employment based on a combination of answers to a series of questions about employment.

VII. Social Values:

I. Community Index: A component of well-being that includes liking where you live, feeling safe and having pride in your community.

VIII. Political:

I. Confidence in national government: Question– Do you have confidence in national government?

3.2. METHODOLOGY

The countries have been grouped into three income categories: low, middle and high income countries based on United Nation's country classifications as follows:

Table 1: *Classification of countries based on income level*

Group	Number of Countries
Low income	24
Middle income	65
High income	42
Total	131

Source: Based on United Nations Classification

The data is available for 13 years spanning from 2006 to 2018. We have panel data for 131 countries that have further been categorized according to income for a period of 13 years. However, the data is not consistently available for every year for every country i.e. we have an unbalanced panel data. Due to lack of data for certain entries, and unavailability even through secondary sources, those entries have been removed.

3.2.1. ECONOMETRIC MODEL:

Choice of functional form has been adopted from Deaton (2008) and Stevenson and Wolfers (2008). We use log linear form for testing the relationship between well-being and income. Taking log of income reduces the differences in income among the rich and poor countries and bring the two on a comparable scale.

To test for the factors that affect happiness on eighteen variables for various countries across the world, panel data regression analysis has been used. There are three types of models that can be used on panel data:

I. Pooled Regression Model (PRM)- Used when there are no unique attributes of individuals within the measurement set, and no universal effects across time.
II. Random Effects Model (REM)- Used when there are unique, time constant attributes of individuals that are the results of random variation and do not correlate with the individual regressors. This model is adequate if we want to draw inferences about the whole population, not just the examined sample.
III. Fixed Effects model (FEM)- Used when there are unique attributes of individuals that are not the results of random variation and that do not vary across time. This model is adequate if we want to draw inferences only about the examined individuals and is also known as "Least Squares Dummy Variable Model" (LSDVM)

To choose between Fixed Effects Model (FEM) model and Random Effects Model (REM), Hausman test has been used.

Hausman Test:

H_0 = FEM and REM appropriate

H_a = only FEM appropriate

To see whether REM fits the model better or pooled OLS regression, Breusch-Pagan Lagrange multiplier (LM) test has been used.

Breusch-Pagan Lagrange multiplier (LM) test:

H_0 = no panel effects i.e. use pooled OLS

H_a = panel effects i.e. use REM

To test for stationarity, Augmented Dickey-Fuller (ADF) Test has been used. It tests for presence of unit-roots.

ADF Test:

H_0 = Series is not stationary

H_a = Series is stationary

To test for heteroscedasticity, Breusch-Pagan test was used.

Breusch-Pagan Test:

H_0 = Homoscedasticity

H_a = Heteroscedasticity

4. RESULTS

While choosing the appropriate model i.e. pooled OLS or FEM or REM, we run the Breusch-Pagan Lagrange Multiplier test and the Hausman test. The results are as follows:

Table 2: *Results of Breusch-Pagan Lagrange Multiplier test*

Test	p-value			
	All countries	Low Income Countries	Middle Income Countries	High Income Countries
Breusch-Pagan Lagrange Multiplier	< 2.2e-16	7.607e-05	< 2.2e-16	< 2.2e-16
Hausman	0.14683	0.09779	0.07815	0.9654

Source: Author's calculations

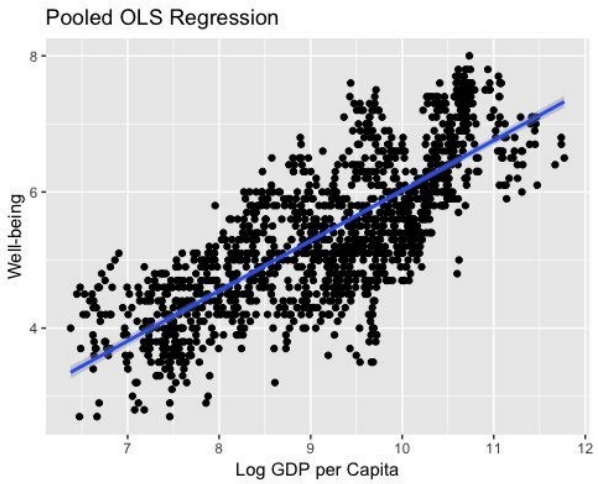
From the table shown in the previous page, it is evident that the LM test statistic rejects the use of pooled OLS model and the Hausman test statistic does not reject the hypothesis that REM should be used. Therefore, further, we only use the random effects model. Results are as follows:

Table 3 *: Results of Random Effects Model*

Dependent variable = well-being	**Random Effects Model (REM)**		
Independent Variables	**Estimate**	**Standard Error**	**p-value**
Intercept	-3.052936	0.530648	8.756e-09 ***
Log GDP per capita	0.120205	0.036079	0.0008632 ***
Economic Conditions	-0.022356	0.075465	0.7670475
Household Income	0.398293	0.087316	5.079e-06 ***
Physical health	-0.220792	0.095439	0.0206990 *
Health problems	-0.163288	0.347376	0.6383119
Education	0.176410	0.114591	0.1236880
Count on to help	-0.319586	0.231382	0.1672171
Children	-0.060969	0.155750	0.6954610
Freedom in Life	-0.359912	0.188066	0.0556518 .
Importance of religion	-0.110623	0.135123	0.4129673
Feel active and productive	0.076201	0.098220	0.4378559
Like what you do	0.055295	0.086116	0.5208076
Life Evaluation Index	3.306303	0.126258	< 2.2e-16 ***
Standard of living	0.416238	0.192038	0.0301980 *
Standard of Living Better	-0.206475	0.103407	0.0458562 *
Employment status	-0.239563	0.192201	0.2126106
Community Index	0.180543	0.095635	0.0590482 .
Confidence in national government	-0.097906	0.135169	0.4688678
R^2	0.92312		
Adjusted R^2	0.91899		
ADF Test (log order = 2)	0.01 (p-value)		
Breusch-Pagan Test	3.94e-07 (p-value)		
Significance codes: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1			

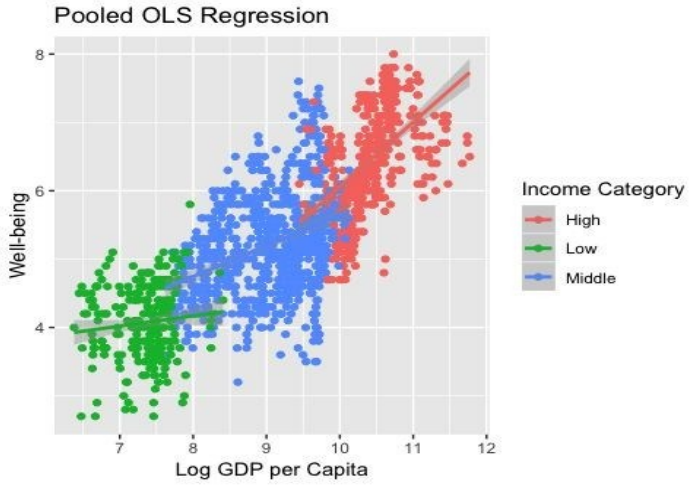
Source: Author's calculations

Figure 1: *REM regression line*



Source: Data analysed by the author

Figure 2: *REM regression line income category*



Source: Data analysed by the author

Table 4: *Panel regression results for low income countries*

Dependent variable = well-being	**Random Effects Model (REM)**		
Independent Variables	**Estimate**	**Standard Error**	**p-value**
Intercept	-3.961054	2.068436	0.0554925
Log GDP per capita	-0.261490	0.152862	0.0871496
Economic Conditions	0.021524	0.277513	0.9381769
Household Income	1.050134	0.300109	0.0004667 ***
Physical health	0.509807	0.246309	0.0384721 *
Health problems	0.104087	1.014808	0.9183061
Education	1.321525	0.350457	0.0001627 ***
Count on to help	-0.386070	0.514894	0.4533722
Children	0.138816	0.439868	0.7523165
Freedom in Life	-0.889176	0.575718	0.1224760
Importance of religion	2.191457	1.122399	0.0508817 .
Feel active and productive	-0.297831	0.254870	0.2425812
Like what you do	0.104852	0.201968	0.6036536
Life Evaluation Index	3.295282	0.458568	6.671e-13 ***
Standard of living	-0.349615	0.555980	0.5294629
Standard of Living Better	0.585662	0.323342	0.0700974 .
Employment status	-0.856649	0.443298	0.0533044 .
Community Index	1.010013	0.238315	2.254e-05 ***
Confidence in national gov-ernment	1.351080	0.573128	0.0184044 *
R^2	0.80855		
Adjusted R^2	0.73363		
ADF Test (log order = 2)	0.01 (p-value)		
Breusch-Pagan Test	3.94e-07 (p-value)		
Significance codes: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1			

Table 5: *Panel regression results for middle income countries*

Dependent variable = well-being	**Random Effects Model (REM)**		
Independent Variables	**Estimate**	**Standard Error**	**p-value**
Intercept	-4.926263	0.874617	1.776e-08 ***
Log GDP per capita	0.189313	0.062559	0.002477 **
Economic Conditions	0.069020	0.107489	0.520801
Household Income	0.614336	0.115289	9.893e-08 ***
Physical health	-0.036459	0.137223	0.790476
Health problems	0.218702	0.486005	0.652710
Education	0.044715	0.178330	0.802014
Count on to help	0.766684	0.312942	0.014289 *
Children	-0.373579	0.216525	0.084466 .
Freedom in Life	-0.124429	0.254044	0.624280
Importance of religion	-0.190111	0.212421	0.0370803 *
Feel active and productive	0.253061	0.145751	0.082519 .
Like what you do	0.091743	0.129747	0.479510
Life Evaluation Index	3.355300	0.174084	< 2.2e-16 ***
Standard of living	0.214437	0.268729	0.424891
Standard of Living Better	-0.232578	0.154372	0.131912
Employment status	0.368816	0.270843	0.173283
Community Index	-0.109554	0.138924	0.430353
Confidence in national government	-0.043662	0.189327	0.817614
R^2	0.89033		
Adjusted R^2	0.87751		
ADF Test (log order = 2)	0.01 (p-value)		
Breusch-Pagan Test	3.94e-07 (p-value)		
Significance codes: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1			

Source: Author's calculation

Table 6: *Panel regression results for high income countries*

Dependent variable = well-being	**Random Effects Model (REM)**		
Independent Variables	**Estimate**	**Standard Error**	**p-value**
Intercept	1.3366815	1.1725802	0.25431
Log GDP per capita	-0.0861021	0.0973336	0.37637
Economic Conditions	0.1283587	0.0738356	0.08213 .
Household Income	0.0648645	0.1032763	0.52996
Physical health	0.2600720	0.1195232	0.02956 *
Health problems	-0.6496224	0.4344938	0.13488
Education	-0.0448496	0.1268924	0.72375
Count on to help	0.2593452	0.3518425	0.46106
Children	0.1054150	0.2121670	0.61930
Freedom in Life	-0.1988061	0.2087671	0.34095
Importance of religion	-0.2993662	0.1370689	0.02896 *
Feel active and productive	-0.0061122	0.1392727	0.96499
Like what you do	0.0614606	0.1457939	0.67335
Life Evaluation Index	2.8372909	0.1391228	< 2.2e-16 ***
Standard of living	0.9543866	0.2407650	7.371e-05 ***
Standard of Living Better	-0.1698876	0.1086712	0.11798
Employment status	0.1993775	0.2401996	0.40651
Community Index	0.1108576	0.1014472	0.27450
Confidence in national government	-0.2632934	0.1339537	0.04935 *
R^2	0.96426		
Adjusted R^2	0.95763		
ADF Test (log order = 2)	0.01 (p-value)		
Breusch-Pagan Test	3.94e-07 (p-value)		
Significance codes: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1			

Source; Author's calculation

The ADF test shows that there are no unit roots present in any of the three cases since the null hypothesis is rejected. The Breusch-Pagan Test shows that there is evidence of heteroscedasticity in the data and therefore, we control for it by using robust covariance matrix to account for it.

Table 7: *Significance of intercept and various independent variables.*

Variable	Low Income Countries	Middle Income Countries	High Income Countries
Intercept	Significant	Significant	Insignificant
Log GDP per capita	Significant	Significant	Insignificant
Economic Conditions	Insignificant	Insignificant	Significant
Household Income	Significant	Significant	Insignificant
Physical health	Significant	Insignificant	Significant
Health problems	Insignificant	Insignificant	Insignificant
Education	Significant	Insignificant	Insignificant
Count on to help	Insignificant	Significant	Insignificant
Children	Insignificant	Significant	Insignificant
Freedom in Life	Insignificant	Insignificant	Insignificant
Importance of religion	Significant	Significant	Significant
Feel active & productive	Insignificant	Significant	Insignificant
Like what you do	Insignificant	Insignificant	Insignificant
Life Evaluation Index	Significant	Significant	Significant
Standard of living	Insignificant	Insignificant	Significant
Standard of Living Better	Significant	Insignificant	Insignificant
Employment status	Significant	Insignificant	Insignificant
Community Index	Significant	Insignificant	Insignificant
Confidence in national government	Significant	Insignificant	Significant

Source; Author's calculations

5. INTERPRETATION

5.1. ECONOMIC

Well-being and economic aspects of life are quite closely related. One or more of these aspects turn out to be significant and have a positive relationship with well-being in all three of the income categories. This goes on to show the close relationship that income and well-being hold. However, it is interesting to note that GDP per capita is not significant in the case of high income countries. It points in the direction of the existence of a satiation point after all. After reaching a threshold level of income, the well-being of individuals in a country moves away from depending on income. However, income is still an important determinant of well-being in low and middle income countries. Since these countries are still in their development phase, income highly influences the well-being of people in these countries. The question concerning economic conditions in the Gallup World Poll pertains to how respondents perceive economic conditions in their country and choose among responses like "excellent", "good", "only fair" and "poor". This condition is significant only for the higher income countries.

5.2. HEALTH AND EDUCATION

Health and education are considered to be two of the most significant basic necessities for building human capabilities, as pointed out by Sen (1999). These are the two goals that most governments try to provide to their citizens. Interestingly, respondents in the middle income countries do not value health and education while considering the well-being. However, health is significant for

low and high income countries. It indicates that although high income countries might have their basic necessities met, they still value health. Mental health is given high levels of importance in more advanced countries and the significance of health in our results supports that. Most low income countries are located in Africa and parts of Asia that suffer from epidemics like cholera, malaria, HIV/AIDS, etc. Well-being is heavily dependent on health in that respect- even a minor improvement in health facilities would drastically improve the well-being of people in these countries.

5.3. FAMILY

This category of factors shows two things- the level of dependence on family and friends and how important children are in a person's life. Only middle income countries value both these aspects while considering well-being. This can be due to the fact that most of these countries are closely knit societies like India, Brazil, etc. They also value children more since they consider them as support for when they get older.

5.4. PERSONAL VALUES

Life evaluation index asks the respondents for where they think they stand in life. It is significant in all three income categories which shows that people's perception of their life is an important determinant of their well-being.

Religion also seems to be an important determinant of well-being. However, it is negatively related to well-being in middle and high income countries. The amount of turmoil with respect to religion that exists in the world today can be credited for such a relationship.

5.5. STATUS QUO

Standard of living and standard of living better both show how much status quo matters to people. It is significant in low and high income country case. Since people in higher income countries have access to amenities therefore status quo matters as well. Similarly, people in low income countries have social and cultural preferences to have a proper social standing.

5.6. JOB/ WORK SITUATION

The scarcity of jobs in lower income countries is extremely high. Even if available, there tend exist a pool of uncertainties. These problems make employment status an important determinant for well-being in the lower income country case.

5.7. SOCIAL VALUES

Community well-being index is only significant in the low income country case. The question that is asked in the survey for this purpose asks the people if they feel safe where they live and if they take pride in their community. Community forms an important part of lives of people in the low income countries and hence shows its significance in our results.

5.8. POLITICAL

Almost all the rich countries in the world today follow democracy as a way of governing its citizens. In a way, democracy and rule of law are assumed to be granted, and is not a question in the people's minds. On the other hand, most poor countries struggle to establish strong democracy and often fall at the hands military coups or dictators. Somewhere in the middle of these two spectrums is the middle income countries. Our results show that confidence in national government is significant only in the low and high income countries.

6. CONCLUSION

Most countries state that their ultimate goal is the well-being of their citizens. Yet, they mostly focus on higher levels of economic growth since it is seen as a driving force to achieve this well-being. Results from our analysis show that income affects well-being only to a certain extent and the other factors have a dominant effect on well-being. We can conclude that higher income leads to higher levels of subjective well-being only up to a certain level of income. As we have seen, income affects well-being only to a certain extent and then countries reach a satiation point after which income itself does not matter, rather conditions in the economy do.

Also, along with economic growth, there are other determining factors that affect happiness and these factors vary according to the level of growth a country falls in. It can be seen that low and high income countries value the more quantitative aspects of well-being i.e. economic aspects, health and education, standard of living, confidence in the national government and community index. On the other hand, middle income countries value the more qualitative aspects while evaluating their well-being like personal values and family values.

The only two factors that matter to all three classes of countries pertain to religion and life evaluation index. It is surprising that religion is a part of this list and rather intuitive that life evaluation is. Religion is part of the debate on the world stage quite often and makes inclusion of religion in this common pool possible.

It is important to study these factors in greater detail because all the countries are transitioning towards higher levels of income. Therefore, in the future countries that today fall in low income category will transition to middle

income and so on. They will pass through these phases of achieving well-being.

If focus is given to achieving higher levels of these factors, they will significantly impact happiness levels, which will lead to happier and more content citizens and ultimately, a more prosperous society.

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THE ECONOMIC THEORY OF MANAGEMENT OF COMMON POOL RESOURCES – AN INCLUSIVE PERSPECTIVE

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Abstract

Examples of Common Pool Resources (CPRs) include fisheries, forests, irrigation systems, and pastures. Since, these CPRs have a constant supply, the total amount of resources available for exploitation remain unchanged and benefits/profits that an individual procures from them is inversely proportional to the population exposed to these resources. The governing of these commons by the communities via the 8-fold model developed by Elinor Ostrom is what is looked at closely via this paper. The paper aims at deconstructing the theory and proving its validity in terms of practical applicability. While we often make arguments against government intervention or privatization in the management of CPR, we need to focus on how viable is it to entrust the local communities with this responsibility. The economic problem of limited resources and unlimited human wants along with the ability of the local community to maintain sustainability of the resources, while satisfying their needs and refraining from overexploitation and propagating personal benefit, will be evaluated here. The importance of formulation of a structure that covers and exceeds the opportunity cost of bare minimum and sustainable utilization of these limited resources is a key element in ensuring appropriate management of the CPRs. The study aims at promoting the establishment of this structure via policy framework. Moreover, the viability of Ostrom's theory and evaluation of the current models developed on the basis of this theory is looked at in the course of this paper. Conclusions will be drawn on the basis of primary data collected from the regions of Tadoba and Corbett.

1. INTRODUCTION

Common pool resources (CPRs) are characterized as resources for which the exclusion of users is difficult (referred to as excludability), and the use of such a resource by one user decreases resource benefits for other users (referred to as subtractability). Herein, exclusion of users essentially implies the isolation of those individuals who have access to the common pool resource from procuring benefits by use of such a resource. Local CPR examples include fisheries, forests, irrigation systems, pastures etc. Global CPR examples include oceans and atmosphere etc. These resources are considerably vulnerable and are subjected to overexploitation by its users.

From the above given definition we can deduce that CPR is a resource whose supply is characterized by constancy. Thus, the total resource available for exploitation remains unchanged and benefits/profits that an individual procures from it is inversely proportional to the population exposed to this resource. Higher the population using the resource implies lower per capita benefit, as the profit then gets divided among a larger denominator. A crucially essential factor associated with these resources is their sustainability. As the supply of these resources is unchanged and demand ever increasing, their optimum and rational use is of utmost importance.

This paper shall work towards understanding the various theories/models that influence policy frameworks. It will further highlight the various measures taken, and interventions involved in ensuring protection and sustainability of CPRs.

The paper further proceeds towards evaluating feasibility and performance of these institutions and measure its

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successes and failures, thus, bringing into focus the theory and model of management of common pool resources as established by the Nobel Prize winner economist- Elinor Ostrom.

2. LITERATURE REVIEW

News-stories about various threatened and degraded natural resources have aroused concern with respect to the management of these common pool resources.

The most popular economic reasoning that backs this problem is namely the "Tragedy of Commons". This phrase has been popularly used to symbolize expected degradation of CPRs when used by individuals based on Garrett Hardin's challenging article in Science (1968). Human wants are ever increasing and each rational individual aims at maximizing his share of profits and maximum utilization of available resources. However, rational decisions of individuals may not necessarily lead to overall rational outcomes. Hardin explains this scenario by using the example of pasture land. Understanding the herder's perspective, he says that each herder benefits from his animal and thus he would work towards maximizing this benefit, as would any rational individual. Similarly, every herder who has access to that pasture land would work towards obtaining maximum benefit from it by means of its capital (which is the animals). This rational act by each individual herder of increasing individual herd with no limits may result in significant degradation of the limited resource of the pasture land. Hardin's model has often been formalized as a prisoner's dilemma under game theory. Consider that the herders are players in the game using a common grazing meadow. Since the grazing meadow is a fixed resource, i.e. its supply is not flexible, the extent to which this resource can be utilized is given by an upper limit. This upper limit is on the number of animals that can graze on the meadow for a season and be well fed at the end of it.

There are thus two approaches/strategies adopted by the herders in response to this limit. Let, the upper limit is denoted by L. The number of herders having access to the meadow is two. According to the first strategy that can be adopted in this case, known as the "corporate strategy", each herder grazes L/2 animals thus procuring equal and adequate benefits. The second strategy here is known as the "defect strategy" wherein the herder does not restrict himself to grazing only L/2 animals. Under this strategy, each herder would maximize the number of animals grazing the meadow in order to procure maximum optimal output. It is thus the latter form of strategy that brings about the threat of overexploitation and non-sustainable use of the common pool resources.

The utilization of the available resource can also take the form of a combined strategy approach where one herder applies the defect strategy in order to maximize individual benefit while the other applies corporate strategy, ensuring overall benefit. However, under this kind of a situation, it is the herder using the corporate strategy who is not making sufficient individual gains. Similar theories were propounded by various other economists, for example- William Forster Lloyd (1977) in 1833, H. Scott Gordon"s (1954) logic in the classic: "The Economic Theory of a Common-Property Research: The Fishery."

In order to overcome exploitation and ensure sustainability, economists like Ophuls and Hardin came up with policy-oriented solutions that involved:

I. Government intervention in the management of common pool resources
II. Privatization of resources

The argument of economists for these policy recommendations is based on the belief that individuals are rational only for oneself, and are inclined towards procuring maximum benefit for themselves while not looking at the bigger picture. Thus, there is a need of an external body that can regulate the management of these resources.

This paper aims at proving the above policy implementations as weak and rather being relatively ineffective. One shall understand how information asymmetry exists when an external body is involved. Moreover, when Hardin's model is formalized as a prisoners' dilemma, the underlying assumption is that there is information asymmetry and that one player (herder) is unaware about the actions of the other.

However, the credibility of this assumption needs to be tested as there is a high degree of information transmission that takes place in communities living close together and using the commons. Via an extensive research, this paper also would bring out the degree of information transmission and the transparency that exists in these communities.

The paper argues on how the two policy solutions for management of CPRs– government intervention and privatization of resources- by themselves are contradictory in nature. The governing of these commons by communities via the 8-fold model developed by Elinor Ostrom is what is looked at closely via this paper.

The eight design principles propounded by Ostrom are given as follows (as per Gari, Newton, Icely and Serrano's paper, (2017)) :

I. Clearly defined boundaries: Individuals or households who have rights to withdraw resource units from the CPR must be clearly defined, as must be the boundaries of the CPR itself.
II. Congruence between appropriation/provision rules and local conditions: Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions.
III. Collective-choice arrangements: Most individuals affected by the operational rules can participate in modifying them.
IV. Monitoring: Monitors who actively audit CPR conditions and appropriate behavior are accountable to the appropriators or are appropriators themselves.
V. Graduated sanctions: Appropriators who violate operational rules are subject to graduated sanctions (depending on the seriousness and context of the offence) by other appropriators, officials accountable to these appropriators, or both.
VI. Conflict-resolution mechanisms: Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.
VII. Minimal recognition of rights to organize: The rights of appropriators to manage their own institutions are not challenged by external governmental authorities.
VIII. Nested enterprises: Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises (for CPR that are parts of larger systems).

Mishra and Kumar's paper (2007) "Institutionalizing Common Pool Resource Management" involves case studies of Pastureland Management in the various villages of Rajasthan helps us in concluding how institutionalizing needs to be a bottom-up process rather than being a top to bottom process. The paper suggests that understanding local needs and dynamics and the approach of the individuals using CPR is of utmost importance while designing an institution for its sustainable existence. Moreover, it is necessary here, to pay attention to the fact that there cannot be one single standard and a single most appropriate solution for geographically scattered places and for a plethora of situations. In other words, each institutional solution is a design influenced by the reactions and responses of the individuals with respect to ensuring the best possible outcome for the community and its resources as a whole. The paper also brings out the failure of allocation of control of a Common Pool Resource in the hands of governing bodies/ heads. It brings out the issues of biased and non-neutral behavior of the panchayats (with respect to the villages of Rajasthan).

Thus, this research paper aims at highlighting the importance of the involvement of individuals in the management of CPRs and their involvement in developing the various institutions for the sustainable use of commons. The most favorable outcomes are achieved when institutions are participatory and voluntary in nature rather than being forceful. Reason beings- cooperation is the essence of management of common pool resources. Nagendra, Ghate, Rao's (2012) paper entitled "Governing India's Common, The Influence of Elinor Ostrom's Ideas", helps one understand that people of the country associate high degree of value and importance to the resources of the nature (i.e., the CPR). This element of sacredness associated to natural resources act as an incentive for its proper and adequate management by the community themselves. Research studies explain how a system of management of the commons would maximize efficiency only when it has the involvement of the individuals using these resources. An essential role of authority here is to provide a nudge/incentive to these individuals via benefits (through policy framework) on protecting and ensuring sustainable use of the commons.

3. HYPOTHESES

I. The economic theory of management of common pool resources is the way towards ensuring sustainability, ecological balance and economic development.
II. Nudge theory and thus incorporation of behavioral economics plays an important role in policy making, in line with Ostrom's theory.
III. Problems of information asymmetry are substantially reduced if not eradicated by the application of this theory.

4. OBJECTIVES

I. To prove the viability of Ostrom"s theory and evaluate current models developed on the basis of this theory.
II. To bring out the significance of nudge theory in policy framework. The study would help uncover metaphorical significance of the statement, made popular by Thaler and Sustein – "Putting fruit at eye level counts as nudge. Banning junk food does not."
III. In addition to this, the paper also aims at the possibility of eliminating other economic problems like information asymmetry by looking at the management of CPRs from Ostrom's perspective.

5. METHODOLOGY

Methodology used in this study would be heavily based

on primary data, supplemented by secondary data. Primary data involves understanding the institutional set ups and community involvement in the field of sustainable use of resources in the forest areas of Tadoba and Corbett. These regions form important areas of analysis and comparison given the stark difference in the management practices in them.

Moreover, understanding these two kinds of management systems enable understanding of design principles. This study will be facilitated by an insightful and meaningful interaction with a naturalist who has worked very closely with the local community for over a decade by being a part of it and understanding its social, economic and cultural backgrounds. He has also been a consultant to the forest department for around a decade and has been a visiting consultant to the government for the management of forest resources and its conservation. The policy programmes, extent of government intervention involved, incentives/nudges that enable sustainable utilization of the limited resources and the institutional set up that has been established with the aim of ensuring sustainable use of commons will be analyzed. The intensity and significance of changes over the various years of management of CPR is evaluated. The various models in the areas of Tadoba and Corbett are then compared to the 8fold model proposed by Elinor Ostrom. The extent of community satisfaction, support and involvement with respect to current conservation and sustainability practices is then evaluated.

This technique enables one to uncover the dynamics of geographically and demographically diverse places and the essence of customization, dynamism and diversity of approaches involved in the management of CPRs in these places.

6. ANALYSIS:

6.1. The geographical set-up in Tadoba

The region of Tadoba has been divided into two segments:

I. Core Region
II. Buffer Region.

The core region lies over an area of 625 square km. This part of the forest is associated with pure conservation, implying that resources here are essentially and ideally untouched and cannot be exploited for the conduct of any activity by any individual. The core region primarily forms the "middle" of the forest. Currently there are two villages comprising the core region of Tadoba.

The second region is the buffer. The buffer region surrounds the core region. It is spread over an area of 1100 square km. Resources of this region are essentially used to meet the requirements of the villages/forest communities living in Tadoba. This area is metaphorically explained as a shield to the core region. The appropriate and sustainable use of resources here by individuals, while keeping the core area untouched, ensures the sustainability of the forest. The number of villages comprising this region is sixty seven.

The geographical set up in Tadoba reflects the presence of Ostrom's DP1 (Design Principle) which is concerned with the presence of clearly defined boundaries which, according to Gari, Newton, Icely and Serrano's (2017) paper, is defined as: "Individuals or households who have rights to withdraw resource units from the CPR must be clearly defined, as must be the boundaries of the CPR itself." Here, the two regions form the clearly defined boundaries. Out of these two regions, the buffer is the clearly defined area that provides access to the villages to extract resources for utilization.

6.2. Institutional set-up in Tadoba

The institutional set-up in Tadoba highlights the presence of Ostrom's DP8 which is the presence of nested enterprises i.e. appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises for CPR that are parts of larger systems. (Gari, Newton, Icely & Serrano, 2017)

The nested institution in Tadoba is an organized structure formed by the forest department. This structure has the following hierarchy (bottom to top):

- Van-Mazdoor: They work at the lowest level, performing every job as required and assigned to them by the people higher up in the hierarchy of management of CPR. Their work is purely clerical in nature and they are employed as permanent workers only after a probation period of 25 years (before that they are mere daily wage workers). The qualification criterion here is education up to grade 12.
- Forest Guard: Above the Van-Mazdoor is the forest guard who is assigned the responsibility of managing the villages inside the forest area. One guard is assigned one village.
- Round Officer (RO): The round officer is allotted regions of management. These regions comprise of the villages falling under the area for which the RO is placed as in- charge. One RO is allotted one region (the magnitude of each region may not necessarily be the same).
- Range Forest Officer (RFO): The RFO is the immediate superior of the RO and is in-charge of various ranges. One RFO is in-charge of one range.

- Assistance Conservator of Forest (ACF): he is the assistance to the DFO (Deputy Forest Officer) and superior to the RFOs.
- Deputy Forest Officer (DFO) [or Deputy Conservator of Forest (DCF) - only when concerned with the CPR management in Maharashtra]: At this level of operation, the significance of the individual's work can be metaphorically compared to that of the prime minister's. The individual allotted this post is the one responsible for complete development and management of activities that are either directly or indirectly contributing towards conservation of the forest community.
- Chief Conservator of Forest (CCF) / Field Director (FD): The CCF/FD has the highest authority pertaining to the conduct of various programs and conservational methodologies in the concerned CPR.

The Conservator of Forest (CF): This is an additional post which has been created in Tadoba. The reason for creation of this post is to solely ensure reduced stature from that of the CCF of the efficient individual who is being transferred here for the required position.

6.3. Institutional Management of CPR in Tadoba

Tadoba has been immensely successful in the management of its forests via a management structure essentially involving people. This progress in Tadoba has been observed essentially during the period from 2012 to 2018. In 2012, Praveen Pardesi, (the then forest secretary) conducted a meeting in Melgad with respect to governance and management of the forest area of Tadoba. This meeting essentially discussed the development of a mechanism that fetched resident's goodwill to the forest department of the region. Hence, new measures were introduced for the same. One of the major regions of development has been the area of tourism. Responsibility for the conduct of activities under this sector has been given to the local communities. This has been instrumental in making the villagers develop a sense of belongingness to the forest and thereby increasing the goodwill of forest department.

Another prominent measure has been the introduction of the Eco-Development Committee (EDC). This committee consists of the people in the villages and those who have been working with the forest department (essentially the round officer). This step taken brings out the presence of Ostrom's DP7 which is the presence of minimal recognition of rights to organize, which according to Gari, Newton, Icely and Serrano's paper (2017) is defined as- "the rights of appropriators to devise their own institutions are not challenged by external government authorities." The committee's mandate ensured that every individual in every village should necessarily have a bank account with complete electronic connectivity. With this there has been an improvement in the compensation system with the individuals being given timely justified compensation. (For example, in cases of deceased cattle etc.).

The DCF Buffer of Tadoba, Gajendra Narwane's incredible work, in simultaneously ensuring sustainable utilization of forest resources and the development of employment opportunities of villagers, thereby ensuring village participation in the process of sustainable development and generating large cumulative revenues for villages. This revenue is transferred into the bank accounts of villages. The money is then used for developmental purposes and to provide loans to villagers in case of emergencies sanctioned by the round officer, with no time constraint on interest payment.

This process of rational sanctioning clearly highlights the presence of Ostrom's DP4 which is the presence of monitoring, which according to Gari, Newton, Icely and Serrano"s paper (2017) is defined as- "Monitors who actively audit CPR conditions and appropriate behavior are accountable to the appropriators or are appropriators themselves."

The major employment generation activities in these forest areas were:

I. Tourism
II. Production of incense sticks. The product under the brand of Cycle Agarbatti is the creation of the people residing in the Tadoba forests.
III. Bamboo Art/ Bamboo Furniture: essentially only the forest department is permitted to sustainably extract bamboo from the forests, making bamboo extraction otherwise illegal. This extracted bamboo is then given to the villagers to be able to work on it and develop articles/commodities. Very recently efforts have been taken to devise and incorporate a scientific method of bamboo extraction, thus making this process legal.
IV. Weaving- for themselves and for supplying outside, essentially to the Tata Group.

These activities have led to a cumulative annual revenue generation of an approximate of rupees sixty crore for the Moharli Range Buffer. This is then employed for developmental purposes and advancements in the educational system.

While, the forest department in Tadoba emanates the presence of Ostrom's DP8 which is given as collective-choice arrangements (as per Gari, Newton, Icely and Serrano"s paper (2017)) is defined as- most individuals affected by operational rules can participate in modifying

them; the forest of Corbett follows a complete opposite approach of conservative management by isolation of the human population leading to them not developing a sense of belongingness towards the forest.

6.4. Understanding the landscape and the mechanism of ensuring sustainability in Corbett

The forests of Corbett lie in a very uniquely shaped landscape that comprises an amalgamation of valleys, rivers, lakes, mountains, deciduous forests, evergreen forests, perennial forests, grasslands etc. This beautifully unique landscape gives the forest a natural advantage in ensuring sustainability.

According to the retrieved primary evidences, it is found that Corbett has a natural advantage; its forest department takes minimum or no efforts in developing a structure of integrated management of resources. The department follows the colonial method of complete isolation. It not just practices isolation but also curbs any form of sustainable forest activity. Activities that pose to be revenue generating and sustainable tourism conducts have also been banned (as has been, till a few years ago, practiced by the Kyari village in Corbett). Thus, the Forest Department of Corbett curbs any form of tourism apart from safaris which ironically is an unsustainable tourism practice. A possible reason for the above is the mere unwillingness of the department to form an institutional set for the development of any such activity.

Keeping people of the forest in complete isolation from its management has caused widespread dissatisfaction and anger amongst the individuals towards authorities. Unlike Tadoba, villagers here not just defy the process of consciously ensuring sustainability but also leave no chance of revolting while facing a conflict of interest with the department. This way there have been cases of them burning down the forest area, thus leading to further depletion of resources.

V) Tadoba v/s Corbett:

While the forests of Tadoba exhibit most of Ostrom's Design Principles via an integrated approach of sustainable management, the forests of Corbett show zero existence of these Design Principles.

The sustainable management of common pool resource of Tadoba can be credited to integrated management approach, whereas the sole reason for the hitherto sustenance of the forests of Corbett owes only to its uniquely shaped landscape. Concern for the issue of sustainable management in Corbett gains a greater impetus when the Forest Department in Tadoba states that its integrated approach is the key towards ensuring that their forest lands do not deplete like those of Corbett. This very evidently explains the seriousness of the situation in Corbett.

7. CONCLUSION

This paper establishes an understanding of the geographical settings of the two forest regions of Tadoba and Corbett, which form the common pool resource under study over here. Via the bifurcation of all forest regions in India into core region and buffer region, one sees a uniform presence of Ostrom's DP1.

This paper also helps understand the presence of most of the Ostrom's design principles in the management of the forest of Tadoba. The integrated management approach in Tadoba has proven to be immensely successful. The success in the management of the commons in Taboda has attracted researchers and members of the other Forest Departments for the purpose of studying its institutional arrangement and working towards the application of the basic model in the forestlands elsewhere in the country.

The institutional arrangement followed by the Forest Department in Tadoba ensures a wholesome approach with the involvement of people in the sustainable use of the resources. While this mechanism might restrict conduct of few activities, at the same time, it will also provide alternative avenues for revenue generation thus ensuring that the people of the forests are satisfied. This satisfaction indeed leads to conscious efforts on part of the individuals in helping the Forest Department governing the resources of the common. This management approach has not just ensured sustainable use of resources, but has also facilitated the generation of huge revenue which has been used to further used for the development of the people of the forests. One of the beneficial applications of these funds can be seen when they are used for classroom development in village schools by incorporating e-learning methods.

In the case of Tadoba, we also notice that people of the village are not given direct management control even though they are indirectly involved in the process of this integrated mechanism. This method can be concluded as being more effective than when the users of the commons are given direct control due to the reason that these individuals have not acquired complete knowledge or expertise in the field of forest management and moreover, they do not have adequate experience of being in a position of power. However, any individual who resides in the forest and desires to work in a position of power can undergo the educational process and appear for the UPSC

exams in India before finally being allotted a position of power depending on the individual‟s capability.

This mechanism also ensures the absence of information asymmetry. This occurs due to the fact that the people in positions of power like the RO and the RFO have been working in this field and geographical area for a reasonable period of time to understand the dynamics of the common pool resource under management.

By drawing a comparison between the institutional settings in Tadoba to that of Corbett's, the paper concludes that a well-planned institutional management is the key towards long term sustainability of common pool resources. Mere reliance on the natural dwellings and advantages will not be beneficial in the long run. There has been a significant presence of Ostrom's DPs in the management mechanism over a long duration to understand and evaluate the progress made in CPR.

Finally, what is understood via this research is that there must be integration and transparency in the management mechanism with information being completely available and understood by every individual who is the user of the resource. This can be facilitated though intensive research papers written in a format that not just merely incorporates scientific terms but are also written in an easily understandable manner enabling individual reading. Methods like those of publishing related information in local languages (which is practiced in Tadoba where the people are kept well informed via articles that are published in Marathi newspapers) should complement the work being presented via research papers in a simplified manner.

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RANDOMIZED CONTROL TRIALS: AN ANALYSIS OF THE METHOD, POTENTIAL SCOPE AND SHORTCOMINGS IN ADDRESSING DEVELOPMENT ISSUES

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1. INTRODUCTION

A Randomized Control Trial[1] (RCT) is a method of experimentation that is used in the Behavioural Sciences. RCTs found its relevance and use in the policy sphere ever since the book 'Poor Economics', authored by Abhijit Banerjee and Esther Duflo (2011), radically influenced the approach to monitoring, learning and evaluation (MLE) of programmes especially in the field of international aid.

This article specifically discusses the applications of RCTs and analyses the structure and policy implications of these experiments by examining a few prominent ones conducted in developing and developed countries; and hence, brings out the gap between experimental context and general policy context. The article also brings out the scope of the usage of RCTs, their shortcomings and possible ways to tackle them.

The aim of this article is to make an argument for RCTs being the preferred method for shaping and evaluating policies. Development economics has started out on its journey of using alternative tools for framing successful policies in a localized setting to tackle the world's biggest issues – education, access to finance, health, inequality and so on. This article discusses one of its tools – RCTs which has experienced relative success.

Randomized control trials refer to an experimental tool used to evaluate policies. There are two groups known as the treatment group and the control group. The treatment group receives the policy intervention and the control group does not. The control group is treated as the counterfactual, i.e. what the outcomes for the participants would have been had they not received the intervention. At the end, the differences in results occurring between the two groups can be attributed to the policy. Some experiments find naturally occurring treatment and control groups, but, in most cases, they have to be created by the researchers. The true impact of the intervention is the difference in outcomes between the treatment group and its counterfactual. This is estimated by measuring the difference in outcomes between treatment and control groups. The average treatment effect refers to the mean difference in outcomes observed between the units assigned to the treatment group and control group.

2.WHY RCTs ARE GAINING IMPORTANCE?

The use of RCTs in public policy has turned out to be a powerful tool to investigate various choices made by individuals. Experimental methodologies have emerged as a mainstream method to design and test interventions especially in developing countries. Application of RCTs does not presuppose the existence of any economic theory, rather it scrutinizes the motives and repercussions of human economic behaviour. Evidence-based policy stemming from such experiments allow for successful changes to be implemented in existing and new interventions.

Governments all over the world implement different kinds of social security and development programs in various sectors. A few of these programs are stalled midway due to political factors, some complete their term and are perceived as wildly successful due to their intentions. For example, the microfinance revolution spread out on a global scale before adequate research could be done about its effectiveness in lifting people out of poverty (Sengupta, 2008). This program received huge amounts of funding and was perceived as successful without comprehensive empirical testing. Few questions remain unanswered like, how many of these reach the intended beneficiaries? How is the data collected in order to announce that a scheme has been successful? RCTs can answer these questions with evidence.

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Let's start with a simple RCT conducted in the USA as documented by the National Bureau of Economic Research.[2] This was conducted to test the differences in those who had opted for Medicaid and those who had not.[3] The results showed that it was better to be uninsured than have Medicaid or that it was better to have private insurance. Various parameters were compared between these two groups such as post-operative death rates, age, illnesses and so on. However, the results were interpreted incorrectly. And in retrospect, the trial was conducted with a major error – selection bias. The two groups are required to be homogenous, which is not the case in this example. The same RCT was conducted again in 2008 in Oregon. This time the participants were chosen through the lottery method to ensure the selection bias does not occur. Therefore, participants in both groups wanted to be a part of the Medicaid program but only half of them were chosen to form the treatment group. The results were vastly different from the previous experiment. Thus, the design of the RCT and sample selection play a crucial role in exhibiting the true effects of a chosen program.

3. DRAWBACKS OF RCTs

Critics often argue that RCTs are expensive and time-consuming. However, the cost outlay is not significantly different from other forms of data collection and analysis. This kind of experimentation allows for comprehensive testing and evaluation. RCTs can help streamline government policies to people who need it the most.

A major drawback of RCTs is biasedness, whether the average treatment effect derived is replicable and a representative of the truth. Post-randomization there should be no other causal factor influencing the treatment group. External validity is the main problem here. A viable solution here is to replicate the trial in multiple settings which would confirm the results. Whether alternate methods such as observation represent the truth better is debatable, because even tools such as regression end up weighting observations differently which may not bear many similarities to the actual population.

Selecting the appropriate treatment group and control group is another issue. A type of omitted variable bias occurs in which individuals who participate in a program when they are systematically different from those who don't, and those differences are correlated with the outcome. This can occurs when the treatment group is made of deliberately (non-randomly), which makes the result grossly liable to unreliability.

The 'transportation' problem in an inter-country situation is relevant. Certain categories of developing countries or developed countries have certain similar landscapes due to which the experiments may be replicated successfully. Adapting an experiment to the local context is something that will benefit from being researched about. The scope of its applicability to diverse real-world settings needs a methodological transformational framework.

4.HOW ARE INTERVENTIONS PLANNED AND IMPLEMENTED?

One method is using reform-oriented interventions to observe changes in outcomes. When we are looking at improving public systems of health or education we can provide monetary incentives or material incentives to observe changes in behaviour. For example, there were particular infections common in children in developing areas, providing deworming tablets improved their general well-being and increased school participation rates in Uganda (2018, Adriko). Absenteeism of government teachers in schools is common in India. Providing nominal monetary incentives for attending more classes was one intervention that was tested. Student and teacher performance improved in this study (2011, Muralidharan).

In order to sustain interventions and translate them into policy, the intervention has to be studied in context to the system. After an intervention has been tested (using flip charts to improve learning outcomes in Kenya), how it is to be incorporated in the wider sense of a policy change must be looked at. In this case, whether to change the curriculum and involve the Kenyan Education board or not?

Another landmark study was conducted in investigating the supposedly transformative effects of microcredit. Comprehensive RCTs conducted in many countries confirmed that this was not the case. (Banerjee & Zinman, 2015) Consumer expenditure decisions improved only marginally and there was no improvement in human development indicators. However, households who borrowed through microfinance institutions tended to have wiser spending decisions by reducing the consumption of 'temptation goods' (entertainment/recreation/ celebrations). This came as surprise to those who were endorsing microfinance primarily based on plain one time collected quantitative data. This shows the importance of studying an issue for a particular period of time account-

[2] *https://www.nber.org/oregon/1.home.html (February 2019)*

[3] *Medicaid is a joint federal-state program that provides health coverage or nursing home coverage to certain categories of low-asset people*

ing for qualitative, behavioural and macroeconomic situations of the participants.

The method of conditional cash transfers has also been widely used in developing countries. The anti-poverty program "Progresa" rolled out in Mexico was also hugely successful. It worked under an RCT framework where mothers were made to encourage their children to attend school and the health center by using conditional cash transfers. That simple idea, which began in the 1990s, has now become a nationwide program in Mexico, benefitting 5.8 million families – a fourth of the country's total population. The initiative improved school enrolment and nutrition rates of children in the country. More than 50 countries have replicated the model so far. The target population was very well defined, mechanisms to select participants were outlined and there were well-timed cash transfers aimed at helping families escape the cycle of poverty. A detailed assessment allowed for the program design to be modified and adapted according to the circumstances of the beneficiaries and context of other country.[4]

Testing multiple treatments across homogenous groups is another method of arriving at the most suitable one. For example, in Canada, various behavioural interventions were tested to decide which one was the most successful in increasing organ donor registration rates (Naylor & Garg, 2013). Examples of RCTs in public disbursement systems are widely discussed in the literature. RCTs have been applied to many other sectors like behavioural finance, job training effectiveness or for designing appropriate nudges.

5. RELEVANCE OF RCTs IN INTERNATIONAL DEVELOPMENT

International aid policy is an important area where RCTs have thrived and grown . The effectiveness of distributing free mosquito nets, chlorine tablets and mass efforts such as these do not always have the intended results. Redistribution efforts often do not actually cause a change in the characteristics of the population. Kevin P Donovan in a recent paper published earlier this year has captured this uprising beautifully. He discusses the social, moral and epistemological dynamics when it comes to the area of international aid:

"Attention to the dynamics of critique in international aid reveals in part how institutions like the World Bank and disciplines like economics achieve their enduring influence."

This essentially explains why alternative behavioural tools like RCTs have gained so much traction. Many aid organizations are responsive to critiques and are willing to adapt their strategies to incorporate what trials like these have yielded. Some fail to engage with alternative critiques, however, this is becoming difficult as we move towards a pluralistic approach to development. Ecological economics, complexity economics, cooperative economics, feminist economics can all use the methodology and frameworks of RCTs. Some of these practitioners are attempting to weave amongst themselves a web of 'legitimating strategies' to create different pockets of value and rationality. They have not yet eradicated indeterminacy, but are exploring the possibility of bringing in certainty into institutional mechanisms on the one hand and continue to investigate uncertainty within a wider policy context.

6.CONCLUSION

Since RCTs represent one of the most rigorous ways of testing cause-effect associations in the policy sphere and prevents us from making misleading assumptions about a population, I argue that it must gain more popularity in urban and rural settings to observe behaviours and guide policy changes. Ethical concerns may be raised, however, with coordinated efforts all over the world, there are several guides to monitor this issue. The onus lies on the conducting agency to be responsible in promoting and protecting good practice and ensuring participants are included, consulted and accurately interpreted. Additionally, in the development context, such concerns can be addressed by involving think tanks and NGOs striving to bring about changes in relevant policy issues. Since its presumed capacity for causal inference has been questioned by a multitude of academics, it is still an increasingly relevant but contested tool. RCTs do not necessarily have to be used in isolation of other qualitative tools. Used in combination, they can innovate research in development.

However, this is not the end result I hope to convey. RCTs by themselves are still used and interpreted very narrowly. Most of the studies make unreasonable assumptions about their population's behaviour and aspirations which end up delivering misleading results. The success of any RCT depends on its design, execution and interpretation. With the number of trials being conducted and papers being published about them, our knowledge base and application strategies will improve. For example, UNICEF has published a detailed catalogue of how RCTs are conducted, what situations they should be conducted in and the conditions for it application. (Sabarwal &

[4] *http://www.worldbank.org/en/news/feature/2014/11/19/un-modelo-de-mexico-para-el-mundo*

& Hoop, 2014) is a technical guide for beginners who want to understand how an RCT is conducted.

Influencing consumers to make environmentally sound decisions, nudging industries to take certain precautions, financial management for vulnerable individuals caught in poverty traps, evaluating the effectiveness of social programs, influencing how laws are enforced, and many other domains can successfully use RCTs as a useful tool in understanding and framing policy.

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EXPLORING THE RELATIONSHIP BETWEEN RAPE AND UNEMPLOYMENT RATES IN 11 DIFFERENT STATES OF INDIA

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Abstract

This paper empirically analyses the relationship between unemployment and rape, using data from 11 states of India. This is undertaken to test whether there is a positive or negative association between unemployment and crime, in particular rape, using the tools of econometrics. Three significant results emerge. First, there exists a negative association between rape and unemployment in India. Second, literacy rates have a positive coefficient with the reasonable interpretation being- literacy increases reported rape not actual rape. Third, positive gender developments have a crucial bearing on violent crimes against women.

1. INTRODUCTION

Crime is a deterrent to social welfare and development. Freedom from violence is an often ignored issue in development studies. If development is concerned with improving the quality of life, the issue of violence should be a major interest of the discipline. It is essential to understand crime trends and factors that drive fluctuations in these trends to expand the study of crime and the influence of economic activities and development on crime trends. This understanding has both substantive and practical implications. Since crime trends are dynamic, gaining insight into mechanisms that drive the variance in crime patterns has significant policy and development implications. There are a number of factors that have been held responsible in explaining changes in crime trends, including economy-based determinants.

Even though the relationship between crime and economic change has had a long history of investigative interest in criminological research, economic factors remain relatively underdeveloped when compared to areas that adhere more closely to criminological concepts. Presumably, criminologists are hesitant to incorporate economic concepts into criminological research due to the perceived complexities inherent to the study of economics. Nonetheless, the economy is a social structure of unequivocal importance, as economic changes can implicate shifts in the behavioural patterns of individuals and subsequently has a strong influence on crime trends. Moreover, using unemployment as an index of economic activity is important since unemployment can have severe psychological effects along with the commensurate loss of income that can have an impact on crime rates.

There is abundant literature available on the quantitative relationship that exists between crime and economic activities. Theoretical studies have predicted both positive and negative associations of crime with economic activities, usually indexed by the aggregate unemployment rate taking into account different crimes across different countries.

The positive and negative association between unemployment rates and crime trends can be understood by the Cantor and Land (1985) model. This model of unemployment and crime separated the impact of an economic downturn (measured by the unemployment rate) into two counteracting effects: the lagged motivational effect and the contemporaneous opportunity effect. The model synthesized two distinct and counterbalancing structural effects of unemployment rates on crime rates: the motivation effect and the opportunity effect. Such a model effectively conjoins criminal motivation theories that relate unemployment to the prevalence of motivated offenders in the population with criminal opportunity theories that relate unemployment to the victim proneness of potential crime targets. The hypothesized relationship between un-

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-employment and crime is not direct but instead mediated through two distinct and counteracting structures: an increase in unemployment has a lagged positive effect on crime through increased motivation and a contemporaneous negative effect on crime because of increased guardianship and reduced opportunity. The theoretical assumption behind the model rests on the notion that to accurately assess the unemployment-crime relationship, the impact of criminal motivation and criminal opportunity need be considered in a common framework.

Cantor and Land developed a structural approach that synthesized the counteracting effects of motivation and opportunity into a single working model. When opportunity dominates motivation, there is a negative association between rape and unemployment which was the result found by Cantor and Land. In particular, a reduction of crime will be associated with increasing unemployment. This negative association will now be termed as the 'opportunity perspective.' The opportunity perspective states that since unemployed individuals are less involved in social activities, their probability of being either victims or perpetrators of violent crime is lower. The aggregate economic conditions can affect the frequency with which individuals are around the home as opposed to at work, in a public place or in transit between home and work. A deteriorating economy means fewer jobs, fewer hours worked, and less time spent in job-related and leisure travel, which in turn decreases suitable targets and increases guardianship, influencing the availability and vulnerability of criminal targets and thus the number of criminal opportunities. The opportunity perspective interprets the level of unemployment as an indication of social inactivity. Since most personal violence victimizations occur outside the home, by spending a greater proportion of time in or near their homes, unemployed persons expose a lower threat of violent behaviour and are less likely to be potential offenders. Other theoretical studies also support this negative association between violent crime and unemployment taking into account the minimized social interactions due to unemployment which reduces criminal opportunity.

The positive association is predicted taking into account the high economic stress, increased income disparities and increase in affinity to social vices associated with increased unemployment that can increase criminal motivation. There is a large body of empirical literature that confirms that unemployment and property crime are positively associated. A case for positive association between rape and unemployment could be predicted by taking into account the fact that rape is often perpetrated by people known to the survivor, with sex offenders being friends, relatives or acquaintances. This means that criminal opportunity would arise even in the absence of social inactivity. The positive association between crime and unemployment can also be understood from the criminal motivational argument. The motivational perspective is the intuitive theory that economists expect to exist in the relationship between unemployment and crime. The criminal motivation argument predicts a positive relationship between crime and poor economic conditions, although there may be two different sources that may drive individuals to commit crime. One source of criminal motivation may result from the psychological effects of unemployment. The inability to obtain or maintain employment while wanting to maintain an adequate level of standard of living may result in frustration. Thus, with deteriorating economic conditions over time, the proportion of the population feeling frustrated and stressed will increase. The overall effect of an increased level of frustration and emotional stress in the population would result in an increased rate of crime. A second source of motivation may be the outcome of a rational individual choice process. That is weighing the costs and benefits of criminal behaviour against legitimate behaviour. This means that when an individual is unemployed the opportunity cost of committing a crime is low.

According to this reasoning, crime would be more likely for unemployed persons, since the perceived total cost of crime is low relative to the total gains from crime. Since a high unemployment rate suggests that there are fewer employment opportunities available the opportunity cost of choosing crime over legitimate work is low, making motivation to commit crimes higher leading to an increase in crimes. The penalty on being caught such as imprisonment would not involve the loss of income from employment or loss of employment in general. In either case, poor economic conditions would be responsible for higher rates of crime since they would lead to an increase in the proportion of the population prone to commit crimes.

There are different kinds of violent crime. This paper in particular analyses the relationship between rape and unemployment to test whether the 'opportunity perspective' dominates for rape. The definition of the crime of rape, according to Section 37 of the Indian Penal Code, is as follows. A man is said to commit rape when sexual intercourse takes place against the consent of the woman or without her consent or when consent is taken under threat or taken when the woman is unable to give consent or with or without her consent when she is under eighteen years of age. The full definition can be found under Appendix A.

In what follows, I present an econometric analysis on the relationship between rape and unemployment, by taking a sample of 11 states in India, namely-Madhya Pradesh, Maharashtra, Uttar Pradesh, Rajasthan, Delhi, Odisha,

Assam, Karnataka, Chattisgarh, Haryana and West Bengal. These states are the top 11 contributors to rape and contribute to almost 80% of the total reported rapes in India. The dependent variable is the rape rate per 1,00,000 women. An OLS estimator is applied and multiple regression undertaken in order to understand this relationship. To further understand gender specific relationships, male and female unemployment rates are taken separately and regressed with respect to the dependent variables. Further independent variables taken are population density and literacy rate. Women Empowerment Index is taken to measure the effect of gender inequality and rape. Economic indicators such as GDP growth and Gross Fixed Capital Formation (GFCF) are also included in the multiple linear regression model to capture the effects of future economic opportunities. Thus, multiple regression analysis is performed to test the following hypothesis:

H_0 : Rape is positively associated with unemployment.

H_a : Rape is negatively associated with unemployment.

2. LITERATURE REVIEW

The empirical relationship between crime and unemployment has been studied in different countries over different time periods, often with varying conclusions.

Becker's (1968) seminal paper developed a theoretical model of crime behaviour to specifically address the role of deteriorating labour markets. He argued that an individual will engage in criminal activities as long as the expected utility of committing crime is greater than the expected utility of engaging in other activities; hence, deteriorations in labour market opportunities make crime relatively more attractive.

Early analysis of the relationship between crime and economic activity includes that of Cook and Zarkin (1985).The authors study economic activity indexed by real GDP with crime. They find that an expansion of economic activity (via a rise in real GDP) leads to a negative impact on property crimes. Wang and Minor (2002) look at the impact of physical access to jobs in the labour market on crime rates. They postulate that neighbourhoods with low job access also tend to be neighbourhoods with high rates of poverty, isolation and lacking other stabilizing factors. This could further have impact not only on economic crimes but also violent crimes. They find that improvements in job accessibility occurring at times of economic expansions lower crime rates, however the relationship is stronger for economics crimes in particular property crimes than for crimes of violence.

Greenberg (1985) applied the criminal motivational perspective to the age distribution of crime in an attempt to explain why youth have the highest rates of crime. He hypothesized that employment has become increasingly important to youth, due to a variety of media influences that have increased the perceived needs of youth, at the same time that access to the adult labour market has been restricted. To obtain material possessions and to engage in leisure activities, youth are dependent on funds provided by their parents and/or own employment. In the absence of parental financial support, youth need to obtain some kind of employment. The problem for youth occurs when they discover that access to jobs in the adult labour market is restricted, thereby preventing them from successfully gaining independent economic support to satisfy their perceived needs. The conflicting trends of increased perceived needs and decreased access to the adult labour market are then expected to increase the level of motivation to crime among youth.

There can be different conclusions when looking at different crimes. Differing results are obtained in particular for violent crimes and property crimes. Violent crimes generally include: homicide, murder, assault, manslaughter, sexual assault, rape, robbery, negligence, endangerment, kidnapping (abduction), extortion, and harassment. Property crime is a crime to obtain money, property, or some other benefit and includes, among other crimes, burglary, larceny, theft, motor vehicle theft, arson, shoplifting, and vandalism. The definitions of these crimes may vary country to country. Glaeser et al (1996) present a model to understand social interactions and different forms of crime which supports the opportunity perspective for violent crime with violent crime decreasing with decrease in social interactions. Britt (1997) in his model studied the crimes of homicide, rape, aggravated assault, robbery, burglary, larceny, and motor vehicle theft. The author discovered the opportunity effect to be significant for each of the crimes at the national level with the exception of motor vehicle theft, which had a negative sign but was not statistically significant. The negative relationship between unemployment and crime due to minimized social interactions is further supported by Levitt (2001).

As mentioned earlier, Cantor and Land (1985) developed a theoretical framework to explain the link between unemployment and crime. They suggested two important links: opportunity and motivation. The motivation hypothesis, similar to the Becker (1968) analysis, suggested that a decrease in viable economic prospects will increase the incentive to engage in crime; so the unemployed are more likely to engage in criminal activities; this suggests a positive relationship between crime and unemployment. The opportunity hypothesis (also referred to as the guardianship hypothesis) on the other hand suggested that a

decrease in economic activity will decrease the availability of criminal targets (the unemployed are also more likely to stay at home thus decreasing their vulnerability to crime, especially property crime), and hence reduce the incentive to engage in crime; this suggests a negative relationship between crime and unemployment. The two effects are expected to work differently based on the type of crime; with the motivation hypothesis being more important for property crime and opportunity hypothesis being relevant for both property and violent crimes (though the effect is still expected to be stronger for the property crimes).

Using US data, Cantor and Land (1985) find evidence for both crime opportunity and crime motivation, especially when considering crimes with a property component (such as robbery, burglary and larceny). Findings of Cantor and Land are confirmed by Philips and Land (2012), using relatively more recent and larger dataset for the US. Raphael and Winter-Ebmer (2001) and Gould et al. (2002), again using US data, report a statistically significant positive relationship between unemployment and property crimes, but not one between unemployment and crimes of violence. In their model of unemployment and crime, Cantor and Land (1985) posited that by altering the conditions of social strain and social control, economic change measured by the national unemployment rate (a conventional indicator of macroeconomic activity) would positively impact criminal motivation (Phillips & Land, 2012; Andresen, 2014). Secondly, economic changes influence the availability of vulnerable targets and, hence, the number of available criminal targets (Phillips & Land, 2012, p. 682). It is important to note that the unemployment-crime relationship set forth by Cantor and Land (1985) is not direct in the sense that unemployment directly impacts crime.

While a large body of evidence comes from the US, there is an expanse of literature available from different countries. Reilly and Witt (1996), Witt et al. (1999) and Wu and Wu (2012) look at the relationship between crime and unemployment for England and Wales; Papps and Winkelmann (2000) for New Zealand; Edmark (2005) and Oster and Agell (2007) for Sweden; Buonanno (1996) for Italy; and Altindag (2012) does a cross country analysis using a country-level panel data from European countries. Andresen (2013) used data from Canadian provinces to look at the relationship between the state of the economy and crime; where the state of the economy is captured by: GDP, unemployment and low income. In all the studies mentioned, a positive association was found mostly when property crimes were considered. However, recent studies have found a negative association. Saridakis and Spengler (2012) examine the link among crime, deterrence and unemployment in Greece over the period 1991–1998, and find a strong negative coefficient, concluding that rising unemployment increases property crimes but not violent crimes, including rape. Yet, when testing for gender-specific measures of unemployment, the coefficient for female unemployment is negative. These results confirm the opportunity perspective. Caruso (2015) empirically analyses the relationship between unemployment and rape in a panel of European regions and finds a strong positive association between rape and unemployment, discrediting the opportunity perspective argument.

The key findings suggest a complex relationship between the state of the economy and crime differing from crime to crime and country to country. The empirical relationship between rape and unemployment seems to be inconclusive with findings varying significantly, and thus the result of any particular set of international studies cannot be assumed to generally apply in all cases. Therefore, this study will examine the relationship for India.

3. DATA AND METHODOLOGY

The data used in this analysis was obtained from a variety of government sources as listed in the table below and data for all variables is state wise data. Here, it is essential to highlight an important caveat before proceeding further. Survey evidence suggests that crimes such as domestic violence, sexual assault, sexual harassment, and stalking are typically under-reported crimes. Thus data quality suffers making the available data incomplete, adversely impacting the quantitative study. The data on the rape cases may be a more accurate indicator of reported rape rates instead of the prevalence of the crime. Moreover, marital rape is not considered a criminal offence in India. Aashish Gupta from the Research Institute for Compassionate Economics (RICE) used 2005 unit-level data of the crime victimisation survey of the National Family Health Survey (NFHS) that included marital rape and recorded actual experiences of crime victims to compare it to the data provided by the National Crime Records Bureau (NCRB) that recorded official crimes recorded by the police. This comparison revealed a gap between the incidence of violence against women and reporting of violence against women. Reporting of violent crimes against women is low due to a number of factors.

These obstacles include inaccessibility or hostility of the police and the criminal justice system, social sanction or the threat of retribution, harassment by insensitive law enforcement agencies, lack of resources to report crimes and pursue cases, poverty, and excessive control in the hands of armed and paramilitary forces in conflict-affected areas where rapes perpetrated by armed officers tend to be higher. Patriarchy, as well as notions of shame and "honour" associated with women's sexuality, com-

bines to make the pursuit of justice even more difficult in incidents of violence against women. Under reporting levels increase when looking at women belonging to marginalised communities such as Muslims, Dalits, Adivasis, or residents of certain areas. Marginalized groups face overwhelming obstacles in obtaining justice. Though there is cause to believe that reporting levels have improved over the years due to increased awareness, the data inconsistency must be highlighted before proceeding further.

In order to make the model more comprehensive and compensate for data inconsistencies a number of economic and population indicators have been included. This helps us to better understand the extent of future and present economic opportunities and demographic characteristics. The rationale for including each variable in the model is given as under. This econometric modelling is consistent with the Cartographic School of Criminology pioneered by Jacques Quételet (a Belgium mathematician) and Andre-Michel Guerre (a French statistician) in Europe during the 1830s and 1840s who included economic and demographic indicators for different crimes- both violent and property.

The rational of including unemployment rate as an explanatory variable has been established and does not require further elaboration.

Population density is defined as the number of persons per square kilometer. Population density is included to test the opportunity perspective. A denser population means a higher likelihood of encounters between individuals.

Literacy rate is taken to measure education. The working definition of literacy since the 1991 Census is the total percentage of the population of an area at a particular time aged seven years or above who can read and write with understanding. Education is a strong predictor for committing crime. Lochner (2004) argues that higher levels of education increase the probability of higher earnings, consequently raising the opportunity costs of crime. Therefore, more intelligent and more educated adults should commit fewer street (unskilled) crimes. Dutta and Hussain (2009) say that education may have a 'civilisational effect' by improving moral stance, thereby leading to a reduction in unlawful activities. However, considering the nature of rape as a highly under reported crime, education may increase crime reporting, since more educated individuals may be more likely to report crime since they are more capable of computing both the personal and social advantages of reporting than less educated people, so determining a positive sign for the coefficient.

Economic indicators of state wise GDP and GFCF have been included in the model to capture past and future economic opportunities. In general, better economic opportunities are expected to be negatively associated with emergence of crime. Several authors, such as Krohn (1978), argue that violent crimes tend to decrease with increasing economic development. The inclusion of economic indicators is consistent with similar studies on crime and unemployment both in international and Indian context. Economic indicators were included by Caruso (2015) while studying the relationship between rape and unemployment in European regions and by Jean Drèze and Reetika Khera (2000) in their study on homicide data.

The Women Empowerment Index (WEI) is calculated for every state using data from the National Family Health

Table 1: *Variables in the model and their respective sources*

Variable	***Classification***	***Abbreviation***	***Year***	***Source***
Rape per 1,00,000 women	Dependent	*raperate*	2016	National Crime Records Bureau
Unemployment Rate	Independent	*unplymntrate*	2011	Population Census Abstract
Population Density	Independent	*popden*	2011	Population Census Abstract
Literacy Rate	Independent	*litrate*	2016	Population Census Abstract
SGDP Growth Rate	Independent	*gdp*	2016	Niti Aayog
GFCF	Independent	*gfcf*	2016	Reserve Bank of India
Women Empowerment Index	Independent	*wei*	2016	National Family Health Survey

Source: Author's classification

every state using data from the National Family Health Survey (NFHS-4) 2015-16. The index uses data from the Health and Family Welfare Ministry under the category 'Women's Empowerment and Gender-Based Violence'. These indicators measure empowerment- measured by participation of women in household decisions, ownership of land, owning and using cell phones and bank account and safety and health- measured by instances of spousal violence, violence during pregnancy and hygiene during menstruation. A higher value means a better rank. For instance, more women having bank accounts is a positive indicator, so data remains as it is. But higher proportion of women reporting to have experienced spousal is worse; hence inverse of this parameter is taken. Lower the rank of a state worse is the inequality. Feminists have long pondered the insidious connection between structural gender inequality and rape. Russell (1975) implicated unequal positions in society and the male monopoly on power as causes of rape when she asserted, "Eradicating rape requires getting rid of the power discrepancy between men and women, because abuse of power flows from unequal power." Similarly, Ellis and Beattie summarized their interpretation of the feminist hypothesis with the following statement: "Deep-rooted social traditions of overwhelming male domination on socio-political and economic activities in a community or society (and the consequent exclusion of women) are the primary and ultimate factor responsible for rape" (1983, 75). Positive social developments (gender equality) thus are predicted to lead to a reduction in rape rates.

4. DESCRIPTIVE STATISTICS

Table 2: *Descriptive statistics variable wise*

Variable	*Mean*	*Standard Devition*	*Min*	*Max*
Rape Cases	2640	1451	1110	4882
Rape per 1,00,000 women	10.67	6.62	2.50	27.62
Unemployment Rate	4.71	2.53	1.5	9.6
Male Unemployment Rate	3.45	1.44	1.3	5.7
Female Unemployment Rate	9.23	5.82	1.8	20.9
Population density	1427.63	3284.42	189	11297
GDP Growth Rate	14.53	3.4	7.55	21.15
GFCF (In ₹ million)	162006	140055	11081	551820
Literacy Rate	74.87	5.74	67.06	86.34
Women Empowerment Index	0.31	0.055	0.23	0.39

Source: Author's calculation

5. GAUSS-MARKOV ASSUMPTIONS

Linear in Parameters

The model is linear in parameters such that the following is true:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k$$

Random Sampling

Data for all variables for all 11 states was collected from state and government data sources. All states that had data available were considered for the analyses conducted, satisfying the condition of random sampling.

No Perfect Collinearity

To assess collinearity between regressors, correlations between all explanatory variables were computed using STATA. The correlation coefficient computations, shown in Appendix B reveal that some correlation does exist between regressors in the model. The correlations exists at levels less than 1.0, thus the no perfect collinearity assumption is satisfied.

Zero Conditional Mean

In the multiple linear regression model, the expected value of the error term is zero, we make this assumption in our analysis.

Homoscedasticity

The variance of the error term in the multiple linear regression model is assumed to be constant throughout and thus satisfying the homoscedasticity assumption.

4. RESULTS

Model 1: Without gender specific estimations

Table 3 *Model 1 results*

Independent Variables	***Estimates***
Unemployment	-0.85** (-2.15)
Population density	0.53** (2.65)
GDP Growth Rate	-0.36** (-4.16)
GFCF	-0.79* (-1.87)
Literacy Rate	3.61** (6.78)
Women Empowerment Index	-3.2** (-4.73)
R squared	.60
p value (F statistics)	.0021

Source: Author's calculation

( ) = t ratios
Statistically significant: **1% *5%

In general the association between rape and unemployment appears to be negative and robust. Coefficients are negative and significant at desirable levels. Put differently, regions with higher level of unemployment have lower incidence of rape, meaning that the opportunity perspective holds true. This is further supplemented with positive coefficients for population density. With a denser population, chances of encounters increases, increasing criminal opportunity, which supplements the opportunity perspective argument. Control variables exhibit the expected signs. GDP growth rate and GFCF are negatively and significantly associated with lower level of rapes. Interpreting them as proxies for future economic growth, it would mean that expectations of economic growth are associated with fewer rapes. Literacy Rate is positively related to rape. As noted above, the reasonable interpretation of this result is that increase in literacy rate does not increase rape but rather 'reported rape'. Reasonably, this would explain the positive association with the dependent variable. Interpreting the Women Empowerment Index, it can be seen that more the gender equality in a state, lower will be the rape rate. The model explains 60% of the variation in rate of rapes. The low p value (F statistics) means that we reject the null hypothesis, thus the opportunity perspective argument or a negative relation holds true.

Model 2: With gender specific estimations

Table 4 *Model 2 results*

Independent Variables	***Estimates***
Male Unemployment Rate	-0.52** (-2.78)
Female Unemployment Rate	0.081 (1.27)
Population density	0.51** (2.63)
GDP Growth Rate	-0.45** (-2.6)
GFCF	-0.801* (-2.01)
Literacy Rate	2.87** (6.03)
Women Empowerment Index	-3.19** (-4.87)
R squared	.62
p value (F statistics)	.0018

Source; Author's calculation

( ) = t ratios
Statistically significant: **1% *5%

Moving from Model 1 to Model 2, I take gender specific unemployment rates into account in order to verify whether or not male and female unemployed have a different impact on level of rape. Here the negative association between rape and unemployment is strongly maintained with male unemployment rates and the opportunity perspective holds true. However, female unemployment rates are not statistically significant and have the wrong sign. The main result that could be claimed is that the male unemployment rate explains the negative association between rape and unemployment entirely. Other variables display the expected behaviour, similar to Model 1. The model explains 62% of the variation in rate of rapes. The low p value means that we reject the null hypothesis, thus the opportunity perspective argument or a negative rela-

-tion holds true.

6. CONCLUSION

The fundamental research question of this paper was to investigate the relationship between rape and unemployment, and understand the relationship based on previous theoretical studies between other forms of violent crime and unemployment. The opportunity perspective argument that predicted a negative relationship between rape and unemployment is proven.

In the past, unemployment has been blamed for rapes in Haryana by members of the legislative assembly; however this is disproved. Since it is seen that it is not the idleness of men due to unemployment that increases rape but in fact when there are lesser social interactions there are lesser rapes. As a policy recommendation to decrease the number of rape cases, it is irrelevant to generate more employment opportunities for males but more important to change patriarchal mind-sets. Often during discussions on the increasing rate of sexual assault in India the actual cause is conveniently ignored. Policy makers often use the argument that the idleness and frustration caused by unemployment leads to rape. These arguments are evidence of the symptomatic treatment of rape culture in India.

The findings of this paper also improve our understanding of rape as a crime and the randomness in the nature of selecting victims, based on volume and frequency of the social activity of the perpetrators. This understanding of rape and unemployment in terms of social activity also helps to deconstruct arguments presented about the nature of the crime. For example, the Chief Minister of Haryana said that most rapes were perpetrated by people known to the survivor and rape cases are merely cases of arguments. If this was true, the criminal motivation argument would have always dominated.

The positive association between rape and literacy is also worth noting. This association appears to be robust across the models estimated. As noted above, ex-ante, the sign was difficult to predict. In sum, the positive association between rape and literacy can be interpreted more accurately as the association between literacy and 'level of reported rape' rather than actual level of rape.

The inclusion of the WEI and the result that positive social developments (gender equality) lead to a reduction in rape makes a case for improving the socio-economic status of women through improvements in access to health services and hygiene, safety from domestic violence, involving women in household decisions, empowerment through ownership of land and amenities like cell phones and financial autonomy.

In general, this work also contributes to throw light on the relationship between economic factors and emergence of different forms of crime. Studying rape separately from other forms of violent crime would help to better explain the relationship between violent behaviours and economic opportunities.

APPENDIX

Appendix A

Definition of rape under Section 37, Indian Penal Code
A man is said to commit "rape" if he:-- (a) penetrates his penis, to any extent, into the vagina, mouth, urethra or anus of a woman or makes her to do so with him or any other person; or (b) inserts, to any extent, any object or a part of the body, not being the penis, into the vagina, the urethra or anus of a woman or makes her to do so with him or any other person; or (c) manipulates any part of the body of a woman so as to cause penetration into the vagina, urethra, anus or any part of body of such woman or makes her to do so with him or any other person; or (d) applies his mouth to the vagina, anus, urethra of a woman or makes her to do so with him or any other person, under the circumstances falling under any of the following seven descriptions:

Firstly.-- Against her will.
Secondly. -- Without her consent.
Thirdly. -- With her consent, when her consent has been obtained by putting her or any person in whom she is interested, in fear of death or of hurt.
Fourthly. -- With her consent, when the man knows that he is not her husband and that her consent is

given because she believes that he is another man to whom she is or believes herself to be lawfully married.
Fifthly.-- With her consent when, at the time of giving such consent, by reason of unsoundness of mind or intoxication or the administration by him personally or through another of any stupefying or unwholesome Substance, she is unable to understand the nature and consequences of that to which she gives consent.
Sixthly. -- With or without her consent, when she is under eighteen years of age.
Seventhly. -- When she is unable to communicate consent.
Exceptions -- 1. A medical procedure or intervention shall not constitute rape; Sexual intercourse or sexual acts by a man with his own wife, the wife not being under fifteen years of age, is not rape.

Appendix B

Test for no perfect collinearity among variables

	unplymntrate	*popden*	*gdp*	*gfcf*	*litrate*
unplymntrate	1				
popden	-0.16	1			
gdp	0.00	0.16	1		
gfcf	-0.37	-0.37	-0.59	1	
litrate	-0.47	0.67	-0.24	0.24	1

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CONTEMPORARY POLICY ISSUES IN THE NON-TRADED AGRICULTURAL SECTOR AND RURAL DISTRESS: A PARTIAL EQUILIBRIUM MODEL

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Abstract

The present paper attempts to build an analytical model in a partial equilibrium framework to explore contemporary policy issues and loan waiver scheme in the non-traded agricultural sector. In doing so, we analyze the effect of credit market reform policy, rise in loan default rate and booming agricultural prospects on credit market exploitation rate and growth of the agricultural sector. We unveil the crucial tradeoff between higher agricultural growth and higher credit market exploitation rate and we conclude that loan waiver is not a panacea for the marginal farmers.

1. INTRODUCTION

Globalization has impacted the world economy in several aspects such as free flow of knowledge, access to capital markets of foreign countries, movement of goods and services across borders etc. Twentieth century had witnessed a list of countries like India, China, Pakistan and Myanmar being liberalized along their macroeconomic and trading front and the liberalization of the overseas trade was expected to improve a docile atmosphere among nations. Opening up of the economy to foreign participants was both welcomed and condemned. Liberalization accompanied with financial market reform policies have no single direct positive effect on macroeconomic indicators of sectoral output growth, employment and prices, as general wisdom suggests. Majority of the people of India are involved in the agricultural sector, 60% of the population is dependent upon agriculture. Agriculture sector provides 27% of the GDP in India. In the context of Indian economy, agriculture sector plays a key and important role in the economic development of the country. However, the sector is burdened with many difficulties ranging from source of credit, production of crops and accessibility to market.

The most common and important problem is the source of credit. The farmers can get their credit from the formal sector and the informal sector. The formal sector includes the co-operative societies, rural banks, commercial banks. In India, during 1950-51 the share of the formal sector in total agricultural credit was 7% and in 1980-81 this share increased to 63%. The contribution of formal credit to agriculture by private sector banks aggregated to Rs. 44,093 crores against the target of Rs. 40,656 crores in the year 2006-07. On the other hand, the informal sector consists of the moneylenders, landlords, traders, zamindars etc. The informal sector constitutes 40% of total credit in the agriculture sector. Most of the times farmers are unable to get credit from the formal sectors as they do not have fixed asset, proper documents etc. Even if they get formal credit the farmers have to bribe the officials of the formal credit agency or there is usual delay in disbursement of credit (Gupta and Chaudhuri, 1997). The failure in the functioning of the formal credit institutions compels farmers to resort to the informal credit market to meet their credit needs. The informal credit market which mainly consists of the zamindars and landlords tend to exploit the farmers by charging higher rates of interest.

The formal and informal credit can be thought off as both substitutes and complements to each other. In case where the farmers gets some fraction of their total credit needs from the institutional credit sources, and borrow the other part of the required credit from informal sources, this implies that both types of credit can be treated as perfect substitutes. In another case, due to delay in disbursement of formal credit in the beginning of the crop cycle farmers borrows from informal credit sources, and they get formal credit disbursed in the middle of the crop-cycles, thus both types of credit are close comple-

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ments.

The objective of the paper is to discuss various credit market reforms such as an increase in institutional credit availability and credit subsidy policy. The paper also analytically looks for the effects of the most debated policy of loan waivers in the agricultural sector and the role of globalization that is conventionally believed as expanding the manufacturing hub of the economy thus escalating the agriculture sector due to linkage effect. The analytical model developed in the paper opposes two conventional beliefs. First, it shows that loan waivers may not be the panacea for small and marginal farmers. Second, improved agricultural prospect due to expansion of the industrial (secondary) sector may not have favourable outcome on the agricultural sector. The results are very much likely, provided the degree of dependency on the informal credit market is relatively high. On the other hand, we concluded that an expansion of the formal credit availability is the first best option to improve the agriculture sector output.

The rest of the paper is structured as follows. In section 2, we review few existing literatures pertinent to the analysis. In section 3, we construct the theoretical model. In section 4 we carry out couple of comparative statics exercises. Section 5, concludes the paper.

2. LITERATURE REVIEW

The effect of globalization on the agricultural sector of the Indian economy has been a constant research among major economic theorists. Gupta and Chaudhari(1997) have shown formal and informal credit sources are substitutes and complements to each other and they have also studied interest rate determination in informal credit market in backward agricultural sector when there is a market for formal credit. Their paper presented an alternative explanation of high informal credit interest rates, for which price and credit subsidy policies of the government are responsible. Marjit, Kar and Sarkar (2004) analyzed the effect of capital mobility across sectors in determining wage inequality. Banerjee and Nag (2015) had discussed the general equilibrium model to examine the implications of financial deregulation i.e. an increase in the supply of formal credit and agricultural trade liberalization.

Marjit (2004) has also claimed that one crucial ingredient in the process of globalization is to remove protectionism from the existing import-competing sectors coupled with creating more liberalized environment for foreign capital so that the economy becomes competitive in the export market. The recent loan waiver scheme has not been theoretically analyzed much. However, an empirical investigation by Banik (2018) suggested that loan waivers would solely benefit the large farmers who own approximately more than 2 hectare of land. In this paper, we offer a theoretical evaluation of loan waivers scheme.

3. THE MODEL

In this section, we attempt to provide an analytical model in a partial equilibrium framework that essentially captures the effects of various reform measures that complements globalization. The baseline assumption is as follows: the economy is a rural economy with only agricultural sector. Agricultural sector uses credit as inputs in its production process. Credit market in the rural economy has a dominant role to play in determining agriculture output and prices of agricultural commodities that farmers receive. In the model, credit is assumed to be of two types, formal and informal credit. Both credits are considered to be perfect substitutes to each other, Gupta and Chaudhari (1997).

Demand for credit is assumed to be a positive function of agriculture output price and a negative function of informal interest rate and positive function of formal interest rate. On the other hand, the supply of formal credit is institutionally determined and is exogenous to the model. The formal interest rate is also given exogenously and is a policy parameter. The supply of informal credit is assumed to be a positive function of informal interest rate and a negative function of probability of loan default or average loan default rate. Thus credit market clears to determine the informal credit interest rate and credit level. In the product market, agricultural output supply is a positive function of formal credit level, the price of output and a negative function of informal interest rate. Demand for agricultural goods is a negative function of its own price and positive function of aggregate income output in the manufacturing sector. Agricultural output market clears to determine the equilibrium output level and equilibrium price. The following symbols are used:

$\bar{Z}_F \rightarrow formal\ credit$

$Z_I \rightarrow informal\ credit$

$\bar{r}_F \rightarrow formal\ credit\ interest\ rate$

$\mu \rightarrow informal\ credit\ interest\ rate$

$P_X \rightarrow price\ of\ agricultural\ goods$

$X \rightarrow output\ in\ agriculture\ sector$

$Y \rightarrow income\ in\ manufacturing\ sector$

$S \rightarrow formal\ credit\ subsidy$

$P_r \rightarrow probability\ of\ loan\ default$

3.1. The moneylender's decision making and the derivation of informal credit supply function

The moneylender derives utility from his expected income (T) and investment in safe asset (N). The moneylenders expected income comprises of amount invested in safe asset and expected income on informal lending (Z_I). Net income from informal lending is aggregate interest in-come net of loan default rate (P_r). Here we assume that 'P_r' is the average rate of loan default.

The utility function of the moneylender is given by-

$$U = f(T, N) \quad (1)$$

The moneylenders is constrained by:

$$T = N + (1 + \mu)(1 - P_r)(\bar{W} - N) \quad (2)$$

Refer to Appendix A for interpretation. The moneylender maximizes eq. (1) subject to constrained in eq. (2). After solving the optimization exercise (See Appendix A) we get the informal credit supply function as-

$$Z_I = Z_I(\mu, P_r) \quad ; Z_I^1 > 0, ; \ Z_I^2 < 0, ; \ Z_I(0, P_r) = 0, \quad ; \ Z_I(\mu, 1) = 0$$

The rural economy is represented by following set of equations (See Appendix B):

$$Z_S = \bar{Z}_F + Z_I(\mu, P_r); \ Z_I^1 > 0, Z_I^2 < 0 \quad ; Z_I(0, P_r) = 0 \ ; \ P_r \in [0,1] \quad (3)$$

$$Z_D = Z_D(\mu, \bar{r}_F(1 - s), P_X) \quad ; Z_D^1 < 0, Z_D^2 > 0, Z_D^3 > 0 \quad (4)$$

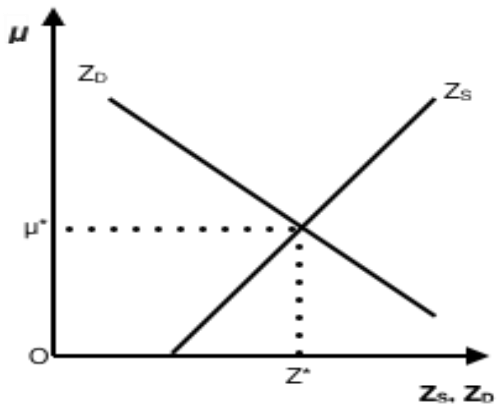
$$X_S = X_S(\bar{Z}_F, P_X, \mu) \quad ; \ X_S^1 > 0, X_S^2 > 0, X_S^3 < 0 \quad (5)$$

$$X_D = X_D(P_X, Y); \ X_D^1 < 0, X_D^2 > 0 \quad (6)$$

The endogenous variables are Z, μ, X, P_X the four equation solves for four unknowns. Policy parameters are P_r, S, Y, and $\bar{Z}_F$.

From eq. (3) we can plot credit supply function (Z_S) and from eq. (4) we can plot credit demand function (Z_D).

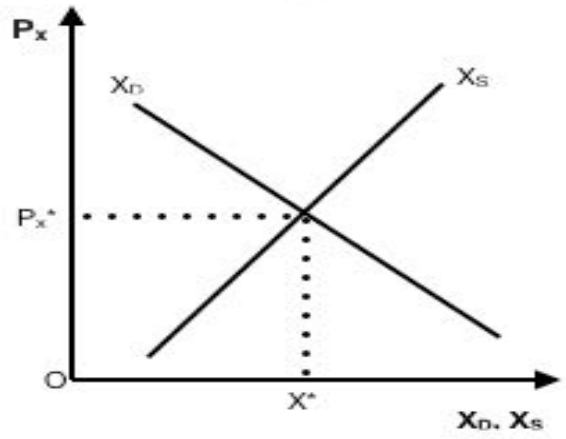
Fig (1)



The supply of credit is positively sloped with a horizontal intercept equal to formal credit level. The demand curve is downward sloping. At equilibrium we obtain μ* and Z*.

Similarly using eq. (5) and eq. (6) we can present the market for agricultural output as under and thus determine the equilibrium price and quantity in the agricultural output market.

Fig (2)



3.2. Credit market exploitation index

The credit market exploitation index is given by relative ratio of informal to formal interest rate i.e.

$$E = \frac{\mu}{\bar{r}_F}$$

An increase in 'μ' implies informal interest rate is relatively higher than formal interest rate and hence a higher credit market exploitation.

4. POLICY ANALYSIS

4.1. Credit Market Reform– Subsidy Reform

Consider a fall in credit subsidy rate as a part of credit market reform policy. A fall in 'S' implies a rise in effective formal interest rate, i.e. it becomes:

$\bar{r_F}(1-s)$.

Thus, demand for informal credit rises, since farmer's substitutes from formal to informal credit. 'Z_D' shifts rightward and 'μ' rises. Since 'μ' rises it follows from Eq. (5) that supply of output 'X_S' falls. Thus, agricultural output falls.

Proposition 1: A credit subsidy reform in terms of fall in institutional credit subsidy leads to contraction of the agricultural sector and increases credit market exploitation rate.

4.2. An Expansion of the Institutional Credit Availability

An institutional credit market reform not only implies a fall in interest subsidy but is also accompanied by an increase in level or availability of formal credit supply. Thus an increase in formal credit supply implies a rise in $\bar{Z_F}$.
It follows from eq. (3) that aggregate credit supply increases, implies a rightward shift of Z_S curve in Fig (1) Given, the demand for credit, informal interest rate falls. These effects in the credit market have a two-fold unidirectional effect on output supply. From eq.(6), increase in $\bar{Z_F}$ leads to increase in output supply and a fall in 'μ' further escalates the output supply. Thus agricultural output supply curve shifts rightward. The following results are immediate.

Proposition 2: An institutional credit reform policy in terms of increase in institutional credit supply leads to expansion of the agricultural sector and fall in credit market exploitation rate.

4.3. The Moral Hazard of Loan Waivers

The risk of loan default has an important role in the rural agricultural sector. It influences the informal credit market through several transmission processes. In this line Basu (1998) has demonstrated various channels through which the risk of loan default affects the credit market. In our present model, we incorporate the risks of loan default in a slightly different fashion.

In case of loan waiver schemes, moral hazard problem arises whereby more productive farmers who can pay off their loan, deliberately default. This has been captured in terms of a rise in loan default rate in our theoretical model. From eq. (3) it implies a decrease in informal credit supply, thus informal interest rate 'μ' rises. As a result, from eq. (5) supply of agricultural output contracts. Thus credit market exploitation rate also rises.

Proposition 3: Loan waivers are not panacea for the small and marginal farmers. Such schemes escalates the credit market exploitation rate and leads to contraction of output in the agriculture sector, thus leading to a overall rural distress. Scheme such as crop insurance; advance weather warning has a crucial role in bringing down the probability of loan default.

4.4. Improved Agriculture Prospect Due to Liberalization

It implies an improvement in agricultural sector's demand that generates from the manufacturing sector. An expansion of the manufacturing sector leads to an increase in demand for agricultural goods, as agricultural goods are used as an intermediate input or final consumption in the manufacturing sector. The demand curve of credit shifts outward, as a result, price rises. From eq. (4) it implies an increase in demand for credit. Thus informal interest rate rises, this in turn implies from eq. (5), the supply of agricultural output falls. Since both demand and supply curve in agricultural output market shifts opposite to each other, the expansion or the contraction of the agricultural sector remains ambiguous.

Proposition 4: Improved agricultural prospect in terms of escalated demand for agricultural commodities from the manufacturing sector have an ambiguous effect on the agricultural sector due to an increase in credit market exploitation rate. Agricultural sector may contract or expand depending on the magnitude of the increase in the informal credit market exploitation rate, thus it opposes the conventional belief of linkage effect.

5. CONCLUSION

In this paper, we have analyzed the role of the agricultural sector in the context of Indian economy after globalization. Towards this, we have reviewed a few models and analyzed their limited applicability under Indian conditions. In so doing, we formulate a partial equilibrium model to explore the credit market linkage with the agricultural sector. The main results of our analysis have been stated in form of propositions above. Firstly, credit subsidy reform in terms of fall in institutional credit subsidy leads to contraction of the agricultural sector and increases credit market exploitation rate.

Thirdly, loan wavers escalates credit market exploitation rate and reduces agricultural output and thus leads to rural distress. Scheme such as crop insurance; advance weather warning has a crucial role in bringing down the probability of loan default. Lastly, improvement in agricultural prospects in terms of increased demand for agricultural commodities by manufacturing sector have an ambiguous effect due to consequent increase in the credit market exploitation rate, which is in contradiction of the conventional belief of linkage effect.

APPENDIX

APPENDIX 1:

$$U = f(T, N) \qquad (A1.1)$$

$$T = N + (1 + \mu)(1 - P_r)(\bar{W} - N) \qquad (A1.2)$$

Where $Z_I = \bar{W}$-N

Max, U=f (T, N)

Subject to $T = N + (1 + \mu)(1 - P_r)(\bar{W} - N)$

L= $f(T, N) + \lambda[T - N - (1 + \mu)(1 - P_r)(\bar{W} - N)]$

$$\frac{\partial L}{\partial T} = \frac{\partial f}{\partial T} + \lambda = 0 \qquad (A1.3)$$

$$\frac{\partial L}{\partial N} = \frac{\partial f}{\partial N} - \lambda + \lambda(1 + \mu)(1 - P_r) = 0 \qquad (A1.4)$$

Dividing (A1.3) and (A1.4)

$$\frac{dN}{dT} = \frac{1}{1 - (1 + \mu)(1 - P_r)}$$

$$-\frac{dN}{dT} = \frac{1}{(1 + \mu)(1 - P_r) - 1} \qquad (A1.5)$$

$$\therefore Z_I = Z_I(\mu, P_r)$$

APPENDIX 2:

We get equality of supply of loan and demand fo loan from eq. (3) and (4),

$$\bar{Z_F} + Z_I(\mu, P_r) = Z_D(\mu, \bar{r_F}(1 - s), P_X) \qquad (A2.1)$$

Totally differentiating Eq. (A2.1) we get:

$$(Z_I^1 - Z_D^1)\, d\mu - Z_D^3\ dP_X = A \qquad (A2.2)$$

$$where, A = Z_D^2\ d\tilde{r}_F - d\bar{Z}_F - Z_I^2\ dP_r$$

Similarly, we get equality of supply of agricultural output and demand from eq. (5) and (6) for agricultural output we get:

$$X_S\left(\bar{Z}_F, P_X, \mu\right) = X_D\left(P_X, Y\right) \qquad (A2.3)$$

Totally differentiating eq.(A2.3) we get

$$X_S^3\, d\mu + \left(X_S^2 - X_D^1\right) dP_X = B \qquad (A2.4)$$

$$where, B = X_D^2\, dY - X_S^1 d\bar{Z}_F$$

Solving (A2.2) and (A2.4) simultaneously we get

$$d\mu = \frac{(X_S^2 - X_D^1)A + Z_D^3 B}{C}$$

$$dP_X = \frac{(Z_I^1 - Z_D^1)B - X_S^3 A}{C}$$

$$where, \qquad C = (Z_I^1 - Z_D^1)(X_S^2 - X_D^1) + Z_D^3 X_S^3$$

Taken, C > 0 as a sufficient condition to solve for the changes in optimal values of the variables. For various comparative static exercises carried out we get the following result subject to the fulfillment of sufficient condition.

$$\left.\begin{array}{ll} when\ \tilde{r}_F > 0, & d\mu > 0\ and\ dP_X > 0 \\ when\ d\bar{Z}_F > 0, & d\mu < 0\ and\ dP_X < 0 \\ when\ dP_{r} > 0, & d\mu > 0\ and\ dP_X > 0 \\ when\ dY > 0, & d\mu > 0\ and\ dP_X > 0 \end{array}\right\}$$

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