

Assessing Occupational Poverty Traps in the Developing World

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Abstract

This paper assesses the empirical relevance of occupational poverty traps, by examining the theoretical predictions that access to credit increases self-employment, reduces wages and affects the poorest of the poor more. Using five randomized controlled trials of microcredit treatment, we find consistent evidence for the poorest of poor prediction, but largely inconsistent evidence for the other predictions.

Table of Contents

1. Introduction	3
2. Literature Review	5
3. Data and Empirical Strategy	12
3.1 India	13
3.2 Ethiopia	14
3.3 Mongolia.....	15
3.4 Mexico.....	16
3.5 Bosnia & Herzegovina.....	17
3.6 Variables and Definition	17
3.7 Models.....	18
4. Results and Discussion	19
5. Conclusion	22
Appendix 1	24
Table 1.....	24
Appendix 2	25
Table 2.....	25
Bibliography.....	26

1. Introduction

Countries with apparently similar potential are at different development levels with one experiencing high growth and the other languishing as a developing economy. So why is it, that one country is “populated by small proprietors, artisans and peasants, while another becomes a nation of entrepreneurs employing industrial workers in large factories?” (Banerjee & Newman 1993, pg. 274). Is it possible that these countries are experiencing an occupational poverty trap, are they in a scenario where the only forms of employment that can be pursued by most people are wage-working jobs with very low returns?

In this paper the aim is to examine if occupational poverty traps do exist in the real world and examine the effects of microcredit access on reducing or eliminating this type of poverty trap. We utilize the proposed theory of occupational poverty traps that various have proposed (Evans & Jovanovic 1989; Banerjee & Newman 1993; Galor & Zeira 1993; Ghatak & Jiang 2002; Bandiera et al. 2015). All these theories are consistent in expressing the notion that in the presence of an imperfect credit market, where individuals who want to borrow cannot borrow and initial level of wealth is below the required amount needed to start a business, there would be some part of the population that would be trapped, they do not want to work as wage workers but they would have to as a source of income. The answer to the theoretical models to eliminate poverty traps would be to increase or allow access to credit in the presence of credit market imperfections.

So we examine five empirical papers that conduct randomized controlled trials in various developing countries and examine their effects on the population (Banerjee et al. 2015; Tarozzi et al. 2015; Attanasio et al. 2015; Angelucci et al. 2015; Augsburg et al. 2015). These papers are consistent in showing that there is little to no impact of microcredit on a number of economic

outcomes, although, all these papers suffer from low take up rates which affects the statistical power of estimates and leaves us only with the intent-to-treat estimates that are reported. For this paper we go another route, theory tells us that the effects on the poorest of the poor should be larger, since they need the treatment the most, and so this is the main focus of the paper. Theory also tells us that across all the treated, dependence on wage income should fall, while self-employment should increase, so we also test this hypothesis utilizing data from all five papers.

We get mixed results for the impacts of the treatment on self-employment and income from wages, for these various countries. For self-employment (hours worked), we get positive effects of microcredit for Bosnia, Mongolia and India, while Ethiopia and Mexico report negative effects. For wages we find positive effect in Ethiopia and Mexico, while they were negative for India, Bosnia and Mongolia, also all the results in both cases are statistically insignificant. So we get some findings that are consistent with our theoretical predictions, but these findings are not robust.

We then test the notion that in a poverty trapped population access to microcredit is more beneficial to the poorest of the poor. Here we have to drop the India and Ethiopia papers due to the lack of a panel data set, when we test the hypothesis of the poorest of the poor effects. The results are consistent with the theoretical predictions that the poorest of the poor should benefit the most from the treatment, we should expect as baseline income decreases there should be a larger increase in self-employment and a larger decrease in income gotten from wage employment. The effects for self employment are negative as predicted for all countries at a level of significance of five per cent, insignificant and one per cent level for Mexico,

Mongolia and Bosnia respectively, showing that the poorest of the poor increased the level of hours worked in self-employment by more as baseline income decreased. Also, our results show the expected positive relationship for wage income, we get two statistically insignificant coefficients for Mexico and Bosnia, with Mongolia having a positive coefficient at a five per cent level of significance. All these results are consistent with the occupational poverty traps theory existing in the presence of imperfect credit market and inadequate initial wealth.

The paper is organized as follows. Section 2 presents the literature review where we discuss the theoretical papers and assess empirical evidence on occupational poverty traps. Section 3 presents the data and empirical strategy used in the paper. Section 4 contains the results presentation, here we interpret the results and make economic interpretations of the data. Section 5 offers some concluding remarks.

2. Literature Review

Here we cover existing research on occupational poverty traps due to liquidity constraints. Firstly, we examine the theoretical notions that have been discussed in various research papers which explain how liquidity constraints can lead to poverty traps. Secondly, this paper looks at various empirical papers that show results on the theoretical notions stated in the papers above, to assess if there is empirical evidence for these theories.

The theory paper by Evans & Jovanovic (1989) constructs a model, in which the population chooses at the beginning of the period whether to work for self or work for someone else. At the end the population receives a return based on the choice of employment he/she has chosen, there is no unemployment and an individual must participate in the labor market. Returns on wage labor (working for someone else) are determined by the agent's level of

education and previous experience, while those of the entrepreneur (working for self) are determined by the entrepreneur's ability and the returns to the capital invested in the business. Returns to entrepreneurship are higher as it is a much riskier investment than being a wage worker, so in a risk neutral environment with no liquidity constraints, everybody wants to work for self.

Liquidity constraints affect only entrepreneurs, because they are the only ones who need capital to start a business. If the entrepreneur's initial wealth is lower than the level of capital needed they have to borrow, which reduces the returns to working for self. Agents can borrow up to the level of initial wealth they are willing to give away as collateral for loans. In the case where capital exceeds the sum of loan and wealth, agents are wage workers which is where the liquidity constraint comes into play, where some people cannot choose entrepreneurship. This is analogous to a barrier to entry into a market due to economies of scale. So one may ask why people who find themselves in these situations do not find people in the same boat and start a business together, a lot of the empirical papers we look have tried to answer this question as they mostly study group-lending programs.

Banerjee & Newman (1993) proposed that poverty traps are caused by initial wealth (bequest) and credit market imperfections. At the beginning of life agents receive a bequest from their parents, which is the agent's level of capital, and every agent has one unit of labor. They assume that at a certain age individuals become economically active and invest both bequest and unit labor endowments. Agents choose an occupation either in subsistence, working for a wage, self-employed and entrepreneurs, here entrepreneurs are defined as employers which differentiates it from self-employment where agents do not hire employees. As in the previous

model, occupational choice is tied to financial constraints, such that we can determine those with enough capital to start a business, and from that infer which group of people are in a poverty trap.

In a single good economy, agents can either consume or invest as capital the single good. There are three technologies available, namely:

- A divisible asset that requires no labor and yields a fixed gross return. Here agents are still left with their labor endowment and can invest in other occupational choices, which we describe as working. However, there is also a choice to remain idle which we refer to as subsistence.
- There is also an indivisible and risky technology e.g. a farm or machine, which requires no special skills to operate. A certain amount of capital and a labor unit is needed, so here the agent is self-employed.
- Finally, there is also a monitoring technology that permits aggregated production. That allows business owners to monitor employees, here the agent is an entrepreneur.

Only agents in self-employment and entrepreneurship need capital and can therefore be affected by capital constraints. An imperfect credit market due to loan default limits borrowing, so initial wealth (bequest plus returns on occupation) affect an individual today and even generations to come. Returns for an entrepreneur is higher than that for a wage-worker, so for both groups, some individuals who need to borrow and cannot due to initial wealth would be trapped. There would be some individuals that would be trapped in poverty and some individuals (agents and future generations) that would move between occupations depending on returns.

Thirdly, the Galor & Zeira (1993) model introduces the notion that individuals may choose to be educated as this affects earnings which both papers above did not discuss. They introduce two forms of technologies differentiated by whether an agent is skilled or unskilled. The skilled technology requires skilled labor and capital, while the unskilled technology only requires unskilled labor. When there are only two periods (young and old), an agent has the choice to invest in human capital when they are young and be skilled and work when old or not invest in human capital and remain unskilled but work both when old and young.

An agent's decision making process is affected by initial wealth, which is the bequest (initial wealth) left for the agent. The returns to being skilled have to be greater than the returns to being an unskilled worker or else everybody would be unskilled. Liquidity constraint comes into play here such that people are rational and want better returns and therefore want to be skilled workers, but this is not possible for everyone, if their level of bequest is not greater or equal to the amount of capital needed to invest in human capital (education). Some people have to borrow, but credit market imperfections limit the amount they can borrow and makes it costly to borrow. So borrowers invest in human capital if and only if initial bequest is greater than a threshold, which is related to the unskilled wage, the skilled wage, the cost of education, the cost of borrowing and the return to saving.

This threshold shows the importance of initial wealth (bequest) on occupational choice and how that translates to income differences amongst groups. The distance from this threshold can determine movement between skilled and unskilled occupational choices across generations. As long as the return on being skilled is greater than that of being unskilled, some

group of people would be stuck in the unskilled labor market, even though they would like to be in the skilled labor market, hence a trap.

Lastly, we discuss Ghatak & Jiang (2002), where the agent's choices are to be either a worker or an entrepreneur. The poverty trap again comes from the initial wealth of the agents in conjunction with credit market imperfections. Individuals default on loans and lenders are aware of this, which leads to loan restrictions and higher interest rates. The return to wages determine whether a borrowing agent remains a wage worker or hires workers.

All these papers have attempted to explain how poverty traps can come about, through occupational choices based on constraints including initial wealth and credit market imperfections and how returns on investment can have cross-generational effects, based on the notion that returns on starting a business are higher than those from working for one. The survey paper of Kraay & McKenzie (2014) summarizes the key mechanisms in a toy model. They state that when credit markets are imperfect and production technology is non-convex (meaning that returns on investment increase with the level of investment), a scenario arises where initial wealth matters, so individuals with high wealth i.e. initial wealth greater than the level of capital needed to start a business, are entrepreneurs while others are in subsistence production. Credit market imperfections and low returns on investment mean that agents are limited in borrowing and they cannot self-fund and so, the returns on investment may never be high enough for them to self-fund business start-ups themselves.

Bandiera et al. (2015) also built a model of occupational constraints, but also test it empirically to see if the theory holds up in practice. They assess how initial wealth actually correlates with the distribution across labor activities in Bangladesh. The model describes two activities

females can partake in, which are casual wage labor and capital intensive labor (livestock rearing). In the model there are labor demand constraints on casual wage activities and there are capital constraints on livestock rearing activities. The poor are stuck in a low asset employment trap, since returns to casual wage labor are constrained by labor demand and returns are lower than capital- intensive activities which are not accessible to those with low initial wealth. Women here chose to participate in casual wage labor, capital intensive activities or both. There are three types of women based on wealth distribution:

1. Wealthiest women: Self-employed and not capital constrained or self-employed and capital constrained.
2. Middle income women: Both activities and capital constrained.
3. Lowest wealth women: Casual labor both labor and capital constrained.

The Targeting the Ultra-Poor program (TUP) provided assets and skills education to the poorest of the poor in Bangladesh. The model predicts that for the labor constraint to be binding, the empirics should find that the intervention does not have any effect on casual labor supply, if anything the effects should be constant across women since the casual labor demand constraint already means we have excess supply. Also for the capital constraint to be binding we must have that self-employment supply does not fall after intervention, however if self-employment labor supply increases, constraint is binding. Also if the returns from skills transfer are greater than the negative wealth effect of asset transfer then the capital constraint is binding. This last part basically states that if the substitution effect of changing occupation is greater than the income effect then there is a capital constraint, which explains why individuals did not make that optimal occupational choice before.

They find both predictions to be true as the results show that the “poor face imperfections in the credit market that keep them in low asset-low employment poverty trap where they only engage in low return and seasonal casual wage labor” (Bandiera et al 2015, pg. 1). They find that there is a village-wide effect of the treatment on outcomes for the non-poor and village-wide growth in the level of savings and capital accumulation.

Lybbert et al. (2004) examine multiple stable wealth equilibria among pastoralists in Ethiopia. They find that, “Lowest quartile herders face an almost 90% probability... of remaining trapped in that quartile the next year and a slightly higher probability of 92% of remaining in this quartile for the next ten years” (Lybbert et al 2004, pg. 769). At the same time, the top quartile seems stable as less than 3% fall into the lower two quartiles within the year and 9% within the next ten years, suggesting the presence of a poverty trap for some people.

Kraay & McKenzie (2014) however have doubts about the empirical relevance of poverty traps. With respect to Lybbert et al. (2004) they suggest migration as a solution to the poverty trap phenomenon. They discuss various forms of poverty traps from saving-based poverty traps to geographic poverty traps. For this paper we focus on lumpy investments paired with borrowing constraints, and they give four general reasons why these types of poverty traps may not exist, namely:

- Firstly, the data suggest that the amount of capital needed as initial investment to start an organization is not as large as predicted, it shows low levels or even zero capital investment needed.

- In the presence of various production technologies and high variation in different start up costs we have a convex production technology and this therefore eliminates the non-convex technology argument.
- Many production technology options are available to individuals, so they may be able to choose a combination of them and then bootstrap their way out of poverty, with higher returns on low-level investments.
- Also in reality many small scale organizations have high returns to capital in contrast to the hypothesis that the larger the investment the larger the returns.

All these theoretical notions and empirical evidence suggest that if the concept of poverty traps are real, it must be that some people cannot borrow, or that there is a borrowing limit for the individual due to collateral limitations. If an organization or in this case a microfinance institution (MFI) operated a lending program, we should be able to assess if this has an effect on moving people out of poverty through occupational (technology) choice. In this paper we assess this by examining various RCTs (randomized controlled trials) of microcredit programs.

3. Data and Empirical Strategy

In this section we test the theoretical predictions using empirical data. We utilize RCT (randomized controlled trials) data when microcredit is a treatment, in the presence of the hypothesized poverty trap. We do this because based on theory, poverty traps caused by occupational choice constraints (capital market imperfections and initial wealth constraint), can be overcome through the availability of credit.

The theories above discussed various predictions for an agent stuck in an occupational poverty trap. These theories suggest that:

1. When there is an increase in access to credit (so we do not have capital market imperfections), we expect would-be entrepreneurs who did not have initial wealth greater than or equal to the needed level of capital to make the occupational decision of self-employment or entrepreneurship.
2. We should also expect that microcredit has negative effects on wage income. As the treatment would be expected to affect agents who want to to be entrepreneurs or self-employers and for that reason after treatment they leave wage-work.
3. Another prediction is that the poorest people within the group should be affected the most by the introduction of microcredit. This is because the poorest individuals would suffer most from the imperfect credit market and initial wealth constraint.

As stated above we use five randomized trials of microfinance published in a single issue of *American Economic Journal: Applied*. These papers conduct RCTs in India, Ethiopia, Mongolia, Mexico and Bosnia and Herzegovina (Banerjee et al. 2015; Tarozzi et al. 2015; Attanasio et al. 2015; Angelucci et al. 2015; Augsburg et al. 2015). We now discuss the context of these papers, the randomized controlled trials and how they help in our research.

3.1 India

The treatment here is offered by an MFI called Spandana in a state in India called Hyderabad. Spandana normally offered what the paper describes as canonical group-loans. Spandana defined a group as having a range of six to ten members, there was a total of 25 to 45 groups in the study. There is joint-responsibility of loans within a group, with Rs. 10, 000 (USD\$200, World Bank exchange rates) the largest possible amount the group can borrow at the time of the first loan. After repayment of initial borrowing the group can then borrow within the range

of Rs. 10,000 to Rs. 12,000 (USD\$200 to USD\$240), the loan amount increases after every repayment to an absolute maximum of Rs. 20,000 (USD\$400).

There were certain criteria Spandana put in place to allow for individuals to be part of the program, namely: a) female, b) aged between 18 to 59, c) have resided in the same area for at least one year, d) valid identification and residential proof, e) 80% of the women in each group must own their own home and f) there is no need for collateral. The treatment was applied in 120 neighborhoods in Hyderabad, where no MFIs were available and the borrowers were deemed desirable. The initial group consisted of 2,800 households as of 2005, but it was reported that the participants were not representative of the sample population so we do not have panel data, as the same households were not surveyed at endline in 2008 and 2010. There were a total of 104 areas in Hyderabad selected into the program and 52 of these areas were treated. Observed outcomes varied for different subjects due to attrition in data, however there were a total of 7,000 observation responses gotten from each individual in both the control and treatment groups (Banerjee et al. 2015).

3.2 Ethiopia

Here the intervention includes microcredit and a family planning program (FPP), the aim is to find out if the usage of both treatments together as opposed to apart has a larger impact on contraceptive usage. So we have three treatment groups: microcredit only, FPP only or both, and the control group gets neither. The treatments were conducted in Amhara and Oromiya, with two MFIs, namely: Amhara Credit & Savings Institute (ACSI) and Oromiya Credit & Savings & Share Company (OCSSC) respectively. The treatment included small loans, targeted women and was both open to groups and individuals, but most participants took joint-liability loans and no collateral were required.

In rural western Ethiopia there are 133 administrative units (Kebeles or Peasant Associations (PA's) i.e. the smallest local unit of government in Ethiopia which comprised of a number of villages) in the Oromiya and Amhara region. The treatments included Family Planning Program (FPP) and the expansion of microcredit, both programs are supported by the David & Lucille Packard Foundation Population Program. In Oromiya the FPP treatment was provided by Oromiya Development Association (ODA) and in Amhara it was the Amhara Development Association (ADA).

In Oromiya there were 191 villages, identified in 78 PA's where OCSSC and ODA planned to expand, while, in Amhara 162 villages were identified in 55 PA's where ACSI and ADA planned to expand. In each of the 133 PA's, if there were more than 400 villages, 3 villages were selected at random and when less than 400 villages, 2 were selected at random. The baseline survey was conducted from January till May 2003, with a total of 6,412 households interviewed (3,196 in Amhara and 3,216 in Oromiya) and the endline survey conducted in 2006, having a cross-section of an independent sample population in both villages, for this reason panel data is not available in this paper. Oromiya's randomly selected 78 PA's [microcredit (20 PA's), FPP (18 PA's), both (20 PA's) and neither (20 PA's) while Amhara's had 55 PA's that were randomly selected [microcredit (14 PA's), FPP (13 PA's), both (15 PA's) and neither (13 PA's)], for the purpose of this paper we utilized the microcredit intervention as our treatment. Randomization occurred at the PA's level so households and villages in the same PA's were given the same treatment (Tarozzi et al. 2015).

3.3 Mongolia

The joint-liability microcredit program was conducted by XacBank in conjunction with the Mongolian Women's Federation (MFW) (Attanasio et al. 2015). The loans target women and

they are small in nature. The target population consists of relatively poor Mongolian women who had been previously excluded from access to loans. The study was conducted in Northern Mongolia from 2008.

The treatment included both individual and group loans. Group loans were more popular and members within the group had joint-liability for loans, so group loans were terminated if a group member missed payment and the largest initial borrowings could not exceed MNT 500,000 (\$USD 435). The experiment took place in 40 soum centers (villages) across five aimags (provinces) in Northern Mongolia.

Baseline started in February 2008, when 40 villages were randomly selected for various treatments (15 are group lending, 15 from individual lending and 10 control status). A group consisted of 7 to 15 persons and participants in the program could not have a million MNT (\$USD869) or more in assets and must earn less than MNT 200,000 (\$174). Randomization took place at village level and the endline surveys were conducted in 2009 in the same villages, so there is a panel data set (Attanasio et al. 2015).

3.4 Mexico

Comparatamos conducted the intervention program, Credito Majeur; which is the joint-liability program that Comparatamos started to individuals in the outskirts of Nosagles. The program targets women who have businesses or were looking to start one. 51 per cent of borrowers were micro-entrepreneurs and there was no collateral needed to get a loan. The loans were small in nature and increased with the repayment history of the group (Angelucci et al. 2015).

Loan amounts ranged from 1,500 to 27,000 pesos (12 pesos= \$USD1), with an initial range of 1,500 to 6,000 pesos (\$US125-\$US500) on the first borrowing. Groups consisted of 10 to 50

members within the ages of 18 to 60, with the program taking place in the North-Central part of the state of Sonora (Nogales, Caborca, Agua Prieta and surrounding towns).

The study area was divided into 250 geographic clusters (municipalities), half received treatment the other half did not. The treatment entailed participation in the Credito Majeur program, there was a final sample of 238 geographic clusters and 16,560 participants completed the endline survey, there were only 1,823 whom had data for both baseline and endline to form our panel data. The study began in 2010 and ended in 2012(Angelucci et al. 2015).

3.5 Bosnia & Herzegovina

Here this is an individual loan program, the authors do not give the name of the MFI but describe the organization as a large MFI in Bosnia. Loans were offered to people who were considered to be too risky or unreliable to be offered credit on a normal basis. The intervention here was to choose within this sample and offer loans that they had requested on a random basis. Collateral was not required to obtain the loan (Augsburg et al. 2015).

The sample population for this RCT, were individuals who had previously applied for loans but were rejected as they only met 3 of the 6 requirements the large MFI had set in choosing clients to issue loans to, the total sample population included 1,206 individuals. Individuals were informed if they were randomly chosen to be in the treatment or not. The MFI performed this program in all branches they had, the loan distribution began in 2009 and ended in 2010. This is a panel data as the same individuals surveyed in 2009 were also surveyed in 2010.

3.6 Variables and Definition

This section describes the variables that were used during empirical analysis and argues for the inclusion of the variables. For India we represent self-employment (hours worked) by the hours

per week spent on self-employment for endline surveys one and two taken one and two years after the treatment, this helps us to test the prediction of an increase in the share of agents that may enter into self-employment or entrepreneurship. We use the log total wages not from self-employment on the endline surveys to test the prediction two above.

For Ethiopia we utilize the average hours worked per week in the last 12 months in self-employment, this was chosen also to test prediction one above, utilizing the endline survey after one year. Log income from wages was used to test theoretical prediction two. We represent self-employment with the variable *has a business* and wages with log household income from salaried and non-salaried jobs last month for Mexico. Total hours worked on businesses and log amount of income from wage employment, represent self-employment and wages respectively for Bosnia.

To conduct empirics for the prediction three, we utilize income variables: baseline scaled household wage income, household business income from last month and the sum of income gotten from agriculture, private businesses and other sources of wage working income, for Mongolia, Mexico and Bosnia respectively. We had to drop India and Ethiopia from the analysis as the panel data required to link post-treatment outcomes to baseline income is not available.

3.7 Models

$$\text{a) } y_i = \beta_0 + \beta_1 T_i + \varepsilon_i,$$

$$\text{b) } y_i = \beta_0 + \beta_1 T_i + \beta_2 B_Inc_i + \beta_3 I_i + \varepsilon_i$$

Equation (a) describes the empirical design for the research papers analyzed here. These regressions test the predictions one and two from theory presented above. The variable y_i represents the outcome variable with i equaling village, household or individual indicator, T_i represents the treatment indicator and $\varepsilon_{i,t}$ represents the error term. For equation

(b) which tests prediction three, B_Inc_i represents baseline income and I_i represents the interaction between baseline income and treatment, all other variable meanings remain the same for equation (b).

4. Results and Discussion

Table 1 presents the results from equation (a). We first report the effects on self-employment (hours worked), for India (panel a, column 1 and 2). We find that the treatment increased the total number of hours worked per week by 3 hours (panel a, column 1) after the first year and there is a decrease in effect of treatment to 2 hours (panel a, column 2) after the second year, neither are statistically different from zero. We find positive effects also for Mongolia and Bosnia, with an increase of 1 hour in Mongolia and 4 hours in Bosnia (panel a, column 4 and 6), but negative effects in Ethiopia and Mexico with a decrease in hours worked by 2 hours in Ethiopia decrease of probability in having a business by 0.008 in Mexico (panel a, column 2 and 5), we find that all the estimates are statistically insignificant.

We now examine table 1, panel b, where we discuss the effects on wages not made from self-employment. We find that the results are mixed also for the various experimental papers with Ethiopia showing an increase of 19 per cent in wage income, Mexico showing a 2 per cent increase and Bosnia with an effect of 16 per cent (panel b, column 3, 5 and 6) having positive effects, all the reported results here are statistically insignificant for all papers. We get the expected results for India with a 2 per cent and 1.7 per cent decrease in income from wages following treatment and Mongolia also had a 4 per cent decrease in income from wage employment after treatment (panel b, column 1, 2 and 4 respectively). The results here are also

statistically insignificant and there is a reduction in effects of microcredit for India when comparing endline one to endline two.

The results gotten from table 1 are consistent with our prediction of an increase in self-employment for some countries (India, Mongolia and Bosnia) and inconsistent for the others (Ethiopia and Mexico), we get similar results with respect to our prediction that there would be a reduction in wages, we see this to be true in India and Mongolia but not for all other countries examined. However, for randomized programs there is low take up rate of loans, and we only capture the marginal effects of the treatment resulting in a loss of statistical power, so our estimates can be interpreted as “intent-to-treat estimates” (Banerjee et al 2015, pg. 9). Because of the low power of these intent-to –treat estimates, we cannot convincingly refute nor accept the hypothesis that micro-credit increases the level of self-employment or reduces income not from self-employment. However, an alternative explanation for a positive effect on wages could be if people move into self-employment leading to a drop in labor supply all things being equal, this leads to an increase in the wage rate, hence the positive effect.

Table 2 presents the result for equation (b), which tests the prediction that the treatment should benefit the poorest of the poor the most. The number of observations may differ from the values displayed in Table 1 as baseline income is not available for all observations. The coefficient on the interaction term here is our coefficient of interest. We should see that for self-employment there should be a negative relationship, due to the initial wealth constraint and credit market imperfection constraints discussed in the literature review. The poorest of the poor should be more likely to make the move to self-employment as they are more likely to fit the poverty trap hypothesis, so the higher the level of initial income the lower the effect of

the treatment. We get the expected results here with a negative sign for all three papers examined (Mexico, Mongolia and Bosnia).

The result for Mexico shows that at a five per cent level of significance the effect of treatment on hours per week worked in self-employment increases by 1.7 hours (panel a, column 1) if there is a thousand rupees (US\$1) decrease in baseline income. This is the same reasoning level for Mongolia (panel a, column 2) which has a statistically insignificant effect of 0.2 hours of additional increase on self-employment when baseline income has a decrease of $\text{tögrög } 1,150$ (US\$ 1). We find at a one per cent level of significance that for Bosnia there is a larger effect on self-employment, an 11-hour increase, when baseline income reduced by 1.63 BAM (US\$1).

For Panel B, we expect the results to be positive for the interaction term, which is our coefficient of interest. We should see that log income from wage work (wages) has a negative relationship with access to microcredit, showing that people would leave the wage employment to become self-employed, hence reducing total wages from non-self-employment, and that should be more negative with initial income, supporting the hypothesis of initial wealth constraint.

For Mexico (column 1, panel b) our findings show an additional 6 per cent increase (decrease) in wages not from self-employment, when there is a 12pesos (US\$1) increase (decrease) in baseline income, the results here however are statistically insignificant. In Mongolia (column 2, panel b) with a five per cent level of significance, the results show that with an increase of $\text{tögrög } 1,150$ (US\$1) in baseline income there would be a 9 per cent increase of the effect of treatment on income not from self-employment. While at a statistically insignificant level the results for Bosnia show that a decrease of 1.63 BAM (US\$1) of baseline income would lead to

an additional decrease of 0.7 per cent in wages not from self-employment due to treatment. The results for Bosnia may have a higher level of significance because it is an individual-loan program with a better take up rate, when compared to the other papers.

The results of table 2 are consistent with the hypotheses that initial wealth and no access to borrowing traps individuals as in an occupational choice poverty model. Overall, the results from table one and two provide mixed evidence for the existence of an occupational choice poverty trap modelled by Kraay & McKenzie (2014) and others.

5. Conclusion

The aim of this paper was to find out if occupational poverty traps exist, utilizing data from five randomized controlled trial papers. In theory, occupational poverty traps can arise in a scenario of inadequate initial wealth and credit market imperfections. The theoretical papers examined in the literature led us to make three major predictions, that microcredit in the presence of an occupational poverty trap, should, increase the level of self-employment (hours worked), it should also reduce the income gotten from wage working and finally it should affect the poorest of the poor the most. We find the latter to be the case, i.e. we show that the poorest of the poor are the most affected by poverty traps, which is consistent with the theoretical predictions.

We show that access to microcredit may help but does not seem to have a huge effect on people stuck in a poverty trap, as the results are mixed and statistically insignificant for the effects of microcredit on hours worked in self-employment and income from wage working. The results are consistent for the third prediction we do see that the poorest of the poor benefited the most for the program, we see that a decrease in baseline income led to and

increase in the effect of the microcredit treatment on self-employment hours and a decrease in the effect on income from wage working. I suggest a study where the credit amounts are higher than what was allowed in most papers and also a sample population where take up rate is high, so we do not have intent to treat estimates with low statistical power. These findings show that microcredit may be more beneficial than foreign aid, when trying to alleviate individuals from poverty, instead of just providing final goods, individuals can now purchase final goods themselves from higher returns.

The initial wealth constraint hypothesis highlights the importance of addressing income inequality, as occupational poverty trap further increases the level of income inequality as it affects the distribution of income and wealth in an economy, so the notion of the rich getting richer and the poor getting poorer is especially relevant in this study and most especially in today's world. For instance, venture capitalism is at its prime in today's world, with TV shows like Dragon's Den, Shark Tank etc. we have society where the rich get richer and the poor remain poor, unless lent money by the rich. If there is poor redistribution of this income, due to the inability of taxation to complete this task, we have a society like we have today (Milanovic 2006). Distribution of income has a major impact on economic growth indirectly, it affects the levels of various variables that are needed to create an atmosphere for growth in an economy. It affects the "level of savings, investment, risk bearing, fertility, and the consumption of demand and production" (Banerjee & Newman 1993, pg. 275). From this we can see why occupational poverty traps could have major impacts on economic development and can be a factor as to why some countries are poor and others are not when they have the same potential.

Appendix 1

Table 1

Panel A: Self-employment						
	(Banerjee et al. 2015) India <u>Endline 1</u> Total	(Banerjee et al. 2015) India <u>Endline 2</u>	(Tarozzi et al. 2015) Ethiopia	(Attanasio et al. 2015) Mongolia	(Angelucci et al. 2015) Mexico	(Augsburg et al. 2015) Bosnia
	Total hours/week worked in self employment	Total hours/week worked in self employment	Average hours work/week in self-employment	Total household time spent on enterprises	Has a business	Total hours worked on business
Treatment	2.88 (2.37)	1.63 (2.35)	-1.17 (0.58)	0.78 (4.32)	-0.008 (0.009)	3.73 (3.03)
Number of Observations	6762	6142	22499	2109	16560	1206
Number of Clusters	104	104	132	40	238	1206
Panel B: Wages						
	Log total wages not from self-employment	Log total wages not from self-employment	Log income from wages	Log total household income from wage employment	Log household income from salaried and non-salaried job last month	Log amount of income not from self-employment
Treatment	-0.02 (0.04)	-0.017 (0.039)	0.19 (0.16)	-0.04 (0.053)	0.02 (0.03)	0.16 (0.09)

Number of Observations	4027	5167	2002	971	13201	573
Number of Clusters	100	104	131	40	238	573

*= 10% level of significance, **= 5% level of significance and ***= 1% level of significance.

Note: Clustered standard errors in parentheses. Wages for Bosnia are in units, with an exchange of 1.63 BAM to US\$1. For Mexico the wage variable is represented in units as well with an exchange rate of 12 pesos for a US\$1. Also, the Mongolia was in thousands term with 1,150 tögrög equivalence of one US\$1. India paper represented in thousands Rs with a Rs. 1000 = US\$1, and finally Ethiopia has a rate of 2.25 Birr =US\$1

Appendix 2

Table 2

	(Angelucci et al. 2015) Mexico	(Attanasio et al. 2015) Mongolia	(Augsburg et al. 2015) Bosnia
PANEL A: Self-Employment			
Treatment	0.005 (0.03)	2.59 (4.61)	110** (52)
Baseline Income	-0.022*** (0.007)	-0.004** (0.003)	14.5*** (2.93)
Interaction	-0.017** (0.012)	-0.002 (0.002)	-11.15*** (5.45)
Number of Observations	1822	1922	1203
Number of Clusters	33	40	1203
PANEL B: Wages			
Treatment	-0.05 (0.05)	-0.74** (0.29)	-0.06 (0.93)
Baseline Income	0.26*** (0.04)	0.48*** (0.05)	0.45*** (0.05)
Interaction	0.06 (0.06)	0.09** (0.04)	0.007 (0.097)
Number of Observations	1296	749	990
Number of Clusters	33	40	990

*= 10% level of significance, **= 5% level of significance and ***= 1% level of significance.

Note: Clustered standard errors in parentheses. Wages for Bosnia are in units, with an exchange of 1.63 BAM to US\$1. For Mexico the wage variable is represented in units as well with an exchange rate of 12 pesos for a US\$1. Also, the Mongolia was in unit term with 1,150 tögrög equivalence of one US\$1.

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