The Population Association of America 2005 Annual Meeting

Evaluating Poverty Alleviation: Evidence from a Uniquely Assigned Program in Indonesia

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September 2004

Abstract: I investigate the effects of a poverty alleviation program in Indonesia, Inpres Desa Tertinggal (IDT), by exploiting its unique feature: a variation in the intensity of the program. The government provided a fixed amount of financial aid to all the selected villages regardless of the population sizes, causing treated villages to be effectively assigned different levels of per-household grant availability. Results show that IDT increases the fraction of the self-employed as well as the hours of work among self-employed men and decreases the fraction of unpaid workers among women and children. However, this reduction in child labor does not lead to increased school attendance.

1 Introduction

Does public aid to poor areas effectively address poverty? It is a common concern across different societies that certain regions or people fall behind in economic growth. In order to deliver public assistance to the poor, governments attempt to identify the deserving using the information such as an income, wealth, and other observable indicators. In developing countries where such information is difficult to be collected, an alternative scheme, geographical targeting, is seen as an effective tool to reach out the poor (Akerlof (1978), Ravallion and Chao (1989), Bigman and Srinivasan (2002) and Schady (2002)). Using characteristics of a community, this scheme targets public aid to areas where the poor are concentrated. Given relatively small administrative burden, it has been widely adapted into practice.[1]

Though previous studies report that such targeted aid reduces poverty,[2] it is unclear whether these studies establish causal effects of the public transfer on poverty. Since governments are likely to allocate resources to the areas that are likely to benefit the most, the difference between treated and untreated areas may be due to some underlying differences, which may be unobserved by researchers (Rosenzweg and Wolpin (1986)). Utilizing two unique features of Indonesia's poverty alleviation program, *Inpres Desa Tertinggal* (IDT, Presidential Instruction Program for Left-Behind Villages (1994-1997)), I attempt to address the following questions: (1) Does the Indonesian public transfer program improves welfare, measured by expenditure, labor supply, and schooling?; (2) If it does improve welfare, do the effects differ by the village- and household-level characteristics such as the degree of development of a community and human capital of recipient households?

One of the unique features of the IDT program is that the Indonesian government provided the same amount of block grant, 20 million rupiah (approximately $8932),[3] to the targeted villages regardless of the population sizes. This causes per-household availability of the grant to be greater in a village with a smaller number of households, holding fixed within-village distribution rules. Exploiting this variation in the per-household grant availability, or *grant intensity*, I examine whether a village with a greater intensity exhibits larger improvements in welfare. The results indicate that a higher grant intensity increases labor supply in self-employment activities; and it decreases labor supply as an unpaid family worker, especially among women and children. Expenditures and school attendance, however, are not significantly affected.

The rest of this paper is organized as follows: first, I describe previous studies on poverty alleviation programs and give a detailed background of the Indonesian program in sections 2 and 3. Next, in order to predict how

[1] In Asia, in addition to Indonesia that is studied, China and India have conducted programs with geographical targeting as well as many Latin American countries (Park et al.(2002), Bigman and Srinivasan (2002), and Baker and Grosh (1994)).

[2] Jalan and Ravallion (1998) and Park et al. (2002).

[3] This is based on the 1995 average exchange rate of Rp.2239 per dollar (Indonesian Financial Statistics, Bank Indonesia).

households respond to this program, I introduce a two-period Agricultural Household Model. In section 5, I explain how I test these theoretical implications using the econometric frameworks that exploit the variations in grant intensity as well as the change in the selection rule. Following a brief description of data for this empirical analysis, I discuss its major findings. Lastly, I summarize concluding remarks.

2 Related literature

2.1 Poverty Alleviation Programs with Geographic Targeting

The idea that public assistance can be efficiently allocated by targeting the deserving goes back to Akerlof (1978). Schady (2002) found that the distribution of public resources improves the degree of outreach to the poor in Peru when a targeting scheme is used. Bigman and Srinivasan (2002) argued that the efficiency of targeting improves when the targeting is conducted with a small geographic boundary such as a village. While these two studies used simulation methods, Jalan and Ravallion (1998) and Park et al. (2002) examined poverty alleviation programs in China, and found that the poverty levels were reduced after the programs.[4]

2.2 Previous Studies on the Indonesian Poverty Alleviation Program

The IDT program was one of the targeted public transfer programs conducted in Indonesia. Given its clear rules of grant assignment and the availability of nationally representative datasets, many researchers have evaluated the program, but different identification assumptions have yielded different conclusions.

Daimon (2000) argues that the welfare level of the granted villages is still lower than that of non-treated villages. He shows that the aggregated per capita expenditure at the district level is negatively correlated with the fraction of the villages that received the IDT grant, after controlling for district means of the household- and village-level variables. As the author points out, this result is likely to be confounded by the government's endogenous selection of poor villages for the grant. Thus, it is likely to be misleading to interpret this negative correlation as the program effect.

Akita and Szeto (1999) investigates a relationship between the per capita amount of the IDT grant and the inequality in the per capita household expenditure. They show that this inequality is relatively reduced after the program in a province where the per capita grant is higher. This is similar to examining the effect of the grant intensity, except that they estimate the province-level average effect. At the province level, a larger proportion of villages receive the grants if the province initially has a greater inequality in the village score -

[4]Lipton and Ravallion (1995) survey past studies on public assistance programs.

a welfare indicator that the government used for grant assignment (I discuss this score and assignment rule in the following section). If this inequality in the village score is correlated with the inequality in the per capita expenditure, which is probable, then, a province with a high initial inequality receives a greater grant per capita. Therefore, any mean-conversion in the inequality in the per capita expenditure is likely to provide their result.[5] Whether this mean-conversion played a major role or not can be addressed by conducting the investigation at the village-level, which allows a within-province comparison.

The following two studies examine the village-level effects of the IDT grant using different methodologies.[6] One is Molyneaux and Gertler (1999) who estimate the effects of the IDT grant on a number of welfare measures based on the propensity score and difference-in-differences methods. Based on the fact that the government did not perfectly target the poorest villages,[7] they match a treated village and a non-treated village on the propensity score, which depends on the following two criteria of the governmental selection rule: the village score and a field officer's perception of whether the village is poor or not.[8] In addition, they introduce the village-level fixed effect by constructing the village-level panel. Though they obtain a comparable control group after these statistical controls, their sample is too small to detect any program effects. As a result, significant changes in the welfare measures are found sporadically, but they tend not to be compelling.

Alatas (1999) further refines her analytical sample by excluding villages whose grant status is subject to the field officer's perception as the criteria used by these officers are unknown to researchers . She also separately analyzes rural and urban villages, whose selection rules are different. Then, she matches treated and non-treated villages only on the village score. Her results suggest that (1) the per capita household expenditure is increased, and (2) the fractions of spouses and children at work are increased in rural areas, while in urban areas, the fraction of household heads and spouses who are self-employed are increased.

However, it is not likely that villages from different provinces are comparable once the village score is controlled - Alatas (1999)' implicit identification assumption. It was the village score *relative to the provincial thresholds* that affected the probability of being selected, not only the absolute value. Alatas (1999) addresses this issue by introducing the province-level fixed effect, with which, however, little program effects are found perhaps because of a small sample size.[9] Nevertheless, this gap between the results with and without the

[5] Also, the 1993 inequality index is included as one of explanatory variables and as the denominator of the dependent variable, which is likely to cause a spurious negative correlation.

[6] Molyneaux and Gertler (1999) studied the grant effects at the level of enumeration area for the household survey that they used. This is a smaller geographic boundary than a village.

[7] This is because the selection of the treated villages was conducted in each province. Identically scored villages from two distinct provinces could be treated differently if their provinces had very different thresholds. See the next section for details.

[8] In addition, they included the village-level characteristics such as age and educational composition of households, principal sources of household income, the poverty rates in two years prior to the program, and the population.

[9] The changes in the per capita expenditure from 1993 to 1996 are insignificant for rural areas and significantly negative for urban areas. The results for labor supply are not reported.

province-level fixed effect seems to imply possible biases in the across-province comparison, and calls for further evidence that accounts for the provincial heterogeneity, yet retains the ability to robustly test the effectiveness of the Indonesian poverty alleviation program.

In this paper, I provide such evidence by exploiting the unique feature of this program which have not yet been utilized: the treated villages are effectively assigned to different levels of program intensity. In the next section, I will describe this feature in details.

3 Indonesia's Poverty Alleviation Program

3.1 Background

Prior to the currency crisis in 1997/98, Indonesia had been successful in reducing the size of its population living in poverty, from 70 million (60% of the population) in 1970 to 27.2 million (15.1%) in 1990. However, this decrease of the incidence of poverty slowed down in the early 1990s. Given that people in poverty were concentrated in remote areas with little economic opportunities, the government launched the IDT program - a grant transfer program targeting these less developed areas. This program aimed to create new job opportunities and improve the living standards of the poor in a sustainable manner. The government particularly encouraged that the grant be used as a rotating fund to finance productive activities in these villages, and that the fund keeps growing with interest rates (National Development Planning Agency (NDPA), 1994, pp.1-6).

3.2 Implementation Process

The overall implementation of the IDT program involved two distributional stages. The first was a selection of "left-behind" villages, or IDT villages, and the second was a selection of borrowers and the allocation of funds to them. In order to choose relatively poor villages, the government (*Badan Pusat Statistik*, BPS) used an indicator of welfare called a village score - an integer that summarizes the quantity and quality of socio-economic infrastructure in the village. If a village received a low score within the province, then, it was considered "left-behind," or deserving of the IDT grant. The government calculated two threshold values of the score for each province: standard deviation (SD) indicator, and range indicator. The SD indicator is the provincial average minus one provincial standard deviation, and the range indicator is the average minus the provincial range multiplied by 0.6. If a village had a score lower than both of the thresholds, it was selected; if a village had a higher score than both, it was not selected. If a score was between the two thresholds, then,

the selection status of the village depended on the field officer's perception (Graph 1). That is, if the officer thought that the village was poor, then, the village was selected. Once selected, all the IDT villages received the same amount of funding regardless of the population sizes. Therefore, an IDT village with a small number of households received a greater amount of funds per household. This is the variation in grant intensity that I exploit to identify the effects of the IDT program.

In an IDT village, the village head and other community leaders formed groups of eligible households residing in the village, called *Pokmas* (community group).[10] In general, this eligibility depended on the residency and the standard of living of the household; however, details were determined in each village, and are unknown to researchers. Though there were some eligible households who did not take the IDT credit, the participation rate was as high as 87.29%[11]. The government suggested that these groups consist of approximately 30 poor households who lived in the village.[12] Each of these community groups made a group activity proposal, which listed the members of the community group, the amount of money that they planned to borrow, and the kinds of activities that they planned to undertake. These proposals were appraised by the village head, and upon his approval, were submitted to the subdistrict office. Once this subdistrict office approved the proposals, the *pokmas* treasury received the grant directly from the government through a local branch of *Bank Rakyat Indonesia* (BRI), a state-owned commercial bank. The funds were then lent to the *pokmas* members based on the terms defined in each group. Households were expected to repay to the group treasury, and the fund was expected to rotate and grow. [NDPA(1994)][13]

Access to this IDT credit is greater in a high-intensity village. The fraction of people who received the IDT credit as well as the amount of the credit taken by them exhibit positive relationships with the grant intensity (Graph 2 and 3). This suggests that although grant intensity is an ex ante availability of the IDT grant per household, it plausibly predicts the realized access to IDT credit in treated villages. Therefore, if the IDT credit has a positive impact on welfare, a village with a greater intensity is likely to benefit disproportionately.

Most of the borrowers used the IDT credit in agricultural activities. For example, approximately 80% of the

[10]These community leaders include Village Community Resilience Institution (LKMD), which assists the village head and formulates development project proposals for submission to higher levels of government. The members are appointed separately from the village head.[Shar et al. (1994) p.6]

[11]Calculated from the analytical sample used in the first identification strategy (the 1996 SUSENAS), which is explained in the later section.

[12]The government suggested that the community group could be a modification of an existing organization such as *Arisan* (Saving group, a regular social gathering whose members contribute to and take turns at winning an aggregate sum of money), Family Planning Acceptor Group, or a youth group (consists of young men who voluntarily help families who are holding a function, ceremony, party, etc). When there was no such existing organization, the central government suggested that local leaders collect data on poor families, and form the *pokmas* based on an agreement at a village meeting.

[13]These procedures were often supported by facilitators, who were, for example, public officials at sub-district or village levels, doctors, and teachers. They are encouraged to attend *pokmas* meetings, provide special training for its management, help in preparation of an activity proposal, and supervise the activities of the members.

borrowers invested in either crop cultivation, husbandry, or fishery. The rest of the borrowers were engaged in trade, small-scale business, and service (Table 1). The activities for which the grant is used were not strictly specified by the government.[14]

Anecdotal evidence suggests that the effect of the IDT grant varied across villages because some villages could be more effective in publicizing the program and monitoring repayment. Perception of repayment obligation was weak where local governments did not monitor the lending [Kimura (1999)]. Also, the quality of the proposals could be different, depending on entrepreneurship of the *pokmas* members. Even a proposal that was unlikely to be profitable could receive funding if there was little demand for credit in a village because treated villages were required to completely allocate the grant to households within the village [Molyneaux and Gertler (1999)]. To shed light on this issue, I investigate heterogeneity in the grant effects across villages with different levels of administrative capability as well as villages with varying levels of the average educational attainment of the residents.

3.3 A Unique Intergovernmental Transfer

This IDT grant was a larger and more decentralized inter-governmental transfer compared to traditional ones in Indonesia. While the traditional transfer, called a general purpose grant, was Rp. 4.5 million per village in 1992/93 (Shar et al. (1994) pp.57-68.), the IDT grant was Rp. 20 million per village.[15] Also, the IDT program gave villages full discretion as to the distribution and implementation of the grants. This is rare in this highly centralized country, as traditionally, usage of inter-governmental transfers was specified by the central government.[16] In addition, the IDT grant was a shift from a grant for infrastructure development to a fund for credit to poor households, which raised the question of resource allocation optimality (Booth (1993), P. and Aziz (1993)). By adding another piece of evidence on the effective the IDT program in attaining its policy objectives - increasing job opportunities and improving the welfare of the poor - my evaluation of the IDT

[14]However, construction of physical infrastructure was prohibited. This exception was because the government provided the IDT villages with infrastructure as well. Three projects were organized by the World Bank, the government of Indonesia and Japan Bank for International Cooperation (JBIC), which provided transportation and sanitation facilities to different subsets of the treated villages [The World Bank (1995), The World Bank(1996), and JBIC (1999)]. These infrastructure projects are likely to have created employment opportunities in the selected villages, but the results indicate that the impact was, if any, limited, as the fraction of private employee shows no significant change.

[15]Local public services are financed either directly by the central government, or by transfers from central to local governments. Though local governments also use their own revenue, and a lower level of government, such as a village, receives additional transfers from provincial and district governments, they are not dominant sources of revenue. For example, in 1990/91, central transfers made up 60 % and 69 % of total revenues of provincial and district governments, respectively.

[16]Among three kinds of central transfers, routine, specific-purpose, and general purpose grants, the allocation of the first two transfers are directed by the central government (the routine grants are for salaries, and the specific purpose grants are for development activities, such as construction and maintenance of roads and bridges, reforestation, and primary school and health services, respectively). Although, in principle, the general-purpose grant can be spent on anything, a spending plan must be first approved by an upper-level government. Usually, infrastructure development plans receive most of the funds (Shar et al. (1994) pp.7-9).

program is likely to provide a key to addressing the question of efficient public redistribution.

4 Conceptual Framework

In order to conceptualize the pathway through which the IDT credit affects behavior of a household, I use a variant of the agricultural household model that has the following two features. First, households live two periods. In the first period, they receive and allocate credit either to investment or consumption; in the second period, they repay it.[17] This life-cycle feature allows me to consider how the borrowing affects households' decisions of labor supply and consumption. Second, households are engaged in production activities where two types of labor are used as inputs: a manager, who cannot be hired, and a worker, who can be either family or hired labor. With this assumption of non-substitutability for a manager, the recursive property of the agricultural household model breaks down. Therefore, a change in a parameter on the production side, such as an increase in capital stock induced by additionally injected funds for credit, could affect the optimal choices on the consumption side.[18]

I assume that a household has a unitary utility function,[19] and solves the following utility maximization problem;

[17] Using a similar framework, Iqbal(1986) tests whether the interest rate reduces demand for external borrowing.

[18] Other cases where the recursive property breaks down are analyzed by Lopez(1986). He examined two particular cases where a household prefers off-farm work to on-farm work and where off-farm work has a transportation cost.

[19] Though evidence for collective household decision-making is well documented, it is hard to implement an empirical analysis under a model with a bargaining power parameter in this study on the IDT program because the data does not provide any good indicators of the barganing power, or information on who receive and control the credit within the household.

$$max \qquad u = U(X_1, l_1) + \frac{1}{1+\rho} U(X_2, l_2) \tag{1}$$
$$\{X_t, l_t, L_t^M, L_t^W, F_t^M, F_t^W, H_t, K_2, B, I \quad (\text{t=1,2})\}$$

$$s.t. \qquad p_1 X_1 + I \leq [q_1 f(L_1^M, L_1^W, K_1) - w_1(L_1^W - F_1^W)] + B \tag{2}$$

$$p_2 X_2 + B(1+r) \leq [q_2 f(L_2^M, L_2^W, K_2) - w_2(L_2^W - F_2^W)] \tag{3}$$

$$K_2 = (1-\delta)K_1 + I \tag{4}$$

$$L_t^M = F_t^M \qquad (\text{t} = 1,2) \tag{5}$$

$$L_t^W = F_t^W + H_t^W \qquad (\text{t} = 1,2) \tag{6}$$

$$F_t^M + F_t^W + l_t = T \qquad (\text{t} = 1,2) \tag{7}$$

$$r = r(Z, INT) \tag{8}$$

where $X_t (t = 1, 2)$ stands for a composite of purchased goods in periods one and two, and $l_t (t = 1, 2)$ represents the amount of time spent on leisure by household members in these two periods. The budget constraints, eq.s (2) and (3), show how the production and consumption sides interact. In the first period, a household raises its income from the profits accrued in the self-employment activity, $f()$,[20] and from borrowing, B,[21] which is allocated into either investment, I, or consumption, X_1.[22] Then, in the second period, using the income from the self-employment activity, the household repays debt (or receives repayment) at the interest rate, r.

The interest rate, r, is assumed to vary across households, and depends on the household- and village-level characteristics, Z, as well as the intensity of the IDT program, INT (eq.(8)). This assumption of endogenous interest rate is because households have different degrees of access to various credit institutions such as public or commercial banks, informal moneylenders, relatives or neighbors, and public programs like the IDT credit. This degree of access to credit depends on whether a household has collateral, a network of relatives or friends

[20]The fact that self-employment activities can be different across households, or that households can be engaged in multiple self-employment activities are abstracted. This is in line with agricultural household models that use one production function to express households' productive activities that involve many kinds of crops.

[21]This borrowing could take a negative value, in which case a household saves part of the income. In this analysis, in order to focus on the effects of the credit provided in the IDT program, I discuss the case where borrowing takes a positive value. This is not to exclude the possibility of lending or saving. Also, households can borrow from multiple credit institutions, thus, I does not necessarily stand for the IDT credit.

[22]Prices of the composite good and the good produced in self-employment activities are denoted by $p_t (t = 1, 2)$ and $q_t (t = 1, 2)$.

who could lend money, and a good reputation among moneylenders or village officials.[23] It also depends on the village-level factors such as the number and quality of credit institutions.[24] One such village-level factor is the grant intensity, or per-household availability of IDT credit. Holding the household- and village-level factors fixed, the IDT grant increases the amount of funds available to the residents of a selected IDT village. Therefore, the IDT program can be seen as an exogenous factor that lowers the effective interest rate; and the size of this impact varies according to the grant intensity.[25]

The technology employed in the self-employment activity, $f()$, utilizes the two types of labor, i.e., managers, L^M, and workers, L^W, as well as capital, K. This capital depreciates at the rate of δ, and evolves according to eq.(4). Hired labor, which is the difference between the total worker input, L^W, and family worker input, F^W, is compensated at the wage rate of w_t.[26] This separation of managerial and non-managerial work and the assumption of non-substitutability are based on the assumption that the skill and knowledge for self-employment activities are likely to be embodied in the household members who direct the operations; as such, their labor input cannot be replaced by non-household members. Eq.s (5) and (6) express these assumptions on substitutability, and eq. (7) is a constraint on time allocation of all household members.

By substituting the constraints (5) - (8) into the budget constraints, the maximization problem is written as follows;

$$\begin{aligned} L &= U(X_1, T - F_1^M - F_1^W) + \frac{1}{1+\rho} U(X_2, T - F_2^M - F_2^W) \\ &\quad + \lambda\{[q_1 f(F_1^M, F_1^W + H_1, K_1) - w_1 H_1 - p_1 X_1 - I] \\ &\quad + \frac{1}{1 + r(Z, INT)} [q_2 f(F_2^M, F_2^W + H_2, (1-\delta)K_1 + I) - w_2 H_2 - p_2 X_2]\} \end{aligned} \tag{9}$$

Assuming an interior solution, the necessary first order conditions are;[27]

[23] For example, Bank Rakyat Indonesia (BRI), which is a state-owned commercial bank in charge of rural banking, requires collateral for a loan. It also asks a village head about the characteristics of a potential borrower for better screening, and compensates the village head for the information. Other regional banks such as *Badan Kredit Kekamatan* (BKK, Sub-district Credit Banks) in Central Jawa and and *Kredit Usaha Rakyat Kecil* (KURK, Small Rural Credit) in Eastern Jawa do not require collateral, and tend to serve households with lower income levels [Mosley (1996)]. However, there are some households who can not borrow from either of these institutions, and their source of credit is neighbors and friends [MSI/HASFARM (1992)].

[24] It is true that a household can apply for a loan at a credit institution in a neighboring village, however, it often entails higher transaction costs, and a public program such as the IDT credit requires residency. Therefore, for a household without collateral, credit institutions in the village are likely to be their principal source of loans.

[25] In principle, such public injection could crowd out private supply of funds. However, Mosley (1996) suggests that it is not likely the case; he found in his 1993 interview with 30 borrowers and 4 moneylenders that, after the KURK had opened an office in the village in 1989, moneylenders did not change the loan amounts and charged lower interest rates.

[26] If a household is a net seller of labor, then, the difference takes a negative value, and the whole term becomes positive.

[27] I assume that the utility function and the production function considered here are continuous, twice-differentiable with respect to all the respective arguments, and concave. For tractability, I assume weak separability among arguments in the utility function, and that $\frac{\partial^2 f}{\partial K \partial L^W} > 0$, $\frac{\partial^2 f}{\partial K \partial L^M} > 0$, and $\frac{\partial^2 f}{\partial L^M \partial L^W} = 0$.

$$
\begin{aligned}
&U_{X_1} - \lambda p_1 = 0 \\
&U_{X_2} - \lambda \frac{1+\rho}{1+r(Z,INT)} p_2 = 0 \\
&-U_{l_1} + \lambda q_1 f_{L_1^M} = 0 \\
&-U_{l_2} + \lambda \frac{1+\rho}{1+r(Z,INT)} q_2 f_{L_2^M} = 0 \\
&-U_{l_1} + \lambda q_1 f_{L_1^W} = 0 \\
&-U_{l_2} + \lambda \frac{1+\rho}{1+r(Z,INT)} q_2 f_{L_2^W} = 0 \\
&q_t f_{L_t^W} - w_t = 0 \\
&-1 + \frac{1}{1+r(Z,INT)} q_2 f_{K_2} = 0 \\
&p_1 X_1 + I + \frac{1}{1+r(Z,INT)} p_2 X_2 \\
&= q_1 f(F_1^M, F_1^W + H_1, K_1) - w_1 H_1 + \frac{1}{1+r(Z,INT)} [q_2 f(F_2^M, F_2^W + H_2, (1-\delta)K_1 + I) - w_2 H_2] \\
&(t = 1, 2)
\end{aligned}
\tag{10}
$$

The conditions with respect to F_t^M, F_t^W and H_t suggest that, at the optimal point, the following are equalized: marginal utility of leisure, marginal productivity of a manager, marginal productivity of a family worker, and the wage rate for a hired worker. Thus, even though a manager's input is not traded in the market, its optimal level depends on the wage rate. If an exogenous factor in the production side, such as an increase in capital stock, increases marginal productivity of a manager and a worker, the optimal level of a manager's input increases provided that capital and labor are supplementary and that there is no general equilibrium effect. Investment decisions are made so that the marginal productivity of capital stock in the second period equals its user cost, $(1+r)$ where the interest rate is changed by the grant intensity. The condition for the Lagrangian multiplier implies that the lifetime budget constraint holds with equality, and thus, there is no debt or bequest left behind when a household "dies." This system of equations has the following parameters: p_t, w_t, q_t, Z and i, as well as ρ and δ, which suggest the following demand relation;

$$
\begin{aligned}
X_t &= X_t(p_t, w_t, q_t, Z, INT; \rho, \delta) \\
F_t^M &= l_t^M(p_t, w_t, q_t, Z, INT; \rho, \delta) \\
F_t^W &= l_t^W(p_t, w_t, q_t, Z, INT; \rho, \delta) \\
H_t &= L_t^W(p_t, w_t, q_t, Z, INT; \rho, \delta) \\
I_t &= I_t(p_t, w_t, q_t, Z, INT; \rho, \delta)
\end{aligned}
\tag{11}
$$

These reduced-form equations suggest that a change in the grant intensity, INT, affects the optimal choices of consumption, labor supply, and investment. Solving this system of equations for the responses of the optimal decisions with respect to a change in the grant intensity provides the following predictions:

$$
\frac{\partial F_2^M}{\partial (INT)} > 0, \frac{\partial F_2^W}{\partial (INT)} < 0, \frac{\partial X_2}{\partial (INT)} > 0 \tag{12}
$$

An intuitive explanation for these effects is that the lowered interest rate induces investment in the first period, which increases capital stock in the second period. This, in turn, increases marginal productivity of the two types of labor.[28] This induces an increase in a manager's and a worker's inputs. While an increase in a manager's input must come from family labor, a worker's input can be from hired labor. Therefore, to compensate the increased labor supply to managerial work and to respond to a positive income effect due to the increased capital stock, the labor supply to non-managerial work decreases.

5 Identification Strategy

In order to test whether the implications of the model hold, I estimate the effect of grant intensity. I limit my analytical sample to treated villages in order to control for the endogenous grant placement. Then, I estimate the effect of the grant intensity conditional on grant receipt.

[28] I assume that wage rates, $w_t (t = 1, 2)$, are not affected by the program. However, given that some of the treated villages had almost half of the registered households participating in the IDT program, incorporating possible impacts of a general equilibrium effect is an important extension for future work.

5.1 Econometric Framework

Based on the demand relation derived in the previous section, I specify my empirical model as follows;

$$\begin{aligned} Y_{ijpt} &= \alpha_0 + \beta_1 p_{pt} + \beta_2 q_{pt} + \beta_3 w_{pt} + \beta_4 \bar{Y_{pt}} \\ &\quad + \gamma_1 K_{1,ij} + \gamma_2 Z_{ij} + \gamma_3 Z_{jt} + \delta_1 T_t + \delta_2 INT_j * T_t + \mu_j + \epsilon_{ijpt} \end{aligned} \tag{13}$$

where Y_{ijpt} is an outcome variable, and the subscripts i, j, p and t denote the household, village, and province levels, and time, respectively. I partition the factors that affect access to credit into observable and unobservable components at the household- and village-levels, $Z = (Z_{ij}, Z_j, \mu_{ij}, \mu_j)$, where Z's are observed in data and μ's are not. Observable village-level time-invariant factors, Z_j are absorbed in the fixed component of the error term, μ_j. The village-level time-variant factors, Z_{jt}, include prices. The household-level observable factors, Z_{ij}, consist of educational attainment of the household head and housing conditions. Educational attainment is included as a proxy for income-generating ability. Housing conditions are often used by public programs to measure a household's wealth. Some IDT villages are also reported to have used them. unobserved factors, ϵ_{ijpt}, include collateral, a social network, and a reputation among lenders. Given the village-level fixed effect, the village-level average of the household-level time-invariant unobserved characteristics is allowed to be correlated with the grant intensity. The common change in such a village-level average is captured in the time dummy, T, which includes the average effect of grant receipt. A deviation from the mean trend in the village-level average is assumed to be uncorrelated with the grant intensity. To the extent that the households are randomly drawn from the same village in each year, and that migration of a household, not an individual, does not occur very frequently, there is unlikely to be a substantial change in the village-level average of unobserved household characteristics.

This assumption of no correlation between the village-level, time-variant, and unobserved factors and the grant intensity is supported by another unique feature of Indonesia: the village size has been controlled by the government, who splits very large villages into two or more small villages about once every decade. This means that even if population and economic growth occurs simultaneously, their correlation is weakened by the village split. This also holds for the correlations between the population and the outcomes such as employment,

expenditure, and school attendance.

The initial capital stock in the model is assumed to be given when a household is "born." Empirically, this can be seen as the capital stock that is pre-determined before the IDT program. However, since the capital stock is accumulated in the past, and the accumulation process depends on unobserved characteristics such as time preference, this variable is likely to be correlated with the household-level component of the error term. If the capital accumulation solely depends on time-invariant, household-level, and unobservable characteristics, then, the village-level fixed effect is likely to absorb them to the extent that households are randomly drawn from the same village every year.[29] However, this is unlikely to completely control for the unobservables if the capital accumulation also depends on time-variant unobservable characteristics or if a sampling error is large in the repeated cross-section data. The correlation due to the sampling error is likely to be controlled by the inclusion of housing conditions and educational attainment because these variables partially capture the difference between households sampled in different waves.

Another factor included in the error term, ϵ_{ijpt}, is the trend in the local economic condition that may affect the outcome. In order to control for this, I include the district-level average of the outcome, $\bar{Y_{pt}}$, which is instrumented by the average outcome among non-treated villages in order to purge a possible bias due to the reflection problem (Manski(1993)). [30]

5.2 Interpretation of the Estimated Parameter

Under these two specifications, the coefficient of the grant intensity estimates the village-level average effects of receiving an additional 1000 rupiah per household. These effects could vary at the household-level, depending on how IDT credit was extended to different households within a village. However, without knowing how credit recipients were chosen in each village, investigating the household-level effect is beyond the scope of this paper. Therefore, I assume that the average effect of the grant intensity is common across villages, and estimate this average effect, which abstracts from the within-village distribution. This assumption leads to the inclusion of both participants and non-participants in my analytical sample because the households that did not receive credit are still considered as treated as long as they reside in a treated village. Hence, provided that the IDT grant had no effect on non-participants, my results are interpreted as the lower bound of the grant effects among participants in absolute magnitudes.[31]

[29] The household survey that is used is a repeated cross-section, and not a panel. For more details, see the section 5.

[30] This variable varies across districts, which is a smaller geographic boundary than a province. However, I use p to for notational simplicity.

[31] Also, possible general equilibrium effects through the labor and credit markets may influence those who do not participate in the program, to the extent that a treated village forms closed markets. In future work, I plan to test whether the effect of the

6 Data

6.1 Data Sources

6.1.1 The SUSENAS: Household Survey

For this empirical investigation, Indonesia provides excellent datasets. The National Socio Economic Survey (SUSENAS), which is a nationally representative repeated cross-section dataset, contains information on schooling, labor supply, expenditure, as well as other household characteristics. The sample size of approximately 202,000 households provides a firm basis for the present analysis.[32] The 1993 and 1994 SUSENAS provide information on a pre-program period, enabling me to test spurious program effects[33]; in addition, the 1995 and 1996 SUSENAS contain information on a post transfer period, which allows me to examine the evolution of the effects of the IDT grant.[34]

The sample households are drawn in two stages. First, a sample is selected at the level of an enumeration area (EA), that is, a part of a village that contains approximately 200-300 households or buildings not used for living. Approximately 36,000 EAs are selected according to the probability that is proportional to the number of households[35]. Then, 16 households are randomly chosen from each of the selected EAs[36]. One village can have more than one EA.

6.1.2 The PODES

These SUSENAS datasets are combined with a census dataset on village characteristics, *Potency Desa* (PODES, Village Potential Statistics). The PODES provides information on population, economic and social infrastructure, and local government's human capital and development. This facilitates the investigation of heterogeneity in the grant effects. The PODES is enumerated three times in a decade. The datasets collected in 1993 and 1996 provide information before and after the first transfer of the IDT grant.

grant intensity is smaller in a village with better access to outside the village (measured by transportation and telecommunication infrastructure). If this holds, it may suggest that spill-over effects are smaller in a village with open labor and/or credit market.

[32] Surbakti (1995).

[33] Prior to 1993, the SUSENAS had a substantially smaller sample size of 65,000 households; thus, they are not used.

[34] The SUSENAS for years 1997 and later are not used because of the following reasons: by 1997, the dataset could reflect the effect of the third transfer in the fiscal year of 1996/97; however, the government's allocation rule for this third transfer is not very well known. The 1998 SUSENAS is likely to additionally include the effect of the currency crisis.

[35] For example, to enumerate the 1996 SUSENAS, 36,000 EAs are sampled from the total of 180,000 EAs of the Main Outline of the Population Census 1990.

[36] An EA is divided with distinct boundaries into several segment groups that has approximately 70 households. One of these segment groups is selected, from which 16 sample households are randomly drawn.

6.1.3 An IDT Administrative Dataset

Combined with these two datasets is the census administrative data on the IDT program.[37] This dataset provides the village score and grant status, which I exploit to construct my analytical sample.

Graph 4 summarizes the timing of the enumeration of the SUSENAS and the PODES, together with the timing of grant payment. The first disbursement was between April of 1994 and March of 1995 as the fiscal year in Indonesia is from April to March. Since the interviews for the SUSENAS usually take place between December and February, the 1995 and 1996 SUSENAS reflect the effects of having the IDT grant for at most half a year and one and a half years, respectively. This allows me to test whether the grant effect took place immediately or gradually. In principle, it is possible that households already borrowed or even repayed the IDT grant by January of 1995 if the village finished proposal submission and credit distribution very quickly, however, anecdotal evidence suggests that some villages took time to form the *pokmas*, and thus, it is unlikely that all the villages had distributed the IDT grants by the end of the year 1994. Therefore, I expect to see full effects of the IDT grant in 1996, and not much in 1995.

6.2 Measurement

In order to measure the program effect on a manager's and a worker's inputs, I use the primary employment status of the week prior to the enumeration. This has two categories for the self-employed: with and without an assistant. I will examine both the aggregated and disaggregated fractions of the self-employed. For a worker, family labor is classified to two types: a paid private worker and an unpaid family worker.[38] The information on hired labor is not available in the SUSENAS.

Consumption is measured by per capita household expenditure in the month prior to the enumeration. Price differences across time and across districts are adjusted using indexes for general commodities. I examine food and non-food expenditures as well as the total expenditure. School attendance is captured by a dummy variable for regularly attending a school. This is investigated separately for different subgroups defined by age and sex.

6.3 Summary Statistics

The analytical sample for the first strategy shows that self-employment is prevailed among male adults aged 31 and above, absorbing more than 70% of them (Table 6.1). It also suggests that more men become self-employed

[37] I am thankful to Mr. John Molyneaux for kindly providing this dataset.

[38] By definition, the family worker is a household member who works for other household members, neighbors or relatives who are not necessarily the household member. However, I assume that the last two cases are not very common.

as they become older. Among men aged 16-20 and 21-30, 15% and 53% of them are self-employed, respectively. However, self-employment is not as common as this among women; at most a quarter of them is self-employed. Instead, many of them work as unpaid family workers. Based on these differences in employment status by age and sex, I will separately analyze the subgroups defined by these two attributes. In addition, I will control for the demographic characteristics such as the household size and the composition of household members in the regression equation. Among those who are at work, the mean hours of work are similar across age groups except for children who are under 16 years old (Table 6.3). However, the mean hours are different across employment status. For example, among men, private workers spend a larger amount of time than the self-employed, and unpaid family workers spend the least. Self-employed and privately employed women spend the same amount of time, and unpaid family workers spend fewer hours.

The mean level of per capita monthly household expenditure is 35,574 rupiah in terms of 1995 Jakarta price. This is about $15.89 in 1995 U.S. dollar term. On average, more than 71% of this total expenditure is spent on food (Table 6.4). Table 6.5 indicates the fraction of children regularly attending school. Among children aged for primary school (7-12), the fraction is about 87% for both boys and girls. It declines at the secondary school level, with 56% and 22% of those aged between 13 and 15 as well as 16 and 18 attending school. Consistent with these declines, Table 6.6 indicates that more children are at work as they become older. Even among as young children as those aged between 10 and 12, about a third of them spend most of their time working. A large proportion of these young labor is unpaid family workers. If some of them are relieved from helping household members as the model predictes, their schooling, which is an alternative activity for them, may increase. I will examine this outcome as well as the other outcomes motivated by the model.

7 Results

7.1 Labor Supply

The first column of the Table 7.1 shows the result of estimating eq.(13) without including any variables other than the grant intensity and the time dummy. The positive coefficient of the grant intensity suggests that the larger the grant intensity is, the greater the change from 1994 to 1996 (post-program period) in the fraction of self-employed men (21-30 year-olds). The coefficient of the time dummy includes both the program effect and a time trend in the outcome. Though I control for the district-level average trend, it is not clear how much of the estimated coefficient implies a causal effect of the program. Therefore, I will concentrate on the effect of

grant intensity in my analysis.[39]

The coefficient of the grant intensity shows no change in its magnitude or significance after the inclusion of price variables (column 2), but both of them become larger after further adding demographic (columns 3, 4 and 6) and investment-related (columns 5 and 6) variables. This is perhaps due to the following: there is likely to be a negative bias in the coefficient in columns 1 and 2 if the probability of being self-employed is positively correlated with an omitted variable such as the demographic characteristics, and the grant intensity is negatively correlated with such characteristics. For example, a man is more likely to be self-employed if he is older. A low-intensity village, i.e., a more populated village, tends to have a positively skewed distribution of age. This means that, given the average age in the village, a low-intensity village is more likely to have a higher proportion of young men who are less likely to be self-employed. The negative bias caused by such correlations is likely to be purged if the demographic characteristics are controlled. As shown in columns 3, 4, and 6, age has a positive effect on the probability of being self-employed. Also, a man is less likely to be self-employed if he has a larger family or if there are other male household members who could be self-employed instead of himself. These demographic variables appear to control for the correlations between the grant intensity and otherwise unobserved household attributes.

Similarly, the investment-related variables are likely to control for possible correlations between the grant intensity and unobserved wealth and ability. There is likely to be a negative bias if a wealthier and more able man is less likely to be self-employed and if the distribution of such characteristics is positively skewed in a high-intensity village. The coefficients of the investment-related variables indicate that a man is less likely to be self-employed if he has better housing conditions and higher educational attainment. To the extent that these variables are positively correlated with unobserved wealth and ability, the supposed negative bias is likely to be purged.

While this result shows that in a post-program period the fraction of the self-employed increased in a more intensely treated village, the result for a pre-program period (1993-94) show no such effect (Table7.2). Also, the regression result for the change from 1994 to 1995 indicates an insignificant increase in the fraction of the self-employed (not shown). This seems to suggest that the increase found in Table 7.1 is due to the IDT program, and not a mere trend in high-intensity villages.

The results for other age groups suggest that the increase in the self-employed is concentrated among

[39]Even if I assume that the coefficient is consistently estimated, the value does not provide the average program effect because the grant intensity is included in the regression. For example, with the average intensity of 4, the average program effect is $-6.067 + 1.28 * 4 = -0.947$. However, in four out of six specifications, the coefficient is not accurately estimated to reject the null hypothesis.

relatively young adults aged between 21 and 40 (Table 7.3a). Women show a more consistent pattern, increasing the fraction of the self-employed for all age groups, though with a smaller magnitude (Table 7.3b). When combined, both women aged between 21 and 40 as well as 41 and 70 indicate significant increases. The same regression analysis is conducted separately for the self-employed with and without assistants. The results for men and women suggest that all the increases are due to the increase in the self-employed with assistants (Table 7.4a, b). This implies that these increases in the self-employed accompany new demand for labor, indirectly supporting the prediction that hired labor will increase.

These increases indicate a positive effect on the intensive margin. Alternatively, the IDT credit could induce the already self-employed households to spend a longer time on their production activities. The result of the analysis on this extensive margin shows that self-employed men with assistants aged between 21 and 40 increased their hours of work (Table 7.5a), but self-employed women exhibited no such increase (Table 7.5b).

Another prediction of the model is that the family labor will decrease. Table 7.6a and b show that the fraction of female unpaid family workers declines in the post-program period. This decrease is seen for all age groups.[40] On contrary, there is no such a decrease in the male fraction, except for boys aged between 10 and 15. This is likely to reflect the fact that male adults rarely serve as unpaid family workers in Indonesia with the exception of children, who primarily work as unpaid family workers regardless of sex. The hours of work among these unpaid family workers or paid workers, however, do not show any significant changes (not shown). These results indicate that the decrease in labor supply to non-managerial work operates through the intensive margin, while the increase in labor supply into managerial work does through the extensive margin.

7.1.1 Consumption

The other theoretical prediction is an increase in consumption. The result for the post-program period shows that the per-capita household expenditure increased from 1994 to 1996 in high-intensity villages (Table 7.7). This is mainly due to the increase in a non-food expenditure. However, the result for the pre-program period suggests the same effect. The difference between these two periods is that the average level indicated by the coefficient of the time dummy also increased in the post-program period, but not in the pre-program period. However, as long as I evaluate the program from the estimated grant intensity effect, there does not seem to be a significant increase in the per capita expenditure induced by the IDT program.

[40] Except that women aged between 21 and 30 have a similar negative effect from 1993 to 1994, making it less clear whether the decrease from 1994 to 1996 was due to the program, and that women aged between 16 and 20 show marginal significance.

7.1.2 School Attendance

The result that child labor is decreased after the IDT program motivates the investigation of whether their alternative activity, schooling, is increased. Table 7.8 shows, however, that the fraction of children who regularly attend school is not changed significantly. This is possibly due to inflexibility of the measure of school attendance. For example, the hours that are devoted to schooling and homework, may be able to detect a slight change in children's time allocation from work to school work.

7.1.3 Interpretation of the Estimates

Using the result based on the preferred specification (column 6), the effect of the grant intensity can be evaluated at the median intensity. Taking partial derivative of the outcome variable with respect to the grant intensity results in the following;

$$\begin{aligned} \frac{\partial Y}{\partial INT}|_{T=1} &= \frac{\delta_2}{I} \\ \frac{\partial Y}{\partial INT}|_{T=0} &= 0 \end{aligned} \tag{14}$$

Therefore, the effect of grant intensity, τ_1, on the change in the fraction of self-employed men aged 21-30 (Table 7.3a) is estimated as follows;

$$\hat{\tau_1} = 3.513/4 = 0.878 \tag{15}$$

This indicates that the fraction of self-employed men is increased by 0.493% on average due to an additional 1000 rupiah per household in the treated villages. As discussed, this is the village-level estimate of the effect that average over participants and non-participants. Similar calculations indicate the the fraction of self-employed women (31-40 year-olds) increased by 0.671%, the hours of work among self-employed men (21-30 year-olds) increased by 20 minutes per week, and the fraction of boys (10-15 year-olds) at work by -0.810%.

8 Conclusion

I have investigated the effects of IDT program - a targeted public transfer program in Indonesia - by exploiting its two unique features: a variation in the grant intensity and a change in the government's placement rule. The government provided a fixed amount of financial aid to all the selected villages regardless of the population sizes. This caused treated villages to be effectively assigned to different levels of per-household grant availability. Also, in the second year of the program, the government changed the placement rule, which revealed that some of deserving villages were not treated in the first year due to the imperfect targeting.

Exploiting these unique features, I have tested the predictions of agricultural household model that takes into account the microfinance scheme of the IDT program. The data have supported the two main predictions that households increase their labor supply to self-employment activities and decrease labor supply as unpaid family workers. In villages receiving high intensities, the fraction of the self-employed as well as the hours of work among the self-employed are increased, and the fraction of unpaid workers are decreased. The increase among the self-employed was concentrated among young adults both men and women, but the increase in the hours of work was found only among young men. The decrease in the fraction of unpaid family workers was found among women and children. These results are consistent with the model assuming that the IDT credit, used to expand or start up small-scale business, increased labor supply in self-employment activities. The increased labor supply from family labor to managerial work was compensated by the decrease in labor supply as unpaid family workers.

These findings are not likely to be subject to the bias due to the government's endogenous program placement because I exploit the variation in grant intensity, and not in grant receipt, in order to estimate the program effects. In addition, I check the across-time change both pre- and post- program periods and find the contrast of no effect in the pre-program period and a significant improvement in the post-program period. Therefore, the results are likely to serve as evidence of positive impacts of the IDT program on labor supply. In turn, this is likely to contribute to furthering our understanding of the effects of poverty alleviation programs.

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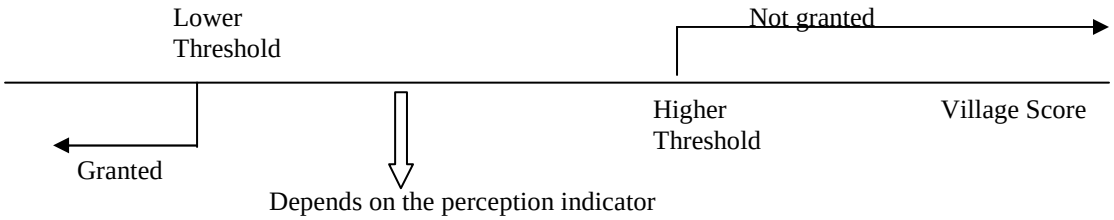
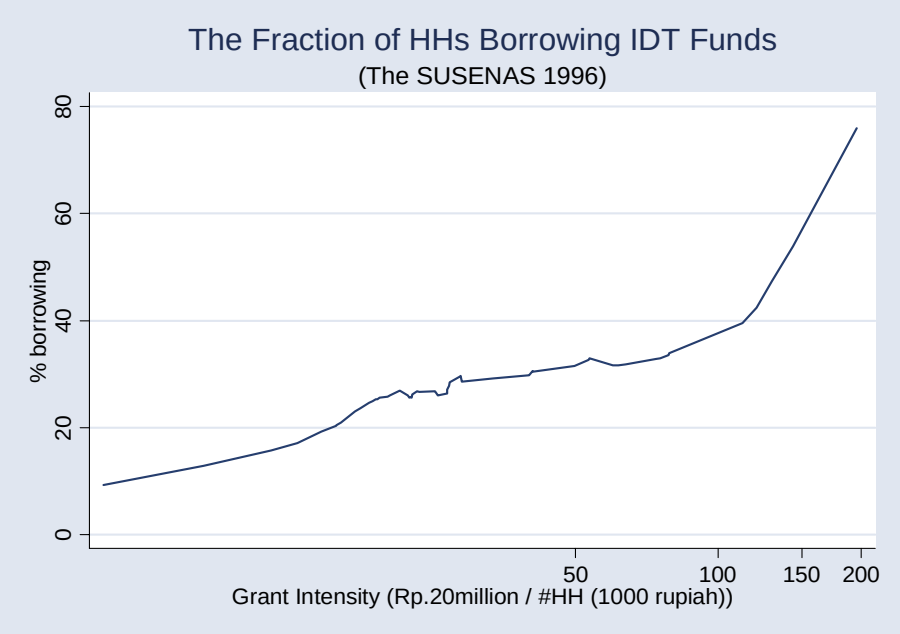
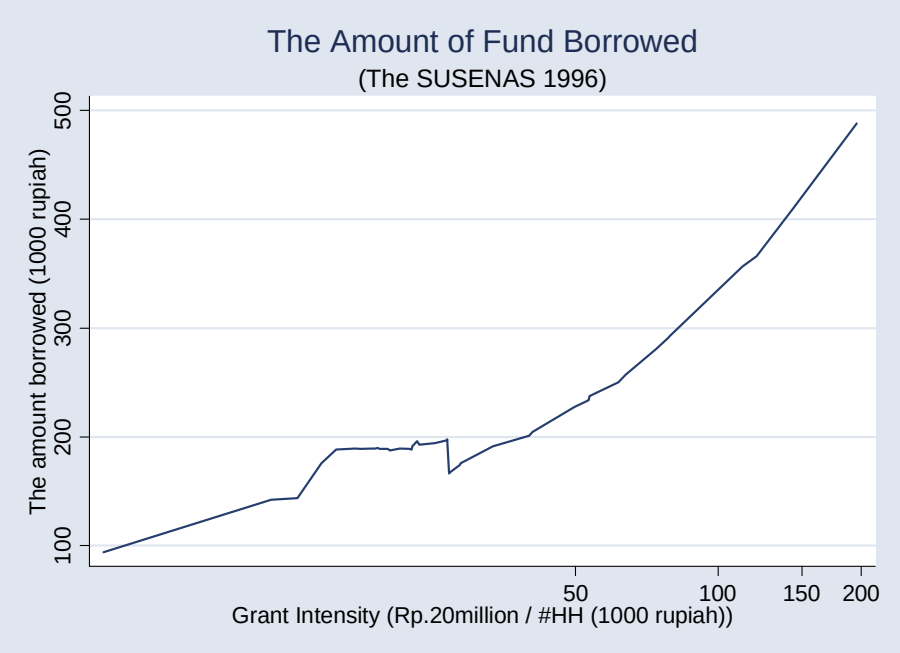
Graph 1 Grant Assignment



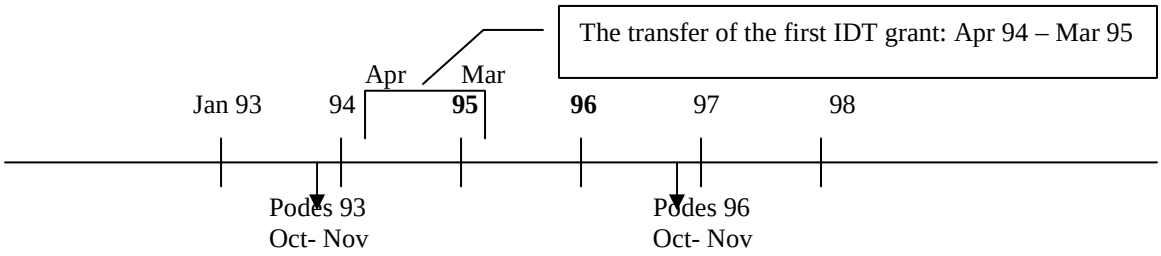
Graph 2 Grant Intensity and the Fraction of Households Borrowing from the IDT Fund



Graph 3 Grant Intensity and the Amount of the IDT Fund Borrowed



Graph 4 Timing of data enumeration and program implementation



Note: The short vertical lines indicate the beginnings of years, which are also the time when the SUSENAS, the annual household surveys are collected. The arrows show when the PODES, the village-level census are collected. As the 1993 grant was provided to the community groups in the granted villages during 1994 fiscal year, which is from April of 1994 to March of 1995, the 1995 and 1996 SUSENAS are likely to provide information on outcomes after the grant was partly and fully utilized, respectively.

Table 6.1 Labor Force Participation and Employment Status by Age and Sex (1994)

Men

	Obs.	Working	Self-Employed		Employee	
Age			W/out help	With help	Paid	Unpaid
10-15	10286	25.01	1.22	1.41	1.50	20.77
		43.31	11.00	11.79	12.14	40.57
16-20	5805	73.28	7.41	8.60	10.58	45.93
		44.25	26.19	28.03	30.76	49.84
21-30	9624	92.96	20.05	33.15	14.40	21.37
		25.59	40.04	47.08	35.11	41.00
31-40	9115	97.21	22.94	53.42	10.84	3.81
		16.46	42.05	49.89	31.09	19.14
41-50	6182	96.88	18.60	61.89	8.20	2.94
		17.39	38.92	48.57	27.44	16.91
51-70	6419	87.77	15.61	61.21	5.67	2.84
		32.76	36.30	48.73	23.13	16.60

Women

	Obs.	Not Work	Self-Employed		Worker	
Age			W/out help	With help	Paid	Unpaid
10-15	9152	18.79	0.79	1.18	1.25	15.54
		39.07	8.84	10.80	11.09	36.23
16-20	6004	50.10	3.53	4.25	5.48	36.54
		50.00	18.46	20.17	22.76	48.16
21-30	11209	57.16	5.89	7.66	4.25	37.76
		49.49	23.54	26.60	20.17	48.48
31-40	9349	65.58	7.19	13.11	4.42	39.48
		47.51	25.83	33.76	20.55	48.88
41-50	5912	68.47	7.97	16.39	4.65	38.53
		46.47	27.08	37.02	21.06	48.67
51-70	6343	56.53	9.63	14.49	4.68	27.46
		49.58	29.51	35.20	21.13	44.64

Table 6.2 Hours of Work by Age and Sex (1994)

	Men			Women		
Age	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
10-15	2573	24.48	13.65	1720	23.31	13.92
16-20	4254	34.05	14.22	3008	28.98	14.01
21-30	8946	38.69	13.15	6407	28.89	13.39
31-40	8861	39.52	12.79	6131	29.61	13.72
41-50	5989	38.66	12.62	4048	30.02	13.52
51-70	5634	35.82	13.13	3586	27.85	13.24

Table 6.3 Hours of Work by Employment Status and Grant Status: 20-50 years old (1994)

	Men			Women		
Status	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Self	5171	38.91	13.67	1803	32.59	15.89
Selfa	11885	38.63	12.07	3054	32.78	15.20
Pri	2881	44.88	13.71	1164	33.71	14.94
Fam	2586	34.46	12.32	10201	27.22	11.98

Table 6.4 Per Capita Monthly Household Expenditures (1994)

Expenditure on;	Mean	SD
Total	35,574	22,915
Food	25,375	15,277
Nonfood	10,199	11,040
# households	29,603	
# villages	1798	

Table 6.5 The Fraction of Children Regularly Attending School (1994)

	Men				Women		
Age	Obs.	Mean	SD	**Age**	Obs.	Mean	SD
7-12	11528	87.31	33.29	7-12	10458	87.25	33.35
13-15	4639	58.61	49.26	13-15	4019	55.74	49.68
16-18	3722	24.23	42.86	16-18	3537	20.21	40.17
19-25	6785	4.6	20.95	19-25	7911	2.55	15.78

Table 6.6 The Fraction of Child Labor (1994)

Men

		% Working		% unpaid family worker	
Age	Obs.	Mean	SD	Mean	SD
10-12	5647	13.94	34.64	12.61	33.20
13-15	4639	38.50	48.66	30.70	46.13
16-18	3722	68.54	46.44	45.67	49.82
19-25	6785	87.30	33.30	35.95	47.99

Women

		% Working		% unpaid family worker	
Age	Obs.	Mean	SD	Mean	SD
10-12	5133	9.76	29.68	8.77	28.28
13-15	4019	30.33	45.97	24.19	42.83
16-18	3537	48.54	49.99	36.08	48.03
19-25	7911	53.90	49.85	36.73	48.21

Table 7.1 The Effect of Grant Intensity on the Fraction of the Self-employed : Men (21-30)
Post-program period

Poicy variables	(1)	(2)	(3)	(4)	(5)	(6)
Log {Grant Intensity}	1.626	1.743	3.045	3.008	2.306	3.513
	[1.323]	[1.326]	[1.159]**	[1.171]*	[1.316]	[1.165]**
1{Post-program}	-7.156	47.817	-12.579	-12.368	42.58	19.925
	[5.531]	[22.904]*	[4.843]**	[4.869]*	[23.617]	[20.917]
Prices						
Price of food		-2.619			-2.354	-1.264
		[1.170]*			[1.197]*	[1.060]
Price of housing		2.568			2.247	0.943
		[1.410]			[1.422]	[1.259]
Trend						
District-level average				-0.011	-0.148	0.05
				[0.162]	[0.180]	[0.160]
Demographic characteristics						
Age of HH head			-12.574	-13.246		-11.725
			[4.293]**	[4.314]**		[4.275]**
Age^2			0.29	0.304		0.272
			[0.084]**	[0.085]**		[0.084]**
Log of HH size			-28.087	-28.07		-26.58
			[1.669]**	[1.677]**		[1.686]**
% HH member aged 0-9			58.723	58.978		55.113
			[8.590]**	[8.613]**		[8.521]**
% HH member aged 10-15			28.759	28.191		27.606
			[9.844]**	[9.880]**		[9.763]**
% HH member aged 16-29			39.533	39.749		39.849
(female)			[9.034]**	[9.058]**		[8.951]**
% HH member aged 16-29			-21.492	-21.062		-17.659
(male)			[9.096]*	[9.127]*		[9.023]
% HH member aged 30-65			-4.006	-3.76		-6.453
(female)			[9.952]	[9.985]		[9.867]
% HH member aged 30-65			-58.56	-58.982		-57.253
(male)			[9.259]**	[9.288]**		[9.184]**
Investment-related characteristics						
Educational attainment of HH head						
Attended but no degree					-2.629	-1.017
					[2.208]	[1.959]
Primary degree					-8.37	-4.692
					[2.195]**	[1.961]*
Secondary degree					-24.033	-16.047
					[2.259]**	[2.034]**
log of floor area					-0.098	0.009
					[0.018]**	[0.016]
1{Wall type is brick}					-7.967	-6.538
					[2.288]**	[2.029]**
1{Floor type if marble or tile}					4.065	4.26
					[3.744]	[3.314]
1{Roof is not made of shingle}					-3.829	-3.587
					[2.009]	[1.784]*
1{Source of light is electoricity}					-1.531	0.642
					[2.424]	[2.148]
1{Have a private toilet facility}					-1.7	-0.903
					[1.867]	[1.654]

Constant	51.855	-2.335	211.928	220.725	39.795	229.464
	[0.865]**	[89.401]	[54.429]**	[55.307]**	[88.065]	[96.003]*
Observations	5860	5860	5860	5820	5820	5820
Villages	503	503	503	503	503	503
F-stat	0.85	1.95	150.49	1.94	1.93	1.94

Standard errors in brackets
* significant at 5%; ** significant at 1%

Table 7.2 The Effect of Grant Intensity on the Fraction of the Self-employed : Men (21-30)
Pre-program period

	(1)	(2)	(3)	(4)	(5)	(6)
Log {Grant Intensity}	1.015	0.855	0.461	0.36	0.557	0.085
	[0.987]	[0.994]	[0.864]	[0.894]	[0.998]	[0.883]
1{Post-program}	-2.632	-2.782	0.063	-0.09	-4.536	-9.412
	[4.320]	[15.978]	[3.784]	[3.800]	[15.772]	[13.950]
Prices		Yes			Yes	Yes
Demographic Ch.			Yes	Yes		Yes
District-level trend				Yes	Yes	Yes
Investment-related Ch.					Yes	Yes
Observations	23858	23858	23858	23750	23750	23750
Villages	829	829	829	827	827	827
F-stat	10.73	6.39	483.4	4.5	4.24	4.03

Table 7.3a The Effect of Grant Intensity on the Fraction of the Self-employed by Age: Men

Pre-program period (1993-94)

	Age Group					
	21-30	31-40	41-50	51-70	21-40	31-50
Log {Grant Intensity}	0.085	-2.199	-2.93	-0.96	-0.818	-2.42
	[0.883]	[0.845]**	[1.027]**	[1.126]	[0.607]	[0.638]**
1{Post-program}	-9.412	25.147	18.513	0.634	10.415	21.895
	[13.950]	[12.566]*	[15.524]	[16.898]	[9.219]	[9.458]*
Observations	9266	8514	5594	5762	17934	14386
Villages	807	810	769	727	827	826
F-stat	2.05	2.34	1.62	1.41	3.26	3.11

Post-program period (1994-96)

	Age Group					
	21-30	31-40	41-50	51-70	21-40	31-50
Log {Grant Intensity}	3.513	2.243	0.711	-0.367	2.731	1.226
	[1.165]**	[1.087]*	[1.309]	[1.553]	[0.789]**	[0.810]
1{Post-program}	19.925	-25.016	-14.91	-24.672	-8.867	-22.39
	[20.917]	[18.115]	[20.956]	[24.005]	[13.847]	[13.347]
Observations	5820	5527	3767	3774	11414	9420
Villages	503	506	489	460	515	515
F-stat	1.94	2.12	1.72	1.4	2.93	2.79

Table 7.3b The Effect of Grant Intensity on the Fraction of the Self-employed by Age: Womeen

Pre-program period (1993-94)

	Age Group					
	21-30	31-40	41-50	51-70	21-40	31-50
Log {Grant Intensity}	-0.287	-0.605	1.661	-1.711	-0.414	0.216
	[0.643]	[0.821]	[1.087]	[1.142]	[0.507]	[0.641]
1{Post-program}	-9.423	-12.866	-17.612	-33.964	-10.078	-15.797
	[10.267]	[11.903]	[17.268]	[15.953]*	[7.683]	[9.496]
Observations	10774	8618	5470	5590	19479	14361
Villages	823	815	760	691	827	827
F-stat	3.21	2.93	2.02	1.66	4.97	3.73

Post-program period (1994-96)

	Age Group					
	21-30	31-40	41-50	51-70	21-40	31-50
Log {Grant Intensity}	1.229	2.683	2.255	2.681	2.222	2.378
	[0.855]	[1.005]**	[1.395]	[1.502]	[0.643]**	[0.793]**
1{Post-program}	21.847	26.503	25.505	24.673	22.277	27.392
	[15.058]	[15.946]	[23.895]	[22.116]	[11.124]*	[12.866]*
Observations	6758	5778	3513	3694	12564	9447
Villages	511	512	468	446	515	515
F-stat	3.13	2.58	2.11	1.86	4.54	3.56

Table 7.4a The Effect of Grant Intensity on the Fraction the Self-employed by Business Size: Men

Pre-program period (1993-94)

	Age Group							
	21-30		31-40		41-50		51-70	
With Assistants	No	Yes	No	Yes	No	Yes	No	Yes
Log {Grant Intensity}	0.65	-0.642	0.902	-3.582	2.149	-4.734	0.781	-1.54
	[0.806]	[0.884]	[0.893]	[0.975]**	[1.007]*	[1.226]**	[0.933]	[1.250]
1{Post-program}	-5.42	-3.448	-18.146	50.918	7.267	8.544	-10.284	9.429
	[12.551]	[14.071]	[13.097]	[15.275]**	[14.864]	[18.507]	[13.944]	[18.594]
Observations	9266	9266	8514	8514	5594	5594	5762	5762
Villages	807	807	810	810	769	769	727	727
F-stat	2.57	2.47	3.04	3.1	2.11	2.15	2.17	1.91

Post-program period (1994-96)

	Age Group							
	21-30		31-40		41-50		51-70	
With Assistants	No	Yes	No	Yes	No	Yes	No	Yes
Log {Grant Intensity}	0.633	2.94	-1.411	3.697	1.268	-0.476	2.581	-2.969
	[1.006]	[1.159]*	[1.081]	[1.225]**	[1.223]	[1.542]	[1.238]*	[1.672]
1{Post-program}	3.765	17.172	-14.561	-12.021	-12.187	-3.987	-83.895	59.067
	[17.466]	[20.385]	[17.709]	[20.293]	[19.566]	[24.591]	[19.567]**	[26.160]*
Observations	5820	5820	5527	5527	3767	3767	3774	3774
Villages	503	503	506	506	489	489	460	460
F-stat	2.58	2.18	3.1	3.11	2.22	2.08	2.24	1.97

Table 7.4b The Effect of Grant Intensity on the Hours of Work among the Self-employed by Age: Women

Pre-program period (1993-94)

	Age Group							
	21-30		31-40		41-50		51-70	
With Assistants	No	Yes	No	Yes	No	Yes	No	Yes
Log {Grant Intensity}	-0.54	0.062	-0.573	-0.683	1.172	0.669	0.092	-1.927
	[0.458]	[0.505]	[0.584]	[0.722]	[0.721]	[1.000]	[0.800]	[0.998]
1{Post-program}	2.267	-7.65	-12.25	7.123	13.587	-32.997	-20.295	-11.948
	[7.280]	[8.159]	[8.327]	[10.999]	[11.245]	[15.869]*	[11.218]	[13.839]
Observations	10774	10774	8618	8618	5470	5470	5590	5590
Villages	823	823	815	815	760	760	691	691
F-stat	3.01	2.8	2.61	2.26	1.58	1.8	1.42	1.67

Post-program period (1994-96)

	Age Group							
	21-30		31-40		41-50		51-70	
With Assistants	No	Yes	No	Yes	No	Yes	No	Yes
Log {Grant Intensity}	0.611	0.575	0.927	2.055	0.207	1.655	1.457	1.236
	[0.620]	[0.667]	[0.709]	[0.860]*	[0.934]	[1.245]	[1.067]	[1.289]
1{Post-program}	-8.359	28.989	-7.839	32.912	3.981	23.433	-6.652	31.255
	[10.549]	[11.544]*	[10.972]	[13.518]*	[16.017]	[21.277]	[15.867]	[19.114]
Observations	6758	6758	5778	5778	3513	3513	3694	3694
Villages	511	511	512	512	468	468	446	446
F-stat	2.5	2.58	1.89	2.35	1.97	1.74	1.65	1.54

Table 7.5a The Effect of Grant Intensity on Hours of Work the Self-employed by Business Size: Men

Pre-program period (1993-94)

	Age Group							
	21-30		31-40		41-50		51-70	
With Assistants	No	Yes	No	Yes	No	Yes	No	Yes
Log {Grant Intensity}	-0.495	-0.826	0.721	-0.19	-0.391	-0.473	0.035	-0.163
	[0.747]	[0.447]	[0.602]	[0.314]	[0.908]	[0.369]	[1.110]	[0.420]
1{Post-program}	6.14	8.047	6.03	4.18	-10.536	3.249	0.284	-1.252
	[8.902]	[7.013]	[9.268]	[4.643]	[11.772]	[6.150]	[16.245]	[6.163]
Observations	1168	2413	1347	4057	522	3170	481	3158
Villages	257	462	283	595	159	578	138	552
F-stat	2.31	3.36	2.63	4.41	2.25	3.17	1.7	3.27

Post-program period (1994-96)

	Age Group							
	21-30		31-40		41-50		51-70	
With Assistants	No	Yes	No	Yes	No	Yes	No	Yes
Log {Grant Intensity}	-0.162	1.295	-0.544	0.816	-0.467	0.868	-1.461	0.561
	[0.988]	[0.549]*	[0.800]	[0.411]*	[1.262]	[0.497]	[1.732]	[0.565]
1{Post-program}	-8.237	-11.294	-1.499	-1.464	-6.605	6.105	-23.737	-10.748
	[12.645]	[9.522]	[9.656]	[7.952]	[14.217]	[9.314]	[23.388]	[9.128]
Observations	709	1482	884	2488	366	2013	317	1989
Villages	147	264	161	355	99	356	88	344
F-stat	1.81	3.52	2.64	3.77	2.32	2.85	1.2	2.89

Table 7.5b The Effect of Grant Intensity on the Hours of Work among the Self-employed by Age: Women

Pre-program period (1993-94)

	Age Group							
	21-30		31-40		41-50		51-70	
With Assistants	No	Yes	No	Yes	No	Yes	No	Yes
Log {Grant Intensity}	-0.46	1.378	1.579	3.246	1.819	0.118	-5.594	0.233
	[1.845]	[1.414]	[1.733]	[1.178]**	[3.657]	[1.338]	[3.096]	[1.450]
1{Post-program}	78.259	3.42	-11.991	35.442	32.268	2.01	-12.405	16.797
	[37.903]*	[22.522]	[31.843]	[19.678]	[38.917]	[19.064]	[33.217]	[23.767]
Observations	245	288	256	541	123	397	198	379
Villages	73	84	72	160	43	132	71	119
F-stat	2.85	2.41	1.92	2.07	1.81	1.63	0.82	1.44

Post-program period (1994-96)

	Age Group							
	21-30		31-40		41-50		51-70	
With Assistants	No	Yes	No	Yes	No	Yes	No	Yes
Log {Grant Intensity}	2.386	-0.594	-1.517	1.308	5.786	-1.829	5.065	-0.555
	[2.993]	[3.083]	[2.801]	[1.397]	[4.354]	[1.958]	[2.666]	[1.690]
1{Post-program}	112.375	-12.323	56.995	104.913	17.883	0.477	9.24	-29.898
	[46.559]*	[48.613]	[46.960]	[40.109]**	[63.850]	[40.819]	[39.166]	[33.214]
Observations	181	171	148	310	82	202	163	246
Villages	51	50	42	87	26	71	48	79
F-stat	1.95	2.12	1.11	2	1.67	1.35	1.34	2.19

Table 7.6a The Effect of Grant Intensity on the Fraction of Workers: Men

Pre-program period (1993-94)

	Age Group											
	10-15		16-20		21-30		31-40		41-50		51-70	
With Assistants	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid
Log {Grant Intensity}	0.491	-0.178	-0.209	-1.011	-0.526	-1.104	0.292	0.205	0.504	0.538	-0.034	-0.251
	[0.749]	[0.240]	[1.219]	[0.736]	[0.742]	[0.644]	[0.420]	[0.582]	[0.492]	[0.662]	[0.532]	[0.568]
1{Post-program}	0.052	-3.148	-11.878	7.472	31.764	-15.047	-10.856	-3.122	7.955	-10.638	9.612	-9.092
	[11.014]	[3.520]	[18.494]	[11.027]	[12.003]**	[10.152]	[6.366]	[8.726]	[7.393]	[9.909]	[8.098]	[8.556]
Observations	9660	9660	5537	5537	9266	9266	8514	8514	5594	5594	5762	5762
Villages	807	807	728	728	807	807	810	810	769	769	727	727
F-stat	3.04	2.07	2.62	2.03	2.23	2.71	1.95	2.14	1.54	1.56	1.69	1.37

Post-program period (1994-96)

	Age Group											
	10-15		16-20		21-30		31-40		41-50		51-70	
With Assistants	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid
Log {Grant Intensity}	-3.238	-0.334	-0.245	0.014	0.017	-0.855	0.267	-1.568	0.536	0.379	0.838	0.144
	[1.099]**	[0.289]	[1.662]	[0.958]	[1.017]	[0.826]	[0.566]	[0.727]*	[0.651]	[0.870]	[0.722]	[0.796]
1{Post-program}	-6.004	-3.241	52.636	21.002	-11.845	16.661	3.198	6.13	6.731	-1.552	5.811	6.019
	[16.111]	[4.564]	[28.394]	[16.397]	[17.595]	[14.153]	[9.491]	[12.123]	[10.337]	[13.452]	[11.426]	[12.516]
Observations	6082	6082	3308	3308	5820	5820	5527	5527	3767	3767	3774	3774
Villages	506	506	436	436	503	503	506	506	489	489	460	460
F-stat	2.8	1.59	2.13	2.37	1.92	2.67	1.9	2.39	1.78	1.52	1.59	1.32

Table 7.6b The Effect of Grant Intensity on the Workers by Age: Women

Pre-program period (1993-94)

	Age Group											
	10-15		16-20		21-30		31-40		41-50		51-70	
With Assistants	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid
Log {Grant Intensity}	0.996	-0.115	-1.766	1.056	-2.18	-0.059	0.242	-0.402	-0.871	-0.575	-0.138	-0.478
	[0.734]	[0.203]	[1.120]	[0.503]*	[0.823]**	[0.365]	[0.945]	[0.372]	[1.228]	[0.494]	[1.193]	[0.517]
1{Post-program}	-3.034	-7.89	1.756	-17.473	36.088	-6.779	48.878	-2.319	17.21	2.421	43.004	-14.228
	[10.767]	[2.978]**	[17.234]	[7.638]*	[13.422]**	[5.784]	[13.935]**	[5.437]	[19.397]	[7.752]	[16.860]*	[7.264]
Observations	8689	8689	5650	5650	10774	10774	8618	8618	5470	5470	5590	5590
Villages	799	799	724	724	823	823	815	815	760	760	691	691
F-stat	3.36	1.93	3.82	2.5	5.61	2.33	4.73	1.89	3.31	2.48	2.69	1.81

Post-program period (1994-96)

	Age Group											
	10-15		16-20		21-30		31-40		41-50		51-70	
With Assistants	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid	Unpaid	Paid
Log {Grant Intensity}	-2.776	-0.202	-2.266	-1.322	-3.211	-0.016	-2.814	0.526	-5.245	0.269	-4.983	0.502
	[1.010]**	[0.302]	[1.537]	[0.690]	[1.108]**	[0.468]	[1.187]*	[0.466]	[1.662]**	[0.697]	[1.551]**	[0.678]
1{Post-program}	3.14	5.267	49.894	10.166	3.324	11.993	14.375	1.74	41.148	-8.803	3.795	2.356
	[13.934]	[4.481]	[27.918]	[12.520]	[18.829]	[7.875]	[19.088]	[7.410]	[28.263]	[11.656]	[23.114]	[10.065]
Observations	5594	5594	3427	3427	6758	6758	5778	5778	3513	3513	3694	3694
Villages	500	500	439	439	511	511	512	512	468	468	446	446
F-stat	3.08	1.56	3.57	2.96	5.04	2.47	4.64	2.38	2.62	1.69	2.39	1.63

Table 7.7 The Effect of Grant Intensity on Per Capita Monthly Household Expenditures

Pre-program period (1993-94)

Expenditure on	All	Food	Non-food
Log {Grant Intensity}	0.009	0.007	0.014
	[0.004]*	[0.004]	[0.005]**
1{Post-program}	-0.066	0.105	-0.532
	[0.053]	[0.057]	[0.075]**
Observations	27237	27237	27237
Villages	817	817	817
F-stat	23.08	20.2	26.64

Post-program period (1994-96)

Expenditure on	All	Food	Non-food
Log {Grant Intensity}	0.011	0.008	0.016
	[0.005]*	[0.005]	[0.007]*
1{Post-program}	0.623	0.664	0.287
	[0.078]**	[0.082]**	[0.110]**
Observations	17868	17868	17868
Villages	513	513	513
F-stat	18.59	16.94	19.57

Table 7.8 The Effect of Grant Intensity on School Attendance

Pre-program period (1993-94)

	Age Group							
	7-12		13-15		16-18		19-25	
Sex	Men	Women	Men	Women	Men	Women	Men	Women
Log {Grant Intensity}	-0.366	-0.845	0.801	-1.561	0.322	0.833	0.642	0.562
	[0.558]	[0.599]	[1.401]	[1.542]	[1.361]	[1.325]	[0.569]	[0.423]
1{Post-program}	9.164	21.601	-11.487	19.383	-0.608	16.127	-1.039	2.43
	[7.836]	[8.960]*	[20.938]	[22.371]	[21.274]	[20.590]	[9.016]	[6.605]
Observations	14949	13975	3977	3421	3241	2899	6448	7497
Villages	819	825	663	623	613	563	745	788
F-stat	2.14	2.12	2.07	1.92	2.13	2.09	1.32	0.93

Post-program period (1994-96)

	Age Group							
	7-12		13-15		16-18		19-25	
Sex	Men	Women	Men	Women	Men	Women	Men	Women
Log {Grant Intensity}	0.406	0.661	-0.92	-3.783	0.992	-1.897	0.885	1.009
	[0.794]	[0.809]	[1.905]	[1.935]	[1.904]	[1.868]	[0.757]	[0.548]
1{Post-program}	-19.288	-4.888	6.322	-28.836	-39.727	22.171	-19.222	-8.97
	[11.823]	[11.894]	[29.317]	[29.524]	[34.972]	[31.863]	[13.181]	[9.556]
Observations	9535	8928	2496	2229	1905	1760	4022	4674
Villages	513	511	422	389	347	332	461	489
F-stat	2.02	2.2	1.84	1.82	2.03	1.89	1.42	1.15