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## Incentive Effects of Transfers within the Extended Family: The Case of Indonesia

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# Incentive Effects of Transfers within the Extended Family: The Case of Indonesia

By Dana Schueler<sup>1</sup>

Draft, January 2007

## *Abstract*

*This study sheds light on the efficiency of informal mutual insurance systems. Evidence on the behavioral effects of remittances and inter-family transfers is still rare. This paper intends to analyse the incentive effects of inter-family transfers in Indonesia with improved econometric techniques. First differences and three-stage least squares are used to analyse incentive effects on working hours. The endogeneity of transfers received and of the number of migrants sent away are explicitly taken into account. Furthermore, different sectors of employment are distinguished in the analysis. The empirical analysis indicates that inter-family transfers have an adverse influence on work effort in the informal and non-agricultural sector of the economy. Precisely, household members of working age reduce normal hours worked. No evidence is found that child work is reduced. However, the negative incentive effect is partly compensated by migrants, who are recipients rather than providers of transfers in the short run.*

Keywords: Remittances, Transfers, Incentives, Three-Stage Least Squares

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# 1 Introduction

External remittances, defined as private financial transfers from abroad, are a major source of external financing in developing countries. According to the World Bank, external intra-family transfer flows to developing countries were estimated at 240 billion dollars in 2007 (World Bank, 2006 (1)). Similarly, internal intra-family transfer flows in many developing countries are substantial as well. Cox and Jimenez (1990) review studies on private internal intra-family transfers in developing countries. They find that 20-90 percent of households in developing countries receive private transfers, comprising 2-20 percent of household income. In the same time frame only 15 percent of households in the United States received such transfers, comprising only 1 percent of household income on average. Due to the high volume of external and internal intra-family transfers in developing countries, researchers have asserted their potentially positive impact on development. The literature has suggested that intra-family transfers could help to reduce poverty, help smooth household income, ease capital constraints and increase household expenditures in areas like education, health or entrepreneurship. On the other hand, one might expect that intra-family transfers trigger the same adverse incentive effects as public transfers.

This paper aims to further deepen the research on the economic effects of intra-family transfers. It will evaluate the concerns raised regarding the indirect effects of remittances on household income through changes to the labor supply. Very little research has been done on this issue to date, and development practitioners are only beginning to be concerned with the indirect impacts of remittances. Due to data availability this analysis concentrates on internal intra-family transfers. It is possible to translate the results on economic effects of internal remittances into the context of external remittances. Both are like any other form of cash/in-kind transfer received by the household. More common characteristics are shared by internal and external remittances. External remittances are associated with an even worse informational asymmetry between giver and recipient of the transfer.<sup>2</sup>

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<sup>2</sup> Furthermore, as empirical studies like that of Adams (1996) show, the cost of international migration are higher. Therefore relatively more wealthy households send members abroad. These sending households also have in common that their labour market situation is likely to be better. This implies that endogeneity problems might be less severe. It is more unlikely that a situation occurs where a job loss or reduction in working hours draws remittances, than

A number of studies point to reduced participation rates as a consequence of remittances (Itzigsohn, 1995; Funkhouser, 1992). The shortcoming of these studies is that they do not take the endogeneity of remittances into account. The only study so far controlling for endogeneity when examining the incentive effects of external remittances on working hours is that of Andersen and Tejerina (2005). The contribution of this paper is to take into account endogeneity and evaluate the robustness of the results using different economic techniques.

In the Indonesian context, the research so far has investigated whether intra-family transfers act as an old-age support system and therefore as a substitute for the labor supply of elderly Indonesians. The information provided in the Indonesian Family Life panel data survey on migration and internal remittances is extremely rich and of high quality which is not found in any other survey to the knowledge of the author. Panel data on remittance flows are rare. The advantage of this data in addition to the panel character of the information is the symmetry of information about transfer givers and recipients and the amount of transfers in cash and in kind that flows from migrants to the household of origin and from the household of origin to migrants. This gives a more complete picture of transfer flows and allows to calculate the net amount of transfers received in a given year. The net amount might not only be important for evaluating incentive effects but also for analyzing welfare effects.

This paper differs from earlier studies reconsidering incentive effects on the labor market in that it examines whether there exist adverse incentive effects of intra-family transfers on working hours rather than on labor market participation of the working age population. Theory does not predict exit from the labor market but less exertion of effort and therefore a reduction of normal hours worked. Furthermore it is easier to condition a remittance contract on labor market participation since it might be possible to receive information of trusted witnesses.

The theoretical framework can be described shortly. Transfers cause a positive income effect. As a result, if leisure is considered a normal good, more leisure will be consumed. However, it might be that the stream of transfers an individual receives over time is incentive-compatible in that it does not react to all household income shocks perfectly. In other words, if transfers do not provide perfect insurance, the

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a situation where remittances lead to an reduction in working hours.

disincentive is clearly reduced. In this case the household has to put in effort on his own in order to maximize the probability to be able to cover the cost of shocks. Due to the imperfectness of observability of effort between givers and recipients an incentive compatible contract is not possible.<sup>3</sup> Furthermore, the informational asymmetry between migrants and household members left behind makes it impossible to evaluate whether the recipient supplemented the insurance provided through the family network with formal or other informal insurance.<sup>4</sup>

Another contribution of the paper is to distinguish between different sectors of employment, which has not been done before. First of all, the formal and the informal labor market are analyzed separately. This is based on the indisputable fact that formal sector workers are less flexible in adjusting their working hours, and that the costs of doing so might be higher for them. Furthermore, there is the possibility of oppositional effects of transfers between sectors. Whether an individual works mainly in the subsistence agricultural or the non-agricultural sector has major implications on the impact of transfers. Migrants may restrict household production in agriculture since missing labor is difficult to replace in the agricultural sector (Rozelle, 1999). Furthermore, in rural areas credit market constraints might be more severe. Engagement in the non-farm sector might become possible through remittances. Rural areas, however, also face missing opportunities of non-farm engagement. Therefore it is unclear whether remittances can give the incentive to start working in the non-farm sector. More importantly, the relaxation of the credit constraint might lead to investment in better technology. This clarifies that a focus on working hours might be flawed. In the agricultural sector disincentive effects should instead be measured by investigating a potential reduction in productivity of the farm household.<sup>5</sup>

The results indicate that there exists an adverse incentive effect on work effort created by a positive net remittance flow. Results are robust to use of different measures of remittances. Considering the family members of working age as a whole this effect is significant in size. It is hard, however, to determine whose reaction drives

<sup>3</sup> The sending household and the migrant live in different villages or even provinces.

<sup>4</sup> The data presented and analyzed in Section 4 indicate that informal workers have access to other, non-family informal insurance schemes, as well.

<sup>5</sup> A negative sign of the variable "transfers" may more realistically imply the substitution of labor by more productive assets.

the result. Nevertheless the empirical analysis shows that remittances cause positive welfare effects at the household level by insuring the household at least partly against shocks.

This chapter is structured as follows. Section 2 provides a literature review on the allocation of remittances in general and incentive effects found in empirical research of public and private external or internal transfers. Section 3 will summarize the theory behind the empirical analysis. The general empirical analysis presented at the outset of Section 4 does not distinguish between different sectors. Subsection 4.5 presents the empirical findings for the different employment sectors. Section 5 concludes and outlines future research questions.

## 2 Literature Review

### 2.1 Motives for Transfers

Before reviewing the literature on the effects of transfers found, the theoretical and empirical evidence on the motives of transfer providers will be briefly reviewed. These motives may give some initial insight into the effects. Since altruistic or reciprocal motives are likely to generate transfers that insure the household, it could be hypothesized that these transfers are therefore more likely to produce negative incentive effects. Gatti (2005) however shows that this need not be the case.

Gatti (2005) hypothesizes that an altruistic motive of giving leads to perfect insurance of household members through migrants' transfers if there were no informational asymmetries between migrants and household members left behind. The more insurance is provided by migrants the less effort household members have to exert to avoid a shock. However, if the assumption of no informational asymmetries does not hold the picture changes. Gatti (2005) highlights that an incentive-compatible contract nevertheless is consistent with an altruistic motive of giving. She puts forward an incentive compatible pattern of transfers in an altruistic model of the family. Here, recipient's effort is endogenous and transfer providers only have imperfect information on recipient's income realizations. If transfer providers can credibly commit to a pattern of transfers, they will underinsure the recipient. Thus transfers react to shocks but do not fully cover the cost of shocks. Therefore the recipient

household still has to put in effort to avoid the shock. Provider's money is not "wasted". When looking at one single extended family, transfers are higher for recipients with higher income than for those with lower income. If this is the case the disincentive effect of transfers should be rather small in size. The same model can be build with reciprocity as the underlying motive.

Empirically the insurance motive of remittance givers can be clearly found (Wolff et al., 2007; World Bank, 2007; Azam and Gubert, 2005). Little evidence has been found in the literature on the existence of purely altruistic transfer givers, that is givers that give without any self-interest.

Lucas and Stark (1985) question the idea that pure altruism can explain remittance behavior in the extended family. First, they hypothesize and indeed find empirical evidence that self-interest or egoism is an important motive. Competition for inheritances, for example, may explain why wealthier households receive more remittances. Second, they find that remittances may be motivated by the desire to return home without shame. Lucas and Stark's (1985) results also indicate that remittances are part of a loan contract with the family or reciprocal exchange: parents pay for their children's education and children in return remit resources to repay these costs.

A series of papers has analyzed the motives of transfers within the extended family using the Indonesia Family Life Surveys (IFLS), which are also used in this paper. Park (2003) estimates the motives separately for the parent-to-child, child-to-parent, and inter-sibling relationship using the first wave of the survey from 1993. His findings suggest that the parent-to-child relationship is driven by the motive of exchange for filial services, whereas children seem to provide old-age support to parents, and siblings seem to help mainly younger siblings who have less income and assets.<sup>6</sup>

Frankenberg et al. (2002) find that even transfers between parents and children cannot be explained by a single theory, but that three motives are consistent among them. Using the same survey data as Park (2003), their findings indicate that transfers may be a source of insurance, based on an educational loan contract, or an exchange for time. Raut and Tran (1998) use the same dataset as the aforementioned

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<sup>6</sup> The shortcoming of a study such as Park's is that it does not take into account the transfer amount given by the recipient when analyzing the amount of transfers received by the recipient. Therefore the analysis is incomplete and it cannot be judged from the results whether altruism or reciprocity is the reason of giving.



authors but find no evidence for the pure educational loan contract hypothesis, and interpret the results instead as pure reciprocity. The two motives are strongly alike. Cameron and Cobb-Clark (2005) use the same IFLS 1993 dataset to investigate old-age support strategies of elderly Indonesians given the lack of a public insurance scheme. They find little evidence that transfers from children or co-residence with children acts as a substitute for the elderly parents' need to work.

Transfer behavior, especially that between parents and children, generally seems to be determined by reciprocity. A reciprocal motive of giving is in line with an insurance motive of givers. Transfers might be part of a mutual insurance system between migrants and household members. This insurance motive of giving is in line with the following theoretical argument of disincentive effects of remittances which are the more pronounced the better the recipient is insured.

## 2.2 Incentive Effects of Transfers

One of the most well-known empirical studies demonstrating the disincentive effects of transfers is that of Bertrand et al. (2003). Under the South African pension program, the elderly receive cash transfers equal to roughly twice the average per capita income of Africans. The results indicate that prime-age individuals reduce their working hours significantly as a response to transfers received by the household. The authors also find that transfers cause the labor supply to decline. Klasen and Woolard (2005) find that households with access to state support attract unemployed relatives and that this household formation response draws away some unemployed from employment opportunities. Using the same data, Posel et al. (2006) additionally investigate the labor supply of household members who leave to find work. The authors find that rural African women are significantly more likely to be labor migrants if the household they belong to receives pensions. To sum up, disincentive effects are created through the attraction of unemployed to the household. However, only a part of prime-age adults are affected negatively. Females seem to use the increase in household income by investing in temporary migration to seek employment.

One of the first papers dealing with the topic of the economic effects of remittances is that of Funkhouser (1992). For Nicaragua he finds a negative effect of remittances

on the probability to participate in the labor force. Concerning the employed he finds a higher probability to be self-employed for those who receive higher remittances. During the period under study, the author detects that migration took place not only for political reasons but also because of the worsening economic situation in Nicaragua. This implies that unemployment of a household member may be the reason for others to migrate and send remittances. This possible endogeneity of remittances is not considered, however.

Similarly, Itzigsohn's (1995) empirical results suggest that receiving remittances leads to a higher probability of not participating in the labor market. His analysis is based on 1991 data for Jamaica, Haiti and the Dominican Republic. The aim is to analyze whether remittances allow households to send fewer people into the labor market when unemployment is high or whether they simply allow people to avoid taking less desirable jobs. However, again, this argumentation and interpretation is questionable since the endogeneity of remittances is not controlled for. The endogeneity arises because the direction of causality can run in both ways. The involuntarily unemployed attract remittances and remittances may cause a voluntary withdrawal from the labor market.

A more recent analysis of the impact of remittances (internal as well as external remittances) in Nicaragua is the one of Andersen and Terjerina (2005). This study has the advantage of analyzing panel data over the years of 1998 and 2001 which can be characterized as a period of an economic upturn. Overall, average normal working hours per week rose between those years, but significantly less so for people receiving higher amounts of remittances in 1998. It might be nonetheless possible that those households that received higher amounts of transfers in the past are more disadvantaged in finding a regular employment or are even partly excluded from the economic boom. Andersen et. al. do not control for this possibility in their empirical analysis. Furthermore, Andersen and Terjerina (2005) do not state that they take into account a possible selection bias by including only households that received positive remittances in 1998.

Besides the paper of Andersen and Terjerina (2005), all aforementioned studies investigate the effect of remittances in a period of economic crisis. Thus even if panel data are available it is not clear whether the crisis or remittances drive the result.

This paper will therefore also consider data that do not coincide with an overall economic downturn.

In developing countries credit markets are imperfect and remittances may therefore allow profitable investment that would otherwise not have been undertaken by households with little wealth (Woodruff et al., 2001). Woodruff et al. (2001) concentrate their analysis on urban areas. They seem to find some evidence on the aforementioned hypothesis in Mexico. Individuals born in states of Mexico characterized by high migration rates into the U.S., are more likely to own a micro-enterprise.<sup>7</sup> The effect found could also be driven by returning migrants that invest their savings rather than remittances.

Yang's (2005) panel analysis for the Philippines shows that positive transitory remittance shocks through currency appreciation coincide with an increase in hours worked in self-employment and are correlated with recipient households' entry into relatively capital-intensive enterprises. Furthermore, the positive income shock coincided with a reduction of child labor. Though the variable used to measure a positive remittance shock is clearly exogenous to labor supply, it might capture the effect of a positive macro- and meso-level development on household behavior instead of the intended effect of remittances.

Moreover, there is literature on the economic effects of migration and remittances in the agricultural sector. As Lucas (1987) shows, there can be two distinct effects of migration and remittances in rural areas. Migration may lead to a reduction in output in the short run, remittances however increase output in the long run by relaxing the capital constraint of households.

Rozelle et al. (1999) investigate the linkages between migration, remittances, and agricultural productivity using three-stage least squares. Household members who leave the farm may not be exchangeable because on-farm labor markets work imperfectly. Remittances may compensate for this foregone labor by releasing the capital constraint of the household. The authors conclude that migration and remittances exercise a negative net impact on maize production in rural northeast China. Some studies including Collier and Lal (1984, 1986) and Bates (1976) analyze only the compensating effect. They find that recipient families indeed hold more productive

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<sup>7</sup> They were not able to analyze entry and into and exit from the micro-enterprise sector.

capital than others. Azam and Gubert (2005) emphasize that remittances act as an insurance contract in the extended family that may give rise to moral hazard. Their results suggest that recipients use productive resources significantly less efficiently than households without migrants. They do not, however, analyze the separate effect of foregone labor.

The recent evidence on the economic effect of migration and remittances in the agricultural sector puts Lucas' early results into question. Indeed recent studies find evidence of a negative incentive effect of remittances by creating moral hazard.

Overall the literature review indicates that economically significant disincentive effects of remittances in the non- as well as agricultural sector are prevailing. The migrant effect is no disincentive effect as such. It might capture a transition away from agriculture in developing countries, where the rural and urban non-farm sector is said to gain in importance.

### 3 Theoretical Framework - Intuition

The analysis presented in this paper focuses on internal remittances and less so on external remittances. The main difference between internal and external remittances is that the former more often flow in two directions, from migrants to the household of origin and the other way round.

Individuals can be assumed to be rational in the sense that they only consider the net amount of transfers they received when making decisions on labor supply. This assumption might be criticized because the provider's decision to give and the recipient's decision to give are made at two quite distinct points in time. However, if we consider the exchange of money as a repeated interaction<sup>8</sup> that took place over several years, then we can even assume that the recipient is well informed and is able to estimate the expected amount of net transfers he or she might receive. Migrants and left behind household members know the characteristics of each other quite well and can judge each others sensitivity to shocks. Furthermore household members learned in the past whether it is likely that a migrant will be successful given his/her

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<sup>8</sup> This assumption is clearly underlined by the data used. Migrants and the household of origin stay in contact over several years by transferring money.

characteristics.<sup>9</sup> It follows that using gross transfers is inappropriate for examining the incentive effect of internal remittances.<sup>10</sup> The descriptive statistics show that the transfer behavior did not change for a long time horizon. The behavior found in the 2000 wave is similar to that found in the 1993 wave. Therefore transfers can be interpreted as being part of a repeated interaction and that the household can anticipate net transfers. Nevertheless, the empirical analysis analyzes gross remittances also.

Several informational asymmetries exist between migrants and the families they leave behind (Azam and Gubert, 2002). Migrants cannot observe the effort level of left-behind household members perfectly. The effort level determines the likelihood that a future shock causes a severe drop in household income. Migrants can get a general impression through trusted witnesses<sup>11</sup> or by comparing the family's material outcome with neighbors, which as well can be observed only imperfectly. Thus, they cannot use credible threats to punish shirking. Imperfect monitoring produces an incentive to lower effort. This incentive is higher the more reliable the insurance that is provided by transfers. Insurance is provided by potential transfers the household may receive as well. Potential transfers are measured by the number of family members not residing in the household. Uncertainty about the behavior of migrants might reduce the disincentive. Migrants may be an unreliable source of transfers as they may lie about their own financial situation.<sup>12</sup> Shirking by migrants themselves seems rather unlikely since they do not want to lose face in front of their family and want to be able to return home without shame. It seems plausible to assume that migrants receive a positive utility from sending home money. This is especially the case if internal migrants are considered mainly. These might have closer links to their families and face a lower cost to return home.<sup>13</sup>

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<sup>9</sup> Second, motives could differ between recipient and provider or between transfer providers. Therefore the model takes the observable characteristics of household members living outside the household into account. Even if there is no symmetry in motives the argument for using net transfers remains valid. The household does not care about the source of transfers and every transfer is a positive income shock.

<sup>10</sup> Up to now the few studies existent using data on internal remittance flows do not indicate or discuss the use of net transfers. In many surveys, transfers given are not available.

<sup>11</sup> A trusted witness will most likely be a family member or friend living near by. In which case it is not in his interest to prove the information given by the family of origin wrong.

<sup>12</sup> Therefore the household might send more migrants in order to be sure that at least some will send transfers.

<sup>13</sup> If instead a migrant does not plan to return from abroad the incentive to transfer (regularly) might be significantly lowered.

Migrants are also likely to be petitioners themselves. What follows is that the disincentive effect of internal transfers could work in both directions, in the direction of household of origin and in the direction of migrants. This is due to the informational asymmetry on both sides, as explained above. The motive of sending away migrants again is important here. If the motive is for the migrants to look for an employment or take advantage of better opportunities somewhere else, more transfers flow from migrants to the household of origin in all likelihood. If so, it makes sense to analyze disincentive effects on the household. If the motive is to send migrants in order to enable better education, remittances are more likely to flow in the other direction. For this reason the remittance relationship of the households in Indonesia have to be described before analyzing potential disincentive effects.<sup>14</sup>

This paper analyzes the effects of transfers on the incentive to work. The standard economic theory on choices about hours of work tells us that a positive income effect leads to the consumption of more leisure if leisure is considered a normal good. Additionally there may exist an distorting substitution effect if transfers are conditioned on low income of the recipient (World Bank, 2006 (2)). If the transfer is conditioned on low income, the more the transfer insures the household against the low-income state of the world, the less the incentive of the household to put effort into the avoidance of the event.

Due to informational asymmetries transfers can be conditioned on participation in the labor market but not on the effort level, that is, the number of hours worked in the job. It is more easy for migrants to observe labor market participation through trusted witnesses than working hours of members of the household of origin. If a transfer contract conditioned on working hours were possible, there would be no disincentive. Moreover, it is important to bear in mind that the negative effect on working hours will only be observable if the household is able to survive without remittances. If cash and in-kind transfers received by others supplement household income in a way that this **just** guarantees survival, there is less incentive to lower work effort as this would lead to a situation where the household would have to struggle for survival.

The positive income shock might not be exogenous to the opportunities the house-

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<sup>14</sup> To the knowledge of the author working hours and labor supply of migrants in general are often not available in surveys.

hold has to participate in the labor market. In order to separate the effects of opportunities and income shocks the empirical model needs to instrument for income shocks, and control for neediness and opportunities.

No matter whether the transfer is given due to lack of a job or to a limited amount of opportunities, there could nevertheless exist negative effects on incentives. These could adversely affect household members' efforts to look for a new job or a better paid job, or to simply work more hours. As explained above, this is conditioned on the insurance the transfer provides.

A straightforward application of this model would be the informal non-agricultural labor market. In the informal labor market labor supply decisions are very flexible whereas in the formal labor market this is not the case. Furthermore, households working in subsistence agriculture might struggle for survival even if they receive remittances. In rural areas, there are fewer opportunities to engage in the non-farm sector. However, remittances might be used to invest in a better technology. Therefore the focus on working hours might not be justifiable in the agricultural sector. Here, disincentive effects would realize in lower productivity even if better technology is used.

Furthermore, we would expect quite distinct effects of the number of migrants sent away in the agricultural sector. Migrants may constrain the household's production as missing labor cannot be easily replaced in the agricultural sector. The more migrants the household sends away, the more the remaining members need to work.

As in most developing countries a large fraction of the Indonesian population is active in the informal labor market. In such a society, transfers through family networks should play an important role. The Indonesian Family Life Survey data from 2000 additionally show that other informal insurance schemes are existent and widely used in the society. Thus, the possibility of overinsurance, that is topping up the (incentive-compatible) family insurance through transfers with other insurance, exists in both the formal and the informal sector.

To sum up, informational asymmetries lead to an incentive to shirk that results most likely in a reduction of working hours. This will only occur if the household is not credit- and at the same time opportunity-constrained.

## 4 Empirical Analysis

### 4.1 Description of the Data

The empirical analysis is based on the Indonesian Family Life Surveys 1 and 3 (IFLS), a panel survey representative of 83 percent of the Indonesian population living in 13 of the 26 Indonesian provinces in 1993. The first wave collected detailed information on individuals living in 7,224 households. The third wave of 2000 tried to re-interview the entire 1993 sample. The second wave of the panel survey from 1997 cannot be used because the employment data still have not been released. Due to high re-contact rates of 95.3 percent the possible problem of non-random attrition is relatively low. 6,564 households or 90.9 percent of the IFLS 1 sample were interviewed in all three waves.

The wave of 2000 and that of 1993 collect detailed information on the transfers a household received or provided, and the insurance status and employment characteristics of household members. The data on transfers consist mainly of transfers to and from migrants inside of Indonesia. Only very few households indicated that family members migrated to other countries. International remittances therefore make up only a minor part of the transfer data collected.

The subject of analysis of this study is the working behavior of household members of working age. Detailed data was collected on the characteristics of migrants, which are the children, parents and siblings of these couples that live outside the household.

The analysed panel sample consists of 4278 households that answered the section on non-coresiding household members and the employment section. Households that indicated that some of the children, siblings and/or parents of the head and spouse of the household live outside of the head's and/or spouse's household in 1993 and/or 2000 are included in the sample.<sup>15</sup>

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<sup>15</sup> The analysis therefore does not consider explicitly households that send away temporary or permanent migrants. It is instead considering all households that can be characterized by non-coresiding relatives (children, siblings, parents) of the head and spouse.



## 4.2 Method of Analysis

The availability of panel data makes a first difference approach a natural starting point of analysis:

$$\Delta W_{i,t-(t-1)} = \alpha + \beta \Delta T_{i,t-t-1} + \gamma \Delta \mathbf{X}_{i,t-t-1} + u_i, \text{ where}$$

$\Delta W_i$  is the change in normal hours worked per week between 2000 and 1993<sup>16</sup> of the  $i$ -th household. It is defined as the sum of normal hours worked of all household members of working age.  $\Delta T_i$  measures the change in remittances between 2000 and 1993 this household receives. It is complicated to control for endogeneity in such a setting. It is unclear whether the decrease in working hours draws transfers or whether the increase in remittances leads to a reduction in working hours. Therefore it would be important to instrument for the change in remittances and estimate the model using two-stage least squares. The advantage would be that we would explicitly model and estimate the effect of a change in remittances on a change in working hours. The inclusion of  $\Delta T_{i,t-1}$  could solve the endogeneity problem. The second wave of the survey, however, can not be used to construct such an instrument. The data are influenced by the crisis that took place in 1997 in Indonesia. Some regions were exposed to a severe draught. Inflation of food prices affected nearly all households. It is therefore clear that such a covariant shock led to a decline in remittances. Therefore I will follow a second-best approach. The initial level of remittances in 1993 is used to predict the change in working hours between 1993 and 2000. The higher the initial level of remittances, the more the household reduces working hours in the future.

$$\Delta W_{i,t-(t-1)} = \alpha + \beta T_{i,t-1} + \gamma \mathbf{X}_{i,t-1} + u_i, \text{ where}$$

$T_{i,t-1}$  is the initial level of remittances received by the household in 1993 and  $\mathbf{X}_{i,t-1}$  is a vector of other household characteristics in 1993. This approach can reduce the endogeneity problem to at least some extent. If it is true that missing

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<sup>16</sup> Note again that the 1997 employment data is not yet released.

opportunities and vulnerability of a household are positively correlated over time and additionally positively correlated with (net) remittances, then the initial level of remittances is not exogenous to the change in working hours. This critique can only be tackled by trying to include variables in the model that should absorb or be highly correlated with the above mentioned meso- or macro characteristics that determine the change in working hours. Therefore variables that measure the proneness to shocks and exclusion from opportunities are included in the regression model.

The model is tested for the household as a whole. It is tested as well for the head and its spouse of working age, because they are the ones controlling household resources. To know whether working-age children, siblings or parents of the household head and spouse show behavioral changes, the model is also tested for these subgroups. It should again be pointed out that the survey provides mainly information on internal migration and internal remittances. Therefore a sample selection bias that could potentially be generated by only looking at those households with international migrants is non-existent. Virtually all households indicate that a close relative of head or spouse lives outside their household. The empirical model can be described as follows:

$$\Delta W_{i,t-(t-1)} = \alpha + \beta_1 \mathbf{X}_{i,t-1} + \beta_2 T_{t-1} + \beta_3 S_{t-1} + \varepsilon_i$$

$\Delta W_i \equiv \Delta$ normal working hours per week of head/spouse/household (sum)

$\mathbf{X}_{i,t-1} \equiv$  Characteristics of the head/spouse/household in t-1

$\mathbf{T}_{t-1} \equiv$  Remittances per head received in t-1

$\mathbf{S}_{t-1} \equiv$  Shocks experienced by the household prior to t

A crucial point is to decide on the measure of internal transfers. Even if theory and also the data indicate that households repeatedly interact, it seems reasonable to check whether the results hold using gross transfers. However, using gross remittances can lead to a sample selection bias. Households receiving gross transfers might be very different from households giving remittances, particularly concerning working hours. The same complication arises when using positive net transfers as

a measure of transfers received. Assigning each household with negative or zero net transfers a zero might further distort the data analyzed. Why not using net remittances? Theory does not predict a symmetry of effects of positive compared to negative net transfers on working hours. This is because a rich household is "rich" enough to give and will not have to increase working hours in the future due to on balance giving transfers. Theory does predict a symmetry of effects between well-insured and under-insured households. Insurance is provided through remittances and might be even topped up, as explained above. If the household is under-insured household members of working age have to exert effort in form of working more hours (in an additional job or by the entry of one more member into the economically active population), to cope with the shock and possible future shocks. Another possible measure of transfers is a Dummy variable which takes the value of zero for all households with zero or negative net transfers and a value of one for all others. A potential sample selection bias is avoided.

Another source of misspecification can result from the use of gross remittances. The amount of gross remittances is expected to be positively related to household income. The share of remittances in household income could be used as a measure instead. But as, for good reasons presented above, the analysis concentrates on net remittances, the relationship between remittances and income is unclear. Richer households might receive more, but also give more. Furthermore, using the share of remittances in household income creates a problem. Household income and working hours are positively correlated. This measure therefore creates a negative correlation between the income share of remittances and working hours by definition.

Due to the aforementioned critique on the approach, the data are also analyzed in the cross-section using the 2000 wave. The analysis focuses on head and spouse, as the first difference approach showed unclear results for this sub-sample of the household. In the cross-section, theory would predict lower working hours for individuals or households that receive higher remittances. A three-stage least squares approach is deemed the best estimation technique in order to control for endogeneity.

Three basic equations shape the empirical model. First of all, normal hours worked  $W$  of the household head or his/her spouse of working age in 2000 are modeled as a function of the positive income shock the household encountered and the potential

insurance provided by non-coresident family members (T and M). Given that the effect of T on normal hours worked in the formal or informal sector is to be determined, only individuals holding a job other than unpaid family work with positive working hours are included in the analysis. The set of characteristics of head and spouse that determine ability and neediness is denoted as vector  $\mathbf{X}$ . The characteristics of coresiding family members are denoted as vector  $\mathbf{Xc}$ . These determine the need to work.<sup>17</sup> The need to work is further controlled for by the variables of asset value per capita owned by the household and non-labor income per capita denoted as  $\mathbf{I}$ . Furthermore, opportunities to work are proxied by the household's assessment whether poor people present in the village are poor mainly due to a lack of opportunities or for other reasons. This dummy variable is denoted as  $V$ . Unfortunately, no other more objective measure of opportunities is available.

$$W_i = \alpha + \beta_1 \mathbf{X}_i + \beta_2 \mathbf{Xc} + \beta_3 \mathbf{I} + \beta_4 V + \beta_5 T + \beta_6 M + \varepsilon_i \quad (1)$$

$W_i \equiv$  normal working hours per week of individual  $i$

Endogenous to this model are two variables: positive internal net transfers and the number of household members that migrated. Remittances may be endogenous because it is not the household members' decision on working hours that is driven by the amount of remittances received, but the decision of the donor to give due to reported missing opportunities of the recipient.

The number of migrants is also endogenous to working hours. Two forms of migration have to be distinguished. First, migrants may generate positive net remittances. Firstly, an individual with few or risky opportunities to work may decide to send some household members away to find better opportunities elsewhere. The more migrants the household has, the likelier the household may receive positive net transfers and the higher the amount of net transfers received. The neediness of a household

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<sup>17</sup> Income earned by other household members could also be included in the regression. Theoretically these transfers are totally different to remittances. Transfers received by the head from within the household do not cause any disincentive effects. This is because no moral hazard problem is existent due to perfect information of co-residing family members. The effect of household income earned by other household members on working hours of the head/spouse is positive and significant. Results are not reported here.

may therefore determine the number of household members sent away from home. Secondly, the more household members are living outside the household, the more transfers the household itself might have to give. If this is the case the head or his/her spouse has to work in order to finance the transfers. Wealthier households will let household members migrate not for reasons of indigence, but for reasons of better opportunities of employment and education elsewhere. Theory calls this type demand-pull migration. In the latter case households may more likely be characterized by negative net transfers.<sup>18</sup> The reasons why household members migrate will be jointly driven by the two described motives. Most households in the sample receive and give transfers at the same time (see the next section).

In-kind and in-cash internal intra-family transfers<sup>19</sup> are produced by allowing family members to migrate. Given migration, the amount of net transfers received is influenced by household characteristics  $\mathbf{X}$  that also affect the success of migrants and the motivation to return transfers.  $\mathbf{X}_{nc}$  are characteristics of non-coresiding family members, measuring their ability to return transfers.  $\mathbf{S}$  is a vector of shocks that hit the household in the last five years. The instrument  $Z$  in equation (2) is the amount of positive net transfers received from siblings in year 1993. It is used to identify equation (2) and is not correlated with the residuals of equation (1).<sup>20</sup>

$$T_j = \alpha + \beta_7 \mathbf{X}_{ij} + \beta_8 \mathbf{X}_{nc} + \beta_9 \mathbf{S} + \beta_{10} M + \beta_{11} Z + \varepsilon_j \quad (2)$$

$T \equiv \ln$  of positive net transfers per capita, zero otherwise of household  $j$

Note that positive net transfers are logarithmized to prevent the influence of outliers on the results.<sup>21</sup>

The number of household members that migrated in 2000 can be explained by

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<sup>18</sup> Here these households is assigned zero positive net transfers for the reason of avoiding a sample selection bias.

<sup>19</sup> The empirical analysis presented here uses positive net transfers as dependent variable. The model was also run using gross transfers received. The coefficient of gross transfers is still negative, however not significant anymore, in the working hours regression.

<sup>20</sup> The instrument that identifies the transfer regression is not significant if included in the working hour's regression.

<sup>21</sup> Even if some very high values of positive net remittances are thrown out of the sample the results do not change at all.

household characteristics  $\mathbf{X}$  and wealth status  $\mathbf{I}$ . The wealthier a household the more migrants can be sent away. The older the head of the household the fewer other members will be sent away, as the need for assistance in the household increases with age. The number of migrants in 1993 are used to identify equation (3). This can be done due to the large time horizon considered. The number of migrants changed between 1993 and 2000. The correlation coefficient is 0.78. Therefore the migrants counted in 2000 are not a completely redundant measure of migrants counted in 1993. Furthermore the instrument is not correlated with residuals of equation (1) and (2).<sup>22</sup>

$$M_j = \alpha + \beta_{12}\mathbf{X} + \beta_{13}\mathbf{I} + \beta_{14}Z + \varepsilon_j \quad (3)$$

$M \equiv$  number of close relatives (children, siblings, parents) living outside couple's household

The error terms of the three equations are assumed to have zero mean, to have constant variances, and to be independently distributed following the three-stage least squares method introduced by Zellner and Theil (1962). In this system of equations, however, it is possible that the error terms are correlated across equations (1) to (3). This is because all three dependent variables are exposed equally to the shocks a household faces. Therefore iterative three-stage least squares should be used to estimate the model.<sup>23</sup> Before presenting the results of the empirical models, the next section gives an overview of the data used for analysis.

Nevertheless, the three-stage least squares approach is deemed to be the most unreliable when assessing the disincentive effects of transfers. This is because it is complicated to find statistical sound instruments that also make sense from the point of view of economic theory.

<sup>22</sup> The instrument that identifies the migrant regression is not significant if included in the working hour's regression and transfer regression.

<sup>23</sup> The model presented here controls extensively for the shocks the household encountered. The questionnaires of IFLS 2000 and 1993 asked whether the household experienced the death of a household member, the sickness of a household member, crop loss, a natural disaster, a business or job loss, or a decrease in household income. Furthermore the household was asked whether it was negatively affected by the Indonesian economic crisis of 1998.

### 4.3 Descriptive Statistics

The empirical analysis uses a panel dataset. The sample consists of all households which were interviewed in the year 1993 and 2000 and whose head and spouse indicate to have parents non-coresiding and/or non-coresiding siblings and/or non-coresiding children. Tables 11 (see appendix and 1 give an overview of the characteristics of couples and family members living outside of this household. Tables 12 (see appendix) and 2 describe the transfer behavior in 1993 and 2000.

The first row in Table 11 (see appendix) and 1 gives the average number of children coresiding and non-coresiding, of siblings coresiding and non-coresiding, and of parents coresiding and non-coresiding. In general it can be seen that, parents did not live in the same household as their (adult) children and siblings did not live in the same household as their peers in both years. Of these individuals who were no longer residing with family members, 22 percent of the children, 25 percent of the siblings and 0.5 percent of the parents had moved out of the province by 2000. Children and siblings in the household of the couples were younger than those living outside the household. In contrast, parents outside the household were on average younger. Apparently they tend to move in with their children in old-age. Children who do not co-reside are older and therefore have a higher education on average than those who co-reside. In 1993 the same was true for parents non-coresiding. As expected the better educated individuals live outside the household. On the other hand, a higher percentage of siblings co-residing has completed higher education compared to siblings non-coresiding. This may be due to high indirect and direct costs of education, which are more easily borne if one can share the cost of living. Females make up a quite large fraction of non-coresidents: in the year 2000, they make up 51 percent of non-coresiding children, 49 percent of non-coresiding siblings and 60 percent of non-coresiding parents. They seem to move out of the household with marriage. More interesting is the employment situation of non-coresiding family members: 66 percent of the children and siblings and 60 percent of the parents who had migrated are employed.

Tables 12 and 2 describe the transfer behavior of all households whose head and spouse have non-coresiding close relatives. In the year 2000 most transactions take place between siblings, as was the case in in 1993. In contrast to 1993 parents no

Table 1: Characteristics of Householders and Non-Coresiding (NC) Family Members, 2000

	Relatives of Head/Spouse coresiding and non-coresiding							
	Head of hh/Spouse	Children in the hh	Children nc	Siblings in the hh	Siblings nc	Parents in the hh	Parents nc	
Average number per household	1.7	1.7	1	0	7	0	1.6	
Percentage married	80	8.5	81	11	74	17	.	
Percentage not yet married	6	89	16.5	73	17	0	.	
Average Age	43	13	33	30	70	68	59.5	
Percentage with primary education	46	35	46	34	47	37	45	
secondary education	31	31	38	49	31	5	0	
tertiary education	8	4.5	8	10	5	0	1	
Females as a percentage of nc			51		49		60	
Percentage out of province			22		25		0.5	
Percentage working	65	11	66	6	66	4	60	
Mean working hours per week j1	42	41		44		32		
Mean working hours per week j2	23	24		27		17		

Source: Own Calculations.

Note: Table presents average values. Columns 3 to 8 sort the relatives of couples according to place of residence. nc=non-coresiding, hh=household.



longer play a role in transfers in 2000. The importance of children declines between 1993 and 2000. The 2000 survey indicates that 35.5 percent of the couples are net transfer recipients and 39 percent are net transfer providers.<sup>24</sup> This shows the importance of looking at net rather than gross transfer flows. 25 percent indicate that they do not receive and provide transfers though relatives live in a different household.

There is a large discrepancy between the mean and the median of net transfers received. Transfers vary widely overall. This gap between mean and median is however not due to one or few outliers. Other studies have also found a highly variable pattern of transfers. For the empirical analysis the original data are therefore transformed by taking the natural logarithm of the original values. Figure 1 shows that after the transformation the distribution of transfers does not exhibit outliers anymore. In the median, households receive positive net transfers of 194 US Dollar (PPP adjusted) in 2000 and the mean amount is 767 US Dollar (PPP adjusted). As a percentage of income, this results in a median percentage of 7.5 percent and a mean percentage of 62 percent. Thus households receive a significant amount of income through transfers.

It is of interest, furthermore, to compare average normal hours worked in 2000 of those working-age heads and spouses living in households that received positive, negative, and zero net transfers in 1993. This gives a first insight into the relationship between transfers and working hours, but causality is unclear. In the year 2000, the mean for heads with zero net transfers is given by an average of 44 hours worked normally per week, that of individuals with negative net transfers (net givers) is also 44 hours, and that of those with positive net transfers (net recipients) is 42 hours. Furthermore average normal working hours increase the least for heads and spouses which receive positive net transfers in 1993. The average change in normal working hours given the change in positive net remittances is also informative. The normal hours worked of those with an increase in positive net transfers drop by one hour, while the normal hours worked of those experiencing no change in net transfer increases and of those with a decrease in positive net transfers increases as well.

For the household as a whole normal working hours per week increase between 1993

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<sup>24</sup> The other couples did not receive or provide transfers even though some of their close relatives live outside the household.

Table 2: Transfer activities and flows 2000 PPP USD

	All	Children	Siblings	Parents
received and/or given to				
Percentage of households who:				
receive or give transfers	78	18	76	0.6
receive transfers only	16	7	14	0
both receive and give transfers	42	8	37	0.1
give transfers only	19	3	20	0.4
on balance receive net transfers	35.5			
on balance give net transfers	39			
on balance receive/give zero	25			
Transfer flows:				
Mean net transfers received	104	-1	106	-1
Mean per capita household income	3372			
Mean per capita household asset value	8212			
Median net transfers received	0	0	0	0
Median per capita household income	947			
Median per capita household asset value	2808			
Net transfers:				
Percentage of households with positive net receipts	35.5	12	28.5	0.1
Median amount received	194	129.5	162.5	39
Mean amount received	767	383	797	39
Median percentage of income	5	3	4.5	2
Mean percentage of income	11	10	11	2
Percentage receiving less than 10 percent of income	55	58.5	59	86
Percentage receiving more than 50 percent of income	14	13	12.5	0
Percentage of households with negative net receipts				
Median amount given	39	5	39	0.5
Mean amount given	227	108	194	129.5
Median percentage of income	1031	739	946	186
Mean percentage of income	4	2	4	3
Percentage giving less than 10 percent of income	9	8	8	5
Percentage giving more than 50 percent of income	66	76	68	77
Number of households in overall categories	7	7	6.5	2
Source: Own calculations	2991	527	2263	17

Note: The category "All" includes all households with non-coresiding children, sibling and parents (relatives of head or spouse). Children, siblings and parents are non-coresiding relatives of head or spouse. The categories "Children", "Siblings" and "Parents" include only those households with children, siblings or parents non-coresiding. The category "All" displays higher percentages than the subcategories Children, Siblings, Parents since households may be doing transfers to several groups.

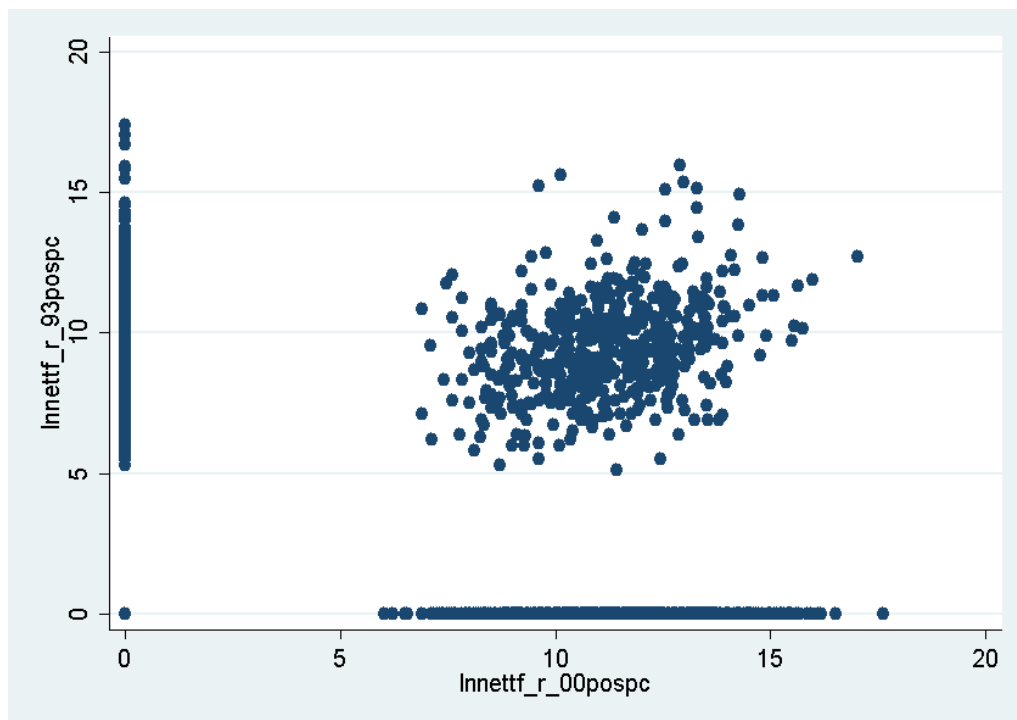


Figure 1: Natural logarithm of net positive transfer received 1993 and 2000

and 2000 on average by 22 hours. This might be due to increased opportunities to work for the household members, partly to children which have not been of working age in 1993, and partly to a change in the structure of the household, meaning the group of individuals forming the household. The increase in labor supply is the lowest for households that receive positive net transfers in 1993 with a change by 19 hours. It is the highest for those receiving zero net transfers (23 hours) and slightly lower for those receiving negative net transfers in 1993 (22 hours). No such clear picture evolves when looking at the change in positive net transfers.

Table 3

	<i>working hours (2000)</i>		<i>change in working hours</i>	
	head/spouse	household	head/spouse	household
<i>net transfers (1993)</i>				
positive	42	75	0.4	19
zero	44	79	3	23
negative	44	83	3	22
<i>change in net transfers</i>				
increase			-1	22
constant			5	21
decrease			4	21

Source: Own Calculations.

Note: These are working hours or changes in working hours of individuals of working age.

## 4.4 Results

### 4.4.1 First Differences Approach

As theory does not clearly predict whether there might be a difference in the size and existence of disincentive effects between the head and his/her spouse and other co-residing household members, the model is also tested for the household as a whole. One can argue that the head and his/her spouse are the ones being the best informed of household resources available and can most completely dispose of household resources. Therefore it might be especially them that have the incentive to exert less effort given a positive income shock.

Table 4<sup>25</sup> presents the results if the unit of observation is the whole household.

<sup>25</sup> Residual plots are shown in appendix in Figures 2 to 6. The plots show that heteroscedasticity seems to be problematic. Therefore White-corrected standard errors were calculated.



Table 5: First Differences - Normal Hours Worked per Week - Subgroup Analysis  
 Dependent variable: change in normal hours worked per week

1993-2000	(1-1)	(1-2)	(1-3)	(2)
	Head/Spouse	Head/Spouse	Head/Spouse	Children of working-age
asset value	-0.111 (0.22)	-0.057 (0.20)	-0.060 (0.21)	-0.051 (-0.12)
non-labor income	-0.104 (0.48)	-0.173 (1.40)	-0.169 (1.37)	-0.255 (-1.34)
positive net transfers 1993	-0.576 (0.92)	-0.228* (1.71)	-0.238* (1.79)	-1.297 (-2.38)**
rural	2.628 (1.12)	1.499 (1.17)	1.429 (1.11)	-6.308 (-3.12)***
age of head 1993	-1.015*** (9.72)	-0.891*** (14.04)	-0.881*** (13.85)	0.400 (5.23)***
female head	3.873 (1.15)	3.575 (1.64)	3.830* (1.75)	3.470 (1.24)
primary education head 1993	1.065 (0.35)	0.612 (0.33)	0.650 (0.35)	
secondary education head 1993	2.166 (0.56)	1.538 (0.70)	1.447 (0.66)	
tertiary education head 1993	1.369 (0.21)	2.054 (0.61)	1.925 (0.57)	
poor due to no opportunities	1.182 (0.46)	1.415 (1.00)	1.376 (0.97)	7.761 (3.48)***
<i>household shocks:</i>				
shock prior to 1993	-9.968* (1.96)	-3.967 (1.25)	-4.052 (1.28)	-6.470 (-1.45)
<i>characteristics of m. co-residing</i>				
percentage primary education	5.969 (1.11)	8.422*** (2.66)	8.649*** (2.73)	43.707 (9.24)***
percentage secondary education	8.124 (1.17)	12.261*** (3.08)	12.526*** (3.15)	52.070 (8.89)***
percentage tertiary education	6.227 (0.19)	15.897 (1.13)	16.436 (1.17)	106.206 (3.89)***
Normal working hours 1993				
constant	42.920*** (4.32)	33.387*** (6.80)	33.179*** (6.75)	-0.886 (-6.38)***
Number of observations	1174	3968	3968	1280
Adjusted R-squared	0.10	0.06	0.06	0.17
Source: Own calculations				
T-statistic in parenthesis. Note:*0.1, **0.05, ***0.01 Significance level.				

Note: The second specification (1-2) use only those households receiving positive net transfers. The first specification assigns households with negative or zero positive net transfers a zero for positive net transfers.

The dependent variable of the regressions is the change in normal working hours per week between the years 2000 and 1993. Working hours are the sum of working hours of all individuals of working-age living in the household. I do not consider the "working hours" of those who indicated to be engaged in unpaid homework. A significant negative effect of all measures of transfers on the household's normal hours worked is found in all specifications. The results are robust to the inclusion of normal working hours in 1993 in the regression. From the descriptive statistics we know that working hours for the household as a whole increased, the least so for households having received positive net transfers in the past. Those households seem to have less incentive to increase working hours because they received income through other sources.

Those households that received positive net transfers in 1993 might be disadvantaged in opportunities to work compared to other households. Therefore the regressions include a dummy for whether the household experienced a shock in the years prior to 1993 that led to a decrease in household income due to a natural disaster or other macro/meso-type shock. Furthermore, the variable "poor due to no opportunities" indicates whether the majority of inhabitants of the village or town is of the opinion that the poor stay poor due to no opportunities in the village or town to overcome poverty. This variable should capture opportunities available to the household. The positive and significant effect of it on the change in working hours indicates that households living in those villages seem to exert even more effort through an increase in working hours. The existence of shocks is significant in determining the change in hours worked. Having experienced a shock detrimental to household income in the past goes along with a significantly less increase in working hours. Nevertheless the criticism on endogeneity of net transfers cannot be rejected fully.

Furthermore, the results show that a higher percentage of educated individuals in the household in 1993 the higher the increase in working hours. This is driven partly by the entry of household members into the labor force that were inactive in 1993. Moreover, participation in an economic upswing might take the form of resuming an additional job (inside the company or in another firm) and not by finding a job that is better paid.

The finding that the change in working hours was lower for those with higher initial

working hours might indicate convergence. Normal working hours per week cannot be extended to infinity. Therefore it seems plausible that this result does not indicate measurement error but convergence of normal hours worked per week.

The following regression are individual-level regressions concentrating on the head and his/her spouse. Specification (1) and (1-2) differ in the measure used for positive net transfers in 1993. The former specification concentrates on households with positive net transfers only. The explanation power of the regression can be increased significantly through the inclusion of normal hours worked in 1993. A significant and negative effect of net transfers on normal hours worked is found in specification (1-3). A further individual-level specification was tested without females. Including normal working hours in 1993 renders the variable of positive net transfers insignificant. This table presents also evidence that normal hours worked of children of working-age living in the household are reduced through remittances. This might indicate that children are able to stay in school or university if the household gets assistance. These individual-level regressions are, however, not robust to the use of other measures for the positive income shock, besides the use of gross remittances received.

Overall, the presented results show that remittances seem to have indeed a negative effect on the work incentive of the household. The size of the effect ranges from a mean reduction of 0.2 to 2 in the household's normal working hours per week triggered by a one percent increase in remittances depending on the measure of net transfers used. Correcting for inflation, positive net remittances increased by 40 percent in the median between the two years. This has therefore approximately led to a decrease of 8 to 80 hours worked per week at the aggregate household level.<sup>26</sup> Normal hours worked of the household as a whole increased from an average of 58 hours in 1993 to an average of 80 hours in 2000. The effective disincentive created is therefore severe. This estimate might not represent the true dynamic effect since it only measures the static effect of a certain difference in transfers received between households on the change in normal hours worked. The evidence on behavioral effects for the head and spouse are mixed. A different approach is therefore used to

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<sup>26</sup> This figure is a pure approximation and should be interpreted cautiously. It is not directly tested in the regression model. The level, not the change in transfers is used as explanatory variable due to the aforementioned endogeneity problems.



analyze this case more deeply.

#### 4.4.2 Three-Stage Least Squares Approach

Because the explanatory power of the model for the year 2000 cannot be judged using 3SLS, ordinary least squares regressions were run to evaluate the explanatory power. The sample investigated includes all heads and spouses of working-age that work and have sent away migrants. Results are reported in table 15 in appendix. Regression 1 shows that richer households send away more migrants. The age of the household head or his/her spouse is negatively related to the number of migrants sent away. There seems to be a tendency of co-residence in old age. Household income and age cannot be used in the three-stage least squares regression as both variables are not exogenous to transfers and working hours. This leaves the number of migrants in the year 1993 as sole explanatory variable. Not surprisingly, the explanation power of the regression is driven by it. The R-squared remains at 60 percent. Regression 2 shows that only 4 percent of the variation of positive net transfers per capita can be explained when households receiving negative and zero net transfers are assigned a zero for positive net transfers. Excluding these individuals, 28 percent of the variation is explained. Finally, regression (3) explains 6 percent of the variation in normal hours worked in the year 2000. Even the inclusion of normal hours worked in 1993 does not increase the explanation power. A Hausman test is performed to assess whether endogeneity is indeed problematic. It indicates that OLS would be inconsistent and that three-stage least squares is the correct and dominant estimation method.

The results of the 3SLS approach<sup>27</sup> are presented in table 6.<sup>28</sup> In both regressions 1 and 2 one specific identifying variable is used. The instrument in regression 1 is the number of migrants in 1993. Positive net transfers from siblings of 1993 instrument for net transfers in 2000. Both instruments are not correlated with the residuals of the working hours regression.

Regression 1 finds that migrant networks exist over time and are associated with more migrants sent away in following years. Column 2 shows the regression ex-

<sup>27</sup> I have to strongly caution against overvaluing the results of this approach since it is hard to find good and also theoretical convincing instruments. The above mentioned first difference approach is clearly dominant.

<sup>28</sup> The graph 7 in appendix shows that residuals show no heteroscedastic pattern.

Table 6: Three-Stage Least Squares Regression: Incentive effect on working hours of head/spouse

1999/2000	(1)	(2)	(3)
	Migrants	Positive Net Transfers	Normal Working Hours
Number of migrants		-.0125 (-0.48)	-.2125** (1.98)
positive net transfers			-.6266** (-1.91)
non-labor income			-.0026 (-0.04)
asset value		-.1964*** (-4.20)	.1218 (0.60)
married		-1.756*** (-6.03)	-.0486 (-0.04)
not yet married			-7.987* (-1.82)
secondary education		-.7991*** (-3.84)	-.4962 (-0.65)
tertiary education		-.9643*** (-2.67)	-5.059*** (-3.72)
female			-1.479** (-2.08)
age			-1.1828*** (-4.22)
ill			-3.273*** (-2.74)
poor today		.4725*** (3.03)	
insured		-.7037*** (-3.23)	
crisis 1998		.0622 (0.39)	
rural			
government worker			
private worker			
selfemployed with permanent workers			
selfemployed with temporary workers			
<i>household shocks:</i>			
death of householder			
sickness of householder			
crop loss			
natural disaster		.8070** (1.86)	-5.823*** (-8.74)
business or job loss		.6963*** (2.46)	-4.956*** (-4.07)
decrease in income		.4816* (1.65)	2.234*** (2.88)
poor due to no opportunities		.1099 (0.14)	2.072 (0.98)
number of parents in the hh		.5463 (1.06)	4.169*** (5.27)
number of children in the hh		.1863 (0.45)	
<i>characteristics of hh coresiding</i>			
percentage primary education		-.4772** (-2.24)	-.0093 (-0.01)
<i>characteristics of hh non-coresiding</i>		-.0661 (-1.31)	
percentage primary education			
percentage secondary education		.6219* (1.86)	-2.9998* (-1.74)
percentage tertiary education		1.655*** (3.81)	
percentage out of province		3.418*** (4.19)	
percentage disabled		.5674* (1.78)	
positive net transfers from siblings 1993		-1.857 (-0.52)	
number of migrants 1993		.5502*** (8.83)	
Number of observations	.7473*** (89.01)	5029	5029

Source: Own calculations. T-statistic in parenthesis.

Note: Province Dummies were also included in regression 3, but are not reported here. These provinces are North Sumatra, West Sumatra, South Sumatra, Lampung, West Java, Central Java, Yogyakarta, East Java, Bali, West Nusa Tenggara, South Kalimantan and South Sulawesi. Left out province is Jakarta.

plaining and instrumenting for positive net transfers. Net transfers take the value of zero if the de facto net amount received was negative or zero. The instrument "positive net transfers from siblings in 1993" identifies regression equation 2. The coefficient of the number of non-coresiding household members is negative, however not significant in explaining net transfers received.<sup>29</sup> However, the effect of educated migrants on net transfers is positive, sizable and significant.

Interestingly a household receives lower transfers if the members have access to other sources of insurance. Having experienced the crisis of 1998 negatively is not a reason for receiving more transfers. This is not surprising since the crisis has been a covariate shock that hit almost all Indonesian households.<sup>30</sup> The subjective evaluation of a household's poverty is positively correlated with net remittances. The variable "poor" indicates whether a household assessed itself as poor or not. Several dummies for shocks possibly experienced by the household were included in the regression. If a household experienced the death or sickness of household members in the last years, it received significantly higher transfers. Furthermore a loss of crops though a drought or other event significantly drew more net remittances.<sup>31</sup> Therefore we can conclude that neediness is an important determinant of transfers. Transfers seem to insure the household, but do not automatically top up other insurance. On the other hand, having one's parents at home leads to significantly less transfers. Married individuals also get significantly lower transfers, as do well educated and wealthier individuals. The latter category of households is clearly less in need of transfers.

Additionally, the characteristics of migrants themselves are an important determinant of net transfers. Having more educated migrants outside the household increases the amount of transfers received. The higher the percentage of migrants living outside the province of the recipient the higher are positive net transfers re-

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<sup>29</sup> The negative sign indicates that household members living outside the household tend to be potential petitioners instead of potential insurers. This result is in line with our short-run perspective and is indicated by the descriptive statistics presented above. Extensive panel data would be needed for a long-run perspective, where the potential insurance effect of non-coresiding household members should also be found.

<sup>30</sup> The economic crisis took place in 1998. IFLS 3 data are not any more influenced by the crisis. It led to a drop of output by 15 percent in 1998 compared to the output level in 1997 and to inflation rates of 75-80 percent (Frankenberg et al., 1999).

<sup>31</sup> The cost of shocks is not significantly positive related to positive net transfers. Households that experienced shocks rarely specified the cost of shocks. Therefore it is questionable whether it is an adequate measure.

ceived. Both variables determine the success of migrants. Living out of province ensures that migrants and the household of origin are less likely hit by the same covariate shocks and therefore facilitates mutual insurance.

Turning to regression 3, the negative and significant effect of positive net transfers per capita on working hours of the head and his/her spouse is in line with the predicted disincentive effects. This effect is mitigated partly by the positive effect of non-coresiding household members if the household receives positive net transfers. Thus couples have to work in order to provide transfers to potential petitioners. The direct effect of positive net transfers on working hours is given by a semi-elasticity of a -0.63 working hours decrease given a one percentage increase in positive net remittances. However, the combined effect of educated migrants on positive net remittances and working hours has to be calculated to evaluate the effective size of the disincentive effect. The combined effect - the semi-elasticity of an increase in the percentage of educated migrants on working hours - is calculated as follows:

$$\begin{aligned}
 W_i &= \alpha_i + \beta_1 \mathbf{X}_i + \beta_2 \mathbf{Xc} + \beta_3 V_i + \beta_4 T_i \\
 &\quad + \beta_5 (P.M_{educated}^{-1} * M_{educated})_i \\
 &\quad + \varepsilon_i
 \end{aligned} \tag{4}$$

$$\begin{aligned}
 T_i &= \alpha_i + \gamma_1 \mathbf{X}_i + \gamma_2 \mathbf{Xnc}_i + \gamma_3 \mathbf{S}_i + \gamma_4 P.M_{educated,i} \\
 &\quad + \gamma_5 Z_i + \varepsilon_i
 \end{aligned} \tag{5}$$

$$\begin{aligned}
 \frac{\partial W}{\partial P.M_{educated}} * P.M_{educated} &= (-\beta_5 P.M_{educated}^{-2} * M_{educated} \\
 &\quad + \beta_4 * (\gamma_4)) \\
 &\quad * P.M_{educated}
 \end{aligned} \tag{6}$$

To determine the size of the effect, the model is estimated using the combined average percentage of educated migrants (79 percent in 2000) as independent variable in regression 2.<sup>32</sup> A one percent increase in educated migrants leads to a 0.48

<sup>32</sup> Coefficient of number of migrants  $\beta_5$ : 0.20 (5 percent significance level); coefficient of positive net transfers  $\beta_4$ : 0.70 (5 percent significance level); coefficient of percentage of educated migrants  $\gamma_4$ : 2.70 (1 percent significance level). The average number of educated migrants is 7.8.

hours decrease in working hours. One more migrant educated would mean an 13 percent increase in the percentage of educated migrants. This leads to a approximate reduction in working hours of 6 hours. The effective disincentive is as well significant.

The finding of disincentive effects can be put into question if there exists an unobserved component that is negatively related to working hours and positively to net transfers. In the analysis we saw that the needy receive relatively more positive net transfers.<sup>33</sup> It might be the case that the households that receive high positive net transfers are further disadvantaged in finding a full-time or regular formal employment. These household will be employed in informal jobs. Evidence shows that the informal sector is often characterized by irregular and excessive of working hours (Musiolek, 2002; Fluitman and Momo, 2001; ILO, 2000). Looking at the analysed sample, average normal working hours in the formal sector (19,6 hours per week) are found to be slightly higher than normal working hours in the informal sector (18 hours per week). Moreover, a subjective variable measuring whether the majority of individuals in a village or town holds the opinion that the poor stay poor due to no opportunities to overcome poverty, is included in the regression. The coefficient is negative but not significant in explaining the difference in normal working hours between individuals. Moreover, the province dummies included in the regression, left-out province being Jakarta, should capture regional disadvantages in finding a regular employment. Most of them are significantly negative meaning that in most provinces working hours are on average lower than in Jakarta.<sup>34</sup>

Normal hours of work are further explained using different employment categories. Excluded is the category of self-employed workers with no permanent or temporary workers. Private workers are those employed in the formal sector. This group and self-employed workers with temporary staff seem to work significantly more.

Moreover, a high non-labor income leads to less hours worked, but not significantly so. The wealth of the household has no influence. The marital status also seems to be unimportant in explaining normal hours worked per week. Married couples do not seem to work significantly less than divorced or widowed individuals. Not

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<sup>33</sup> The correlation between income per capita and positive net remittances per capita (concentrating on those households that receive amounts higher than zero) is positive but tiny (0.0003).

<sup>34</sup> The province dummies were not reported in the appendix.

yet married individuals however do work less hours. Tertiary education leads to fewer hours worked. This may be a sign of more regular working hours. The higher the percentage of other co-residing household members with completed primary education the lower are hours worked. The negative coefficient might indicate that working hours of the head and spouse are lower because the co-residing members work also. The other variables show the expected signs. Females work significantly less hours than males. Living in rural areas means working fewer hours. This may also be related to fewer opportunities in the farm and non-farm sector of the economy. Being ill and older significantly reduces hours worked.

To conclude, the size of the disincentive effect suggested at the individual level is sizeable as well. This leaves the question whether there are differing disincentive effects between sectors.

#### 4.5 Different Sectors

This section analyses whether there exist differences in behavioral effects of intra-family transfers between different sectors. So far the analysis has been ignoring that formal sector employees are less flexible in adjusting working hours.

The informal sector comprises self-employed persons working alone, with the help of temporary employers, or with no more than five permanent employers. Other definitions were tested without any difference in the empirical results. This definition is in line with the definitions and classifications provided in the United Nations System of National Accounts (Rev.4) and ILO informal sector surveys (ILO, 1999). When differentiating between the formal and informal sector, disincentive effects in the informal sector can be detected. Table 7 and 8 presents the results.<sup>35</sup> As expected, in the formal sector no clear evidence of a reduction in working hours due to a positive income shock in the past is found.

Differentiating between the agricultural and non-agricultural sector<sup>36</sup> no clear evidence of a disincentive can be found. Results are presented in tables 9 and 10. One can argue that the Dummy variable for positive net remittances gives

<sup>35</sup> The results for the subsample of head and spouse using three-stage least squared are found in appendix, tables 16 and 17. Note also that the regressions for the formal and agricultural sector using "first difference" are not reported in this study.

<sup>36</sup> Individuals were asked specifically in which sector of the economy they are working.

Table 7: First Differences - Normal Hours Worked per Week - Informal Sector

	(1)	(2)	(3)	(4)
1993-2000				
positive net transfers per capita	-2.158 (2.06)**			
Dummy for positive net transfers per capita		-6.618 (2.95)***	-1.874 (2.19)**	
net transfers per capita				-0.369 (3.00)***
rural				-18.483 (8.11)***
asset value per capita 1993	-12.896 (3.17)***	-18.548 (8.14)***	-17.261 (5.60)***	-0.163 (0.32)
non-labor income per capita 1993	-0.405 (0.46)	-0.086 (0.17)	-0.217 (0.29)	-0.291 (1.34)
age	-0.609 (1.69)*	-0.247 (1.13)	-0.102 (0.36)	-0.480 (4.99)***
female	-0.311 (2.09)**	-0.488 (5.09)***	-0.503 (4.15)***	-5.140 (1.50)
opportunities	-4.729 (0.92)	-5.668 (1.66)*	-5.112 (1.14)	8.616 (3.55)***
shock prior to 1993	6.793 (1.63)	8.756 (3.61)***	10.212 (3.14)***	-9.992 (2.13)**
percentage primary education	-11.784 (1.60)	-9.830 (2.09)**	-10.004 (1.65)*	44.510 (8.28)***
percentage secondary education	44.073 (4.87)***	44.548 (8.28)***	41.942 (5.88)***	67.446 (10.22)***
percentage tertiary education	60.238 (5.58)***	67.389 (10.21)***	63.680 (7.23)***	115.153 (4.82)***
normal working hours 1993	44.378 (0.81)	115.578 (4.84)***	136.043 (3.65)***	-0.659 (20.04)***
Constant	-0.680 (10.94)***	-0.658 (20.00)***	-0.661 (14.78)***	67.531 (8.09)***
Observations	80.715 (4.80)***	69.225 (8.28)***	84.114 (6.18)***	2463
R-squared	744	2463	1377	0.20
	0.20	0.20	0.20	
Source: Own calculations				
T-statistic in parenthesis				

Table 8: First Differences - Normal Hours Worked per Week - Formal Sector

	(1)	(2)	(3)	(4)
1993-2000				
positive net transfers per capita	-2.299 (1.77)*			
Dummy for positive net tf		-1.294 (0.48)		
positive gross transfers per capita			-3.955 (4.08)***	
net transfers per capita				0.004 (0.03)
rural	-5.824 (1.21)	-4.369 (1.73)*	-5.505 (1.59)	-4.478 (1.77)*
asset value per capita 1993	0.281 (0.28)	-1.205 (2.26)**	0.137 (0.17)	-1.183 (2.20)**
non-labor income per capita 1993	-0.071 (0.15)	-0.151 (0.63)	-0.052 (0.16)	-0.153 (0.64)
age	-0.335 (1.45)	-0.102 (0.74)	-0.285 (1.59)	-0.110 (0.80)
female	-9.331 (1.19)	-15.346 (3.03)***	-12.395 (1.90)*	-15.529 (3.06)***
opportunities	13.388 (2.38)**	10.423 (3.57)***	13.316 (3.17)***	10.379 (3.56)***
shock prior to 1993	-29.989 (1.76)*	-11.235 (1.16)	-12.038 (1.06)	-11.278 (1.17)
percentage primary education	42.220 (3.57)***	55.808 (8.48)***	48.310 (5.46)***	55.927 (8.50)***
percentage secondary education	52.723 (3.35)***	62.034 (7.42)***	57.729 (5.02)***	62.191 (7.44)***
percentage tertiary education	83.424 (1.35)	45.518 (1.61)	59.068 (1.49)	45.847 (1.62)
normal working hours 1993	-0.525 (6.71)***	-0.616 (16.25)***	-0.644 (12.18)***	-0.615 (16.22)***
Constant	65.588 (3.23)***	59.110 (6.42)***	85.761 (5.47)***	58.783 (6.40)***
Observations	457	1612	865	1612
R-squared	0.15	0.20	0.21	0.20
Source: Own calculations				
T-statistic in parenthesis				



an unbiased estimate of the disincentive effect. The disincentive effect in the non-agricultural sector is higher than the one in the agricultural sector. Furthermore, in appendix results are shown when using the three-stage least squares method on the individual-level sample of head and spouse of the household. Here, a disincentive effect can only be detected in the non-agricultural sector.

It can therefore be concluded that there indeed seem to exist disincentive effects for individuals of working-age. It is important to distinguish between sectors to detect the true behavioral effect of intra-family transfers.

## 5 Conclusion and Outlook

The empirical results can be interpreted twofold. At first sight, the concerns of development practitioners seem to be validated to some extent. Internal remittances or intra-family transfers seem not efficient in supporting household development strategies at the micro-level because of the negative incentive effects they cause.<sup>37</sup> The effective disincentive for household head and his/her spouse is rather significant in size. At the household level, the disincentive is significant, as well, meaning that resources are used to support other household members and these reduce effort.<sup>38</sup> The results for different sectors show that individuals of working age indeed react to the incentive to lower effort.<sup>39</sup>

There are potential positive effects of remittances. A household can use remittances to smooth household income. The empirical analysis found evidence for the insuring character of remittances. Therefore households might simply be in the position to substitute uncertain income earned in the informal sector with a more reliable income source. Additionally, households might substitute income earned under poor working conditions using remittances.

The household data of 2000 and 1993 from Indonesia give a picture of net providers of transfers and not so much net recipients. Household members, especially those

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<sup>37</sup> However, designing an alternative public transfer systems to be more incentive-compatible is no alternative since informational asymmetries are more serious.

<sup>38</sup> As long as child work, for example, is reduced through transfers, transfers are welfare enhancing and have no economically negative effect. Even if adult children living in the household significantly reduce working hours to spend more time in school or vocational education this would be deemed an economically desirable effect.

<sup>39</sup> There might also exist an effect on household composition, which has not been analyzed here.

Table 9: First Differences - Normal Hours Worked per Week - Non-agricultural Sector

	(1)	(2)	(3)	(4)
1993-2000				
positive net transfers per capita	-1.545 (0.91)			
Dummy for positive net tf		-6.997 (1.91)*	-1.923 (1.53)	
positive gross transfers per capita				-0.278 (1.50)
net transfers per capita				-1.081 (1.42)
asset value per capita 1993	0.156 (0.12)	-1.062 (1.41)	-0.446 (0.42)	-0.620 (1.98)**
non-labor income per capita 1993	-1.386 (2.28)**	-0.601 (1.92)*	-0.908 (2.08)**	-0.151 (0.85)
age	-0.222 (0.76)	-0.142 (0.80)	-0.082 (0.36)	-8.804 (1.66)*
female	-4.485 (0.54)	-8.915 (1.69)*	-13.162 (1.95)*	15.608 (3.97)***
opportunities	20.966 (2.88)***	15.678 (3.99)***	18.445 (3.32)***	0.835 (0.07)
shock prior to 1993	-0.655 (0.04)	1.399 (0.12)	2.887 (0.23)	39.063 (4.23)***
percentage primary education	45.888 (2.83)***	38.748 (4.20)***	32.658 (2.64)***	59.139 (6.24)***
percentage secondary education	43.318 (2.53)**	58.957 (6.23)***	47.107 (3.62)***	98.369 (3.71)***
percentage tertiary education	204.823 (3.16)***	97.557 (3.68)***	120.788 (3.13)***	-0.619 (12.39)***
normal working hours 1993	-0.450 (4.71)***	-0.618 (12.37)***	-0.605 (8.74)***	56.515 (4.19)***
Constant	42.995 (1.53)	58.479 (4.32)***	62.878 (2.94)***	1160
Observations	324	1160	616	0.17
R-squared	0.16	0.17	0.17	
Source: Own calculations				
T-statistic in parenthesis				

Table 10: First Differences - Normal Hours Worked per Week - Agricultural Sector

	(1)	(2)	(3)	(4)
1993-2000				
positive net transfers per capita	-1.044 (0.73)			
Dummy for positive net tf		-5.885 (1.87)*	-1.703 (1.40)	-0.321 (1.80)*
positive gross transfers per capita				-0.890 (1.06)
net transfers per capita				-0.451 (1.35)
asset value per capita 1993	-1.386 (1.08)	-0.812 (0.97)	-0.134 (0.12)	
non-labor income per capita 1993	-0.166 (0.33)	-0.417 (1.24)	0.024 (0.06)	
age	-0.375 (1.69)*	-0.515 (3.49)***	-0.576 (3.28)***	-0.511 (3.46)***
female	-6.743 (0.85)	-10.660 (1.85)*	-6.850 (0.95)	-10.119 (1.74)*
opportunities	9.438 (1.75)*	8.771 (2.57)**	9.465 (2.22)**	8.575 (2.52)**
shock prior to 1993	-13.028 (1.63)	-13.237 (2.32)**	-15.078 (2.17)**	-13.445 (2.36)**
percentage primary education	18.666 (1.46)	34.554 (4.07)***	23.130 (2.27)**	34.671 (4.09)***
percentage secondary education	29.360 (1.94)*	48.158 (4.93)***	39.345 (3.31)***	48.456 (4.97)***
percentage tertiary education	-35.387 (0.53)	120.486 (3.38)***	71.748 (1.29)	121.140 (3.40)***
normal working hours 1993	-0.554 (6.37)***	-0.598 (12.20)***	-0.579 (9.06)***	-0.599 (12.20)***
Constant	69.260 (3.01)***	61.119 (4.46)***	67.089 (3.52)***	59.877 (4.37)***
Observations	335	1008	586	1008
R-squared	0.16	0.17	0.17	0.17
Source: Own calculations				
T-statistic in parenthesis				

Note: Including the number of missing household members did not change regression outcomes.

migrating within their own country, are potential petitioners and not only insurers of their close relatives. Intra-family transfers in Indonesia form part of a mutual insurance system. The fact of being a potential petitioner and a potential insurer simultaneously leads to a compensation for the disincentive effects of transfers.

The analysis shows also that migration is an effective diversifying strategy for a household only if the migrants are educated. The fact that migration may not be crowned with success especially for the poor and uneducated is not new. Most of them end up in no better situation.

Furthermore, the empirical results may implicate that international remittances may cause even more severe disincentive effects. First, this is for the reason of missing mutuality. Second, the moral hazard problem is more pronounced. Furthermore, the analysis shows that richer households send more migrants. Only these can afford the high cost of migration. The cost of migrating abroad is even higher. This makes it unlikely that a significant amount of poor households working in subsistence agriculture can afford migration as a diversifying strategy. In this case, there could exist positive incentive effects.

Although comprehensive, this analysis misses some important aspects. Due to data shortages it was not possible to introduce a monetary measure of the disincentive. This would be necessary to quantify the amount of income that is lost and calculate whether the net effect on income is still positive.

Furthermore it would be interesting to be able to assess whether children spent more time in school if the household regularly receives remittances. Therefore time-use statistics would be needed to investigate other possible welfare-enhancing effects of remittances at the household level.

Table 11: Characteristics of Householders and Non-Coresiding (NC) Family Members, 1993

	Head of hh/Spouse	Children in the hh	Children nc	Siblings in the hh	Siblings nc	Parents in the hh	Parents nc
Average number per household	1.7	0	0	2	0	0	0,4
Percentage married	88	6	60	66	14	14	.
Percentage not yet married	2	92	38	10	1.4	1.4	.
Average Age	43	12	12.5	39	67	67	38
Percentage with primary education	51	42	47	41	23	23	34
secondary education	24	25	36	19	2	2	6
tertiary education	4	2	7	3	1	1	0
Females as a percentage of nc			53	49			46
Percentage out of province			27	17			17
Percentage working	65	8	52	58	3	3	46
Mean working hours per week j1	42	42	49		34		
Mean working hours per week j2	27	18	16		25		

Source: Own Calculations.

Note: Columns 3 to 8 sort the relatives of couples according to place of residence. nc=non-coresiding, hh=household.

Table 12: Transfer activities and flows 1993 PPP USD

received and/or given to	All	Children	Siblings	Parents
Percentage of households who:				
receive or give transfers	78	29	50.5	50
receive transfers only	14	11	14	6
both receive and give transfers	39.5	8.5	20	15
give transfers only	25	9	17	29
on balance receive net transfers	20.5	16	22	11
on balance give net transfers	30	13	27	37
on balance receive/give zero				
Transfer flows:				
Mean net transfers received	-252	-38	-46	-145
Mean per capita household income	1206			
Mean per capita household asset value	8063			
Median net transfers received	0	0	0	0
Median per capita household income	361			
Median per capita household asset value	2209			
Net transfers:				
Percentage of households with positive net receipts	20.5	16	22	11
Median amount received	99	108	51	69
Mean amount received	805	637	654	593
Median percentage of income	8	11	4	5
Mean percentage of income	19	24	11	12
Percentage receiving less than 10 percent of income	32	25	48	47
Percentage receiving more than 50 percent of income	20	22	12	13
Percentage of households with negative net receipts	30	13	27	37
Median amount given	145	271	63	90
Mean amount given	1141	1341	680	572
Median percentage of income	7	12	3	4
Mean percentage of income	15	21	8	10
Percentage giving less than 10 percent of income	39	23	53	51
Percentage giving more than 50 percent of income	14	20	9	8
Source: Own calculations				

Note: The category "All" includes all households with non-coresiding children, sibling and parents (relatives of head or spouse). Children, siblings and parents are non-coresiding relatives of head or spouse. The categories "Children", "Siblings" and "Parents" include only those households with children, siblings or parents non-coresiding.

Table 13: Variable Definitions - Chapter 3

normal hours of work	weekly normal working hours in the past 12 month
number of migrants	Number of household members (children, siblings, parents) living outside couple's household
positive net transfers	In of positive net transfers per capita, zero if negative or zero net transfers
income	total household income per capita, household level
non-labor income	In of non-labor income per capita, household level
asset value	In of asset value per capita, household level
married	Dummy, 0 not married, 1 married
not yet married	Dummy, 0 married, widow/er, divorced, 1 not yet married
secondary education	Dummy, highest level of education attended was secondary schooling
tertiary education	Dummy, highest level of education attended was tertiary schooling
female	Dummy, 0 male, 1 female
age	Age in IFLS3
ill	Dummy, 1 serious health problems in the last 12 month
poor today	Dummy, 1 household indicated to be on the lowest two steps of six-step ladder, 1 poorest - 6 richest
insured	Dummy, 1 head of household/ spouse is holder of health/labor/private/life insurance
crisis 1998	Dummy, 1 crisis of 1998 had negative consequences for the household
rural	Dummy, 1 rural, 0 urban
government worker	Dummy, 1 if primary employment category was government
private worker	Dummy 1 if primary employment category was formal market
selfemployed with permanent workers	Dummy 1 if primary employment category was selfemployment with permanent workers
selfemployed with temporary workers	Dummy 1 if primary employment category was selfemployment with temporary workers
<i>household shocks:</i>	
death of householder	Dummy, 1 if death of householder occurred in the last 12 month
sickness of householder	Dummy, 1 if sickness of householder occurred in the last 12 month
crop loss	Dummy, 1 if crop loss occurred in the last 12 month
natural disaster	Dummy, 1 if natural disaster affected the household in the last 12 month
business or job loss	Dummy, 1 if business or job loss occurred in the last 12 month
decrease in income	Dummy, 1 if decrease in household income occurred in the last 12 month
cost of shocks	Cost of shock, household level
poor due to no opportunities	Dummy, poor in the village of the household are poor due to no opportunities
number of parents in the hh	
number of children in the hh	
<i>characteristics of hh coresiding</i>	
percentage primary education	percentage of household members with primary education
percentage secondary education children	percentage of household members with secondary education
percentage tertiary education parents	percentage of household members with tertiary education
<i>characteristics of hh non-coresiding</i>	
percentage primary education	percentage of migrants with primary education
percentage secondary education	percentage of migrants with secondary education
percentage tertiary education	percentage of migrants with primary education
percentage out of province	percentage of migrants living out of province where couple's household is located
percentage disabled	percentage of migrants disabled
positive net transfers 1993	In of positive net transfers survey 1993 per capita
number of migrants 1993	Number of migrant children survey 1993

Table 14: Descriptive Statistics of Explanatory Variables - Fixed Effects Model - Household

Variable	Mean	Standard Deviation	Min	Max
rural	0.573	0.495	0	1
ln asset value per capita 1993	13.572	2.159	0	19.70
ln non-labor income per capita 1993	3.573	4.954	0	15.38
age of head in the household 1993	41.365	11.019	17	86
female	0.092	0.288	0	1
opportunities 1993	0.776	0.417	0	1
shock prior to 1993	0.036	0.187	0	1
percentage of hh members 1993 with primary education	0.202	0.195	0	0.83
secondary education	0.103	0.165	0	0.80
tertiary education	0.006	0.043	0	0.60

Source: Own calculations.

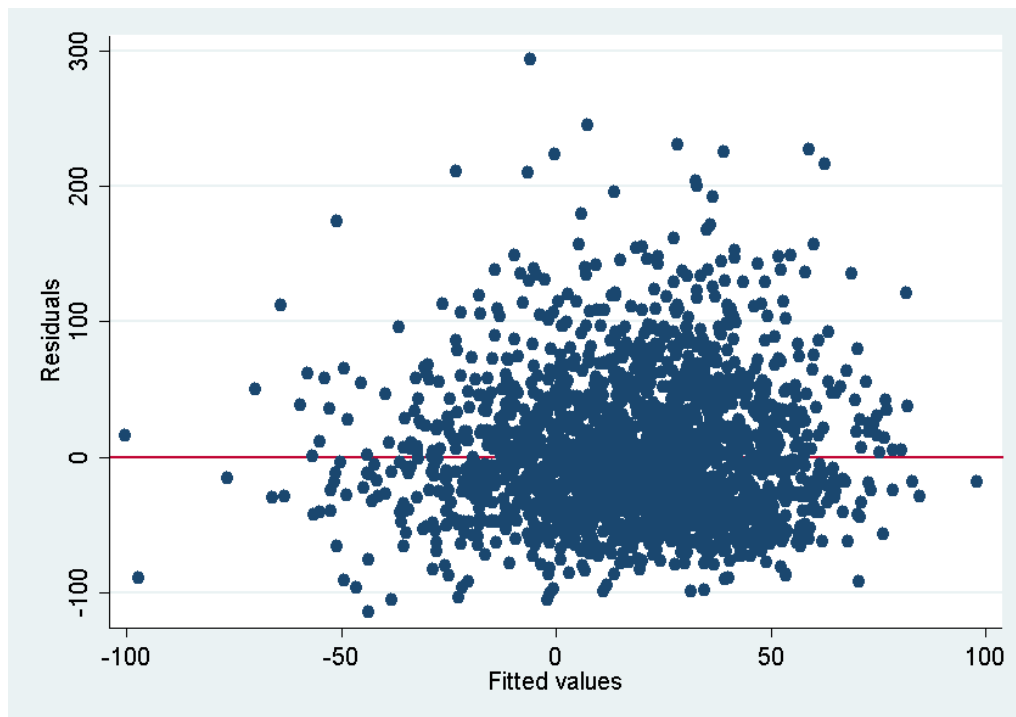


Figure 2: Residual Plot 1: First Differences - Normal Hours Worked per Week



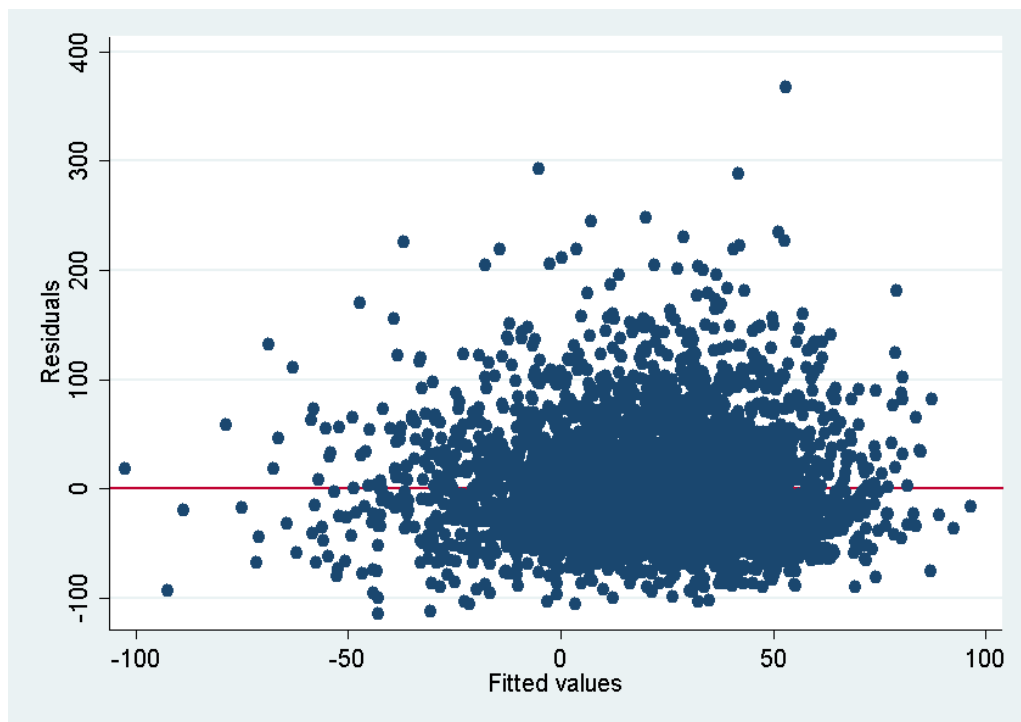


Figure 3: Residual Plot 2: First Differences - Normal Hours Worked per Week

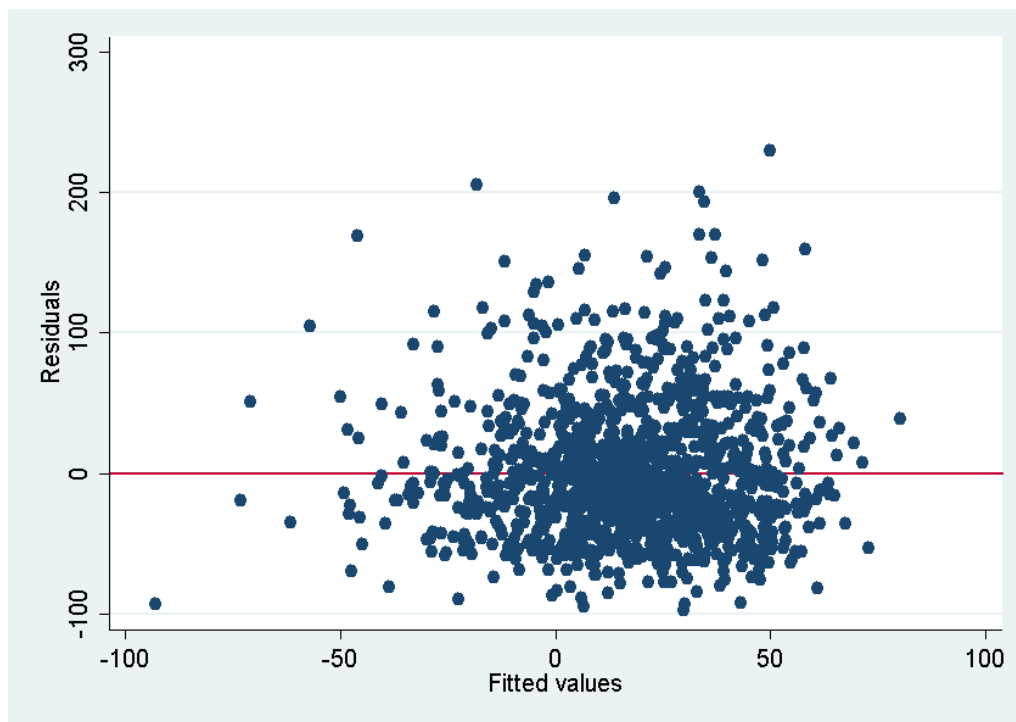


Figure 4: Residual Plot 3: First Differences - Normal Hours Worked per Week

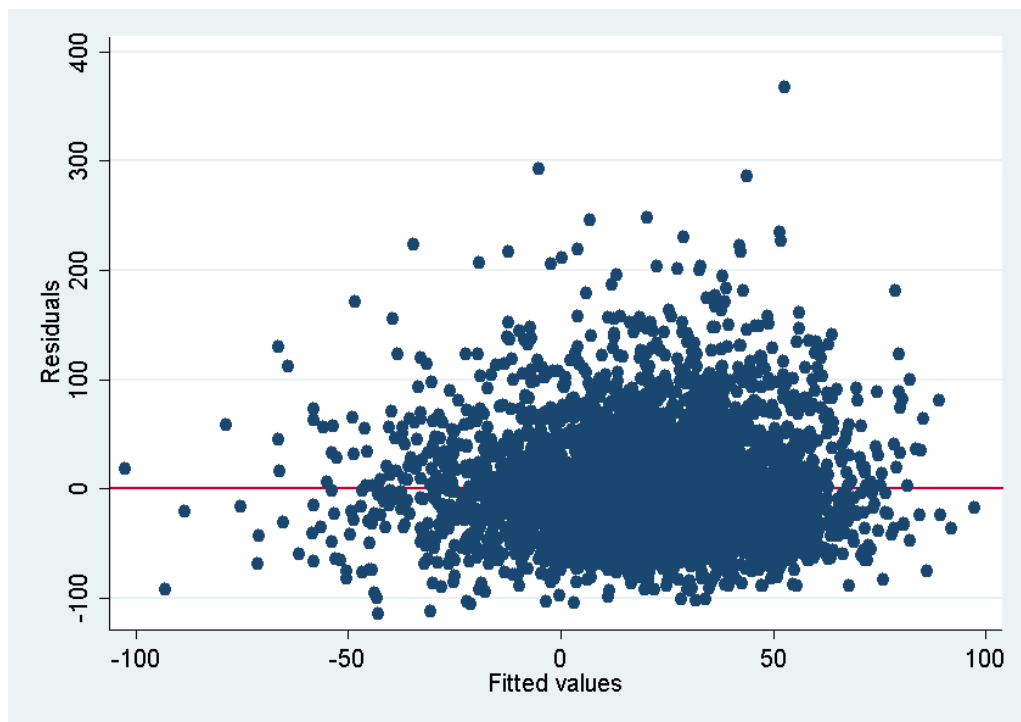


Figure 5: Residual Plot 4: First Differences - Normal Hours Worked per Week

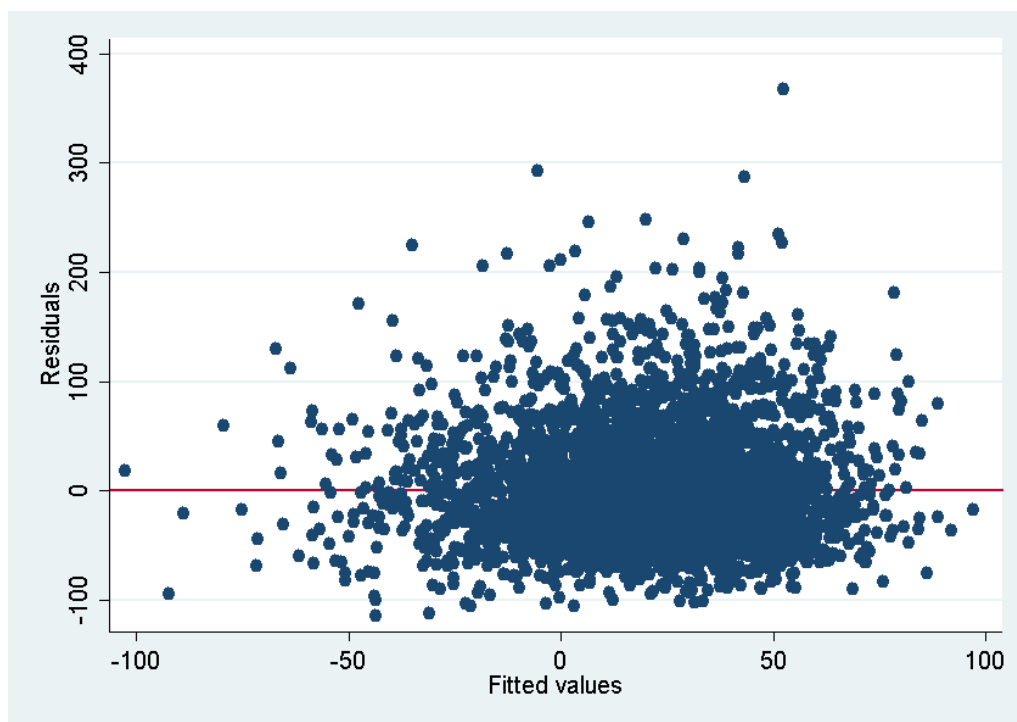


Figure 6: Residual Plot 5: First Differences - Normal Hours Worked per Week

Table 15: Ordinary Least Squares Regressions

1999/2000	(1)	(2)	(3)
	Migrants	Positive Net Transfers	Normal Working Hours
non-labor income			.0022 (0.04)
asset value		-.2023*** (-4.32)	.2650 (1.43)
household income	.1189*** (4.86)		
married		-1.604*** (-6.08)	1.783 (1.57)
not yet married			-7.970** (-1.83)
secondary education		-.8185*** (-3.92)	-.1216 (-0.16)
tertiary education		-.9438*** (-2.60)	-4.623*** (-3.42)
female			-1.754*** (-2.62)
age	-.0629*** (-15.24)		-.2108*** (-5.80)
ill			-3.414*** (-2.86)
poor today		.4089*** (2.61)	
insured		-.7368*** (-3.36)	
crisis 1998		.0946 (0.58)	
rural			-5.790*** (-8.66)
government worker			-4.578*** (-3.91)
private worker			2.205*** (2.84)
selfemployed with permanent workers			2.308 (1.11)
selfemployed with temporary workers			4.243*** (5.44)
<i>household shocks:</i>			
death of householder		.7837* (1.79)	
sickness of householder		.6677*** (2.33)	
crop loss		.3790 (1.29)	
natural disaster		.1389 (0.17)	
business or job loss		.5599 (1.07)	
decrease in income		.1775 (0.42)	
cost of shocks		0.012 (0.37)	
poor due to no opportunities			-.0397 (-0.06)
number of parents in the hh		-.5197*** (-2.49)	
number of children in the hh		-.0619 (-1.23)	
<i>characteristics of hh co-residing</i>			
percentage primary education			-2.743 (-1.60)
<i>characteristics of hh non-co-residing</i>			
percentage primary education		.5647* (1.69)	
percentage secondary education		1.734*** (4.13)	
percentage tertiary education		3.291*** (4.05)	
percentage out of province		.5706* (1.78)	
percentage disabled		-1.630 (-0.45)	
positive net transfers from siblings 1993		.5506*** (8.79)	
number of migrants 1993	.7258*** (87.19)		
Number of observations	5029	5029	5029
Adjusted R-Squared	0,63	0,044	0,058

Source: Own calculations. T-statistic in parenthesis. Note: \*0.1, \*\*0.05, \*\*\*0.01 Significance level.

Note: Province Dummies were also included in regression 3, but are not reported here. These provinces are North Sumatra, West Sumatra, South Sumatra, Lampung, West Java, Central Java, Yogyakarta, East Java, Bali, West Nusa Tenggara, South Kalimantan and South Sulawesi. Left-out province is Jakarta.

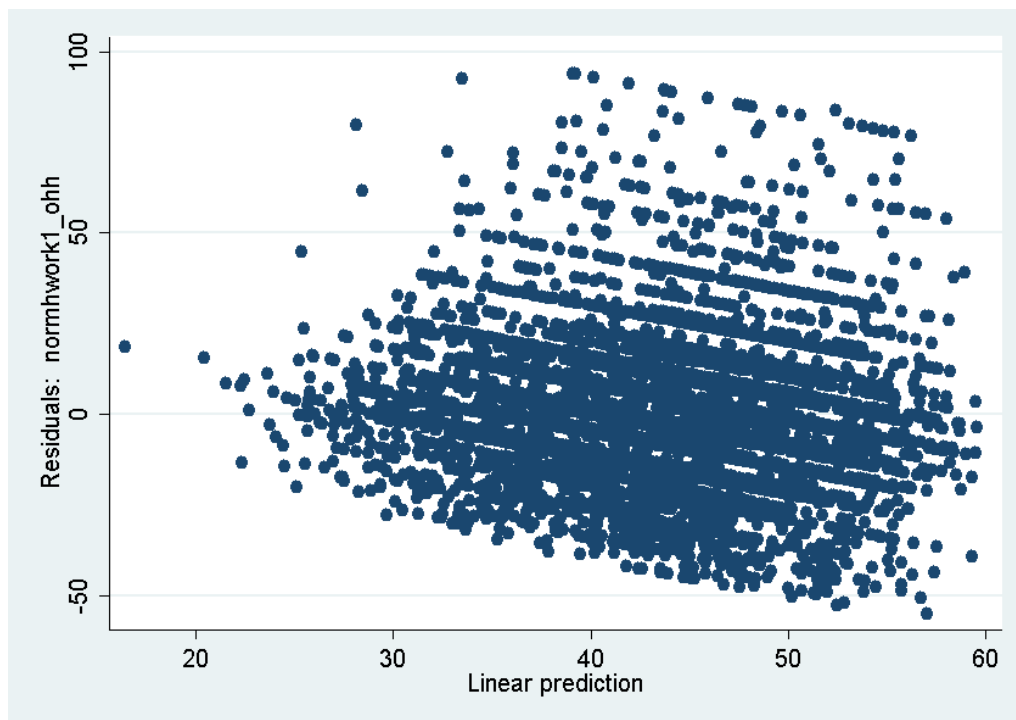


Figure 7: Residual Plot of the Transfer Regression

Table 16: Three-Stage Least Squares Regression - Informal Sector: Incentive effect on working hours of head/spouse

1999/2000	(1)	(2)	(3)
	Migrants	Positive Net Transfers	Normal Working Hours
Number of migrants		-0.015 (-0.42)	0.008 (1.81)
positive net transfers			-0.022 (-2.08)
non-labor income			-0.002 (-0.61)
asset value		-0.267 (-4.25)	0.003 (0.44)
household income	0.136(4.29)		
married		-2.298 (-6.35)	0.015 (0.30)
not yet married			-0.168 (-0.82)
secondary education		-0.433 (-1.59)	-0.053 (-1.65)
tertiary education		-0.815 (-1.11)	-0.034 (-0.40)
female			-0.040 (-1.41)
age	-0.065 (-12.24)		-0.006 (-3.58)
ill			-0.063 (-1.34)
poor today		0.321 (1.61)	
insured		0.008 (0.02)	
crisis 1998		0.0477 (0.22)	
rural			-0.143 (-5.04)
selfemployed with temporary workers			0.110 (4.45)
<i>household shocks:</i>			
death of householder		0.810 (1.45)	
sickness of householder		0.729 (1.70)	
crop loss		0.425 (0.78)	
natural disaster		-0.869 (-0.83)	
business or job loss		0.336 (0.40)	
decrease in income		-0.218 (-0.36)	
cost of shocks		0.016 (0.38)	
poor due to no opportunities			0.003 (0.09)
number of parents in the hh		-0.666 (-2.26)	
number of children in the hh		-0.105 (-1.64)	
<i>characteristics of hh coresiding</i>			
percentage primary education			-0.020 (-0.27)
percentage secondary education			0.138 (1.93)
percentage tertiary education			0.143 (0.77)
<i>characteristics of hh non-coresiding</i>			
percentage primary education		0.902 (2.18)	
percentage secondary education		1.962 (3.58)	
percentage tertiary education		5.652 (4.34)	
percentage out of province		0.222 (0.52)	
percentage disabled		1.720 (0.40)	
positive net transfers from siblings 1993		0.755 (8.58)	
number of migrants 1993	0.707 (62.97)		
Number of observations	2902		
Source: Own calculations			

T-statistic in parenthesis.

Note: Province Dummies were also included in regression 3, but are not reported here.

Table 17: Three-Stage Least Squares Regression - Non-Agricultural Sector: Incentive effect on working hours of head/spouse

1999/2000	(1)	(2)	(3)
	Migrants	Positive Net Transfers	Normal Working Hours
Number of migrants		-0.018 (-0.37)	0.002 (0.38)
positive net transfers			-0.042 (-2.56)
non-labor income			0.002 (0.54)
asset value		-0.340 (-4.64)	-0.028 (-2.31)
household income	0.234(4.67)		
married		-1.611 (-3.33)	-0.065 (-1.07)
not yet married			-0.058 (-0.26)
secondary education		-0.700 (-1.92)	-0.049 (-1.22)
tertiary education		-0.689 (-1.25)	-0.174 (-2.85)
female			-0.124 (-3.35)
age	-0.068 (-8.10)		-0.006 (-2.31)
ill			-0.057 (-0.90)
poor today		0.318 (1.14)	
insured		-0.508 (-1.45)	
crisis 1998		0.115 (0.41)	
rural			-0.083 (-2.36)
government worker			-0.007 (-0.13)
private worker			0.137 (3.31)
selfemployed with permanent workers			0.195 (1.91)
selfemployed with temporary workers			0.310 (7.03)
<i>household shocks:</i>			
death of householder		0.764 (1.00)	
sickness of householder		0.224 (0.42)	
crop loss		-0.069 (-0.07)	
natural disaster		1.874 (1.06)	
business or job loss		0.660 (0.63)	
decrease in income		-0.594 (-0.58)	
cost of shocks		0.100 (1.68)	
poor due to no opportunities			-0.066 (-1.76)
number of parents in the hh		-0.689 (-1.25)	
number of children in the hh		0.109 (1.20)	
<i>characteristics of hh co-residing</i>			
percentage primary education			0.034 (0.34)
percentage secondary education			0.145 (1.59)
percentage tertiary education			0.483 (2.83)
<i>characteristics of hh non-co-residing</i>			
percentage primary education		0.694 (1.10)	
percentage secondary education		2.138 (2.82)	
percentage tertiary education		2.494 (2.07)	
percentage out of province		-0.397 (-0.78)	
percentage disabled		8.426 (1.36)	
positive net transfers from siblings 1993		0.373 (3.65)	
number of migrants 1993	0.700 (44.89)		
Number of observations	1643		
Source: Own calculations			

T-statistic in parenthesis.

Note: Province Dummies were also included in regression 3, but are not reported here.



Table 18: Three-Stage Least Squares Regression - Agricultural Sector: Incentive effect on working hours of head/spouse

1999/2000	(1)	(2)	(3)
	Migrants	Positive Net Transfers	Normal Working Hours
Number of migrants		-0.011 (-0.17)	0.006 (0.93)
positive net transfers			-0.001 (-0.08)
non-labor income			-0.004 (-0.87)
asset value		-0.063 (-0.57)	-0.026 (-2.02)
household income	0.085(1.99)		
married		-1.977 (-3.23)	0.061 (0.87)
not yet married			.
secondary education		-1.137 (-2.13)	-0.052 (-1.02)
tertiary education		-1.111 (-0.72)	-0.085 (-0.57)
female			-0.172 (-3.65)
age	-0.043 (-4.43)		-0.003 (-1.07)
ill			-0.105 (-1.49)
poor today		0.472 (1.36)	
insured		-1.020 (-1.41)	
crisis 1998		0.201 (0.53)	
<i>household shocks:</i>			
death of householder		0.143 (0.17)	
sickness of householder		1.009 (1.36)	
crop loss		0.845 (0.94)	
natural disaster		-1.517 (-0.58)	
business or job loss		2.662 (1.51)	
decrease in income		0.055 (0.06)	
cost of shocks		-0.069 (-0.94)	
poor due to no opportunities			-0.028 (-0.65)
number of parents in the hh		-1.067 (-1.82)	
number of children in the hh		-0.317 (-3.03)	
<i>characteristics of hh coresiding</i>			
percentage primary education			-0.120 (-1.26)
percentage secondary education			0.096 (0.87)
percentage tertiary education			-0.900 (-1.73)
<i>characteristics of hh non-coresiding</i>			
percentage primary education		-0.132 (-0.20)	
percentage secondary education		2.007 (1.94)	
percentage tertiary education		-0.364 (-0.13)	
percentage out of province		0.326 (0.42)	
percentage disabled		-10.142 (-1.49)	
positive net transfers from siblings 1993		0.823 (4.82)	
number of migrants 1993	0.701 (38.07)		
Number of observations	840		
Source: Own calculations			

T-statistic in parenthesis.

Note: Province Dummies were also included in regression 3, but are not reported here.

Table 19: Three-Stage Least Squares Regression - Formal Sector: Incentive effect on working hours of head/spouse

1999/2000	(1)	(2)	(3)
	Migrants	Positive Net Transfers	Normal Working Hours
Number of migrants		0.008 (0.22)	0.002 (0.49)
positive net transfers			-0.007 (-0.55)
non-labor income			-0.003 (-1.37)
asset value		-0.111 (-1.59)	-0.004 (-0.58)
household income	0.094(2.44)		
married		-0.899 (-1.82)	-0.038 (-0.78)
not yet married			-0.214 (-1.57)
secondary education		-1.230 (-3.74)	0.017 (0.60)
tertiary education		-1.182 (-2.57)	-0.113 (-2.87)
female			-0.176 (-6.81)
age	-0.062 (-9.27)		-0.005 (-3.60)
ill			-0.098 (-2.22)
poor today		0.588 (2.33)	
insured		-0.642 (-2.35)	
crisis 1998		0.073 (0.29)	
rural			-0.082 (-3.57)
government worker			4.118 (28.43)
private worker			4.216 (30.33)
selfemployed with permanent workers			4.200 (27.88)
selfemployed with temporary workers			.
<i>household shocks:</i>			
death of householder		0.991 (1.35)	
sickness of householder		0.620 (1.29)	
crop loss		0.381 (0.46)	
natural disaster		2.246 (1.47)	
business or job loss		0.687 (0.78)	
decrease in income		1.048 (1.16)	
cost of shocks		-0.004 (-0.07)	
poor due to no opportunities			-0.025 (-0.92)
number of parents in the hh		-0.003 (-0.04)	
number of children in the hh		-0.147 (-0.48)	
<i>characteristics of hh coresiding</i>			
percentage primary education			-0.007 (-0.10)
percentage secondary education			-0.021 (-0.33)
percentage tertiary education			0.235 (1.86)
<i>characteristics of hh non-coresiding</i>			
percentage primary education		-0.092 (-0.16)	
percentage secondary education		0.660 (0.92)	
percentage tertiary education		1.480 (1.35)	
percentage out of province		1.030 (2.17)	
percentage disabled		-7.552 (-1.16)	
positive net transfers from siblings 1993		0.373 (4.25)	
number of migrants 1993	0.746 (60.07)		
Number of observations	2122		
Source: Own calculations			
T-statistic in parenthesis.			

Note: Province Dummies were also included in regression 3, but are not reported here.

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