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A Simultaneous Determination of the Inter Vivos Transfer and the Unemployment Duration: the Malian case

Fousseynou BAH*

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Abstract

This article aims to establish a link between the unemployment duration and the inter vivos transfers received by the unemployed individuals. We present a model where the transfer shapes the receiver's job search strategy while the donor bases it on the receiver's unemployment duration. Ultimately, a recursion arises and leads to a simultaneous determination of the transfer and the duration. The model aims to apprehend the job search behaviour in a context where the unemployment compensation system is weak or absent, like in some developing countries. We will take Mali as a study case.

Keywords : unemployment; inter-vivos transfer; job search; household economics.

JEL Classification : D1; D64; J64;

*Ph.D candidate at the Grenoble Economic Research Centre (*Centre de Recherche en Economie de Grenoble - CREG*) - University of Grenoble. E-mail: Fousseynou.Bah@etu.upmf-grenoble.fr

1 Introduction

In the absence of a government distributed unemployment compensation, the role played by the inter vivos transfers (transfers between living people) in the job search behaviour of an unemployed individual increases. The other variables presiding at his decision regarding the job opportunities, mainly the wage distribution and the job arrival rate, may matter, but they remain exterior while the transfer is the product of complex interactions between the searcher and his household environment. The impact of this environment goes beyond the transfer that only translates its quantitative aspect. It also shapes the searcher's preferences regarding the nature of the targeted job(s) and the working conditions, as suggested by Sussman (1965) who asserts that parents' aid to their children influences their occupational choices and their mobility, or by Schwartz (1967) who argues that gifts (that transfer can also embody) carry along an identity that the benefactor imposes and that the beneficiary accepts. Without the state interfering, the role of the household in the recipient's choices is exacerbated. In developing countries, like Mali, where the unemployment compensation system has yet to be developed, the household is at the heart of the job search strategies. This article aims to introduce a model that shows its role in the searcher's preferences and the duration of his unemployment spell.

Though the literature counts works linking agents' choices on the labour market to the household environment, unemployment and inter vivos transfers hardly find themselves related. The focus has mainly gone to either bequests or working recipients. Holtz-Eakin et al. (1993), for instance, show a negative relationship between inheritance, on one hand, and the labour force participation and labour supply of potential beneficiaries, on the other. Bernheim et al. (1985) found that the bequests are used by the parent as a way to influence the child's behaviour, to obtain his attention and companionship; they show that the contact between the two increases with the estate of the former. Cox and Rank (1992), based on a data set (National Survey of Families and Households), studies the same relationship, but between living people; they concluded that the transfer is positively related to the income of both the parent and the child. However, the probability of the transfer occurring is negatively related to the child's income. Chami (1998) elaborated a model in which the parent cares about the child's effort on the market. That effort that is also a merit good affects positively the parent's utility and constitutes a disutility for the child's.

Our study, though aiming to be in line with the previous by dealing with the impact of inter vivos transfers on the labour choices, differs by being specific to the unemployed recipients. Our model does not particularly aim to show what motive prevails because it will feature them both. They can both be identified in African households through the logics underlying the transfers to the unemployed recipients. First, there is an insurance logic: the contribution ones make to support the household while employed insures them a substitution income during inactivity or unemployment periods, allowing them to conserve a constant or acceptable living standard. It entitles them an access to the common goods (housing, food, healthcare if needed, etc.). Then, there is an assistance logic that translates a right for the less fortunate to be taken care of. It does not so much require a prior contribution as it depends on the beneficiary belonging

in the community of the benefactors (country, village or family). The two logics respectively translate exchange and altruism in the household dynamics. They also make the transfer in the direction of the unemployed household members a solid substitute for the unemployment benefits, especially when an institutionalized form of those benefits is absent. It can therefore replace the benefits in the same terms as featured in the job search models inspired by the seminal works of Stigler (1961, 1962), Mortensen (1970) or Lippman and McCall (1976).

In Mali, as generally in Africa, the social construction puts the family at the centre of the redistribution process that relies on those logics. Generally, families grow with extensions remaining attached to the core: it is common for sons to marry and to stay in the parental home, while the daughters that marry move into other familial homes. This results in a community of mutualisation. Though the Malian society shows signs of modernization, the extensive form of family remains dominant. The institutional backwardness seems to be the obvious cause; people rely on their family because the structures to turn to are not developed¹. 81% of the unemployed respondents of a 2007 household survey (DOEF, 2008) declared to be supported by their family; in a 2004 household survey (DOEF, 2004), that share was 79%. In informal interactions such as transfers, the line between the insurance and the assistance appears blurry, just as much as it is between exchange and altruism. Our model will attempt to capture them both.

In the section 2, we present a time-contingent model that relates the level of the transfer to the duration of the recipient's unemployment spell. We specify the utility functions of both of the protagonists: the donor's function will show the presence of both of the motives whereas the recipient's function will integrate the job search model. An equations system arises from the two functions, translating the strategic game that takes place between the two individuals. Section 3 presents the data and explores the descriptive statistics on the surveyed population. In the section 4, we comment the results of the instrumented regression and conclude with the section 5.

2 The framework

2.1 A time-contingent transfer model

It makes no doubt that unemployment is a major event in a person's life and that it leads to changes². The nature and the impact of these changes, however, depend on the prior rules shaping the person's environment. Therefore, the assumptions that are made on those rules determine the behaviour of an unemployed individual. In the African family case, the community life establishes

¹Points of view may diverge on the cause. Stark (1995), for instance, suggests that the family predominance in the redistribution process in developing countries is not due to an institutional backwardness, but, on the contrary, explains it. It is because the family transfers are efficient that the market institutions fail to emerge.

²In the literature, the impact of changes is neglected, as noted by Bhaumik (2001). His critic of previous empirical studies in the literature, such as the ones by Cox (1987) or Altonji et al. (1992), pointed out how they entirely attached the transfers to the incomes of individuals, neglecting the events in the recipient's life when those events (child birth, marriage, divorce, death, etc.) are decisive for the nature and the amount of the transfers.

reciprocity as a foundation of the interactions. With the rights, come along duties. That reciprocity does not alienate the affections that link the household members, the household being more or less a family. We introduce a model that allows reciprocity as a part of intergenerational transfers while relating the transfer to the exterior environment, that is to say the donor's opinion of the beneficiary's effort to create the conditions for a payback. Unemployment being a disturbing circumstance in the scheme, the donor's gesture in the present depends on his opinion as to whether or not the beneficiary will be able to integrate the solidarity chain.

Consider two agents, the donor (say the parent), i , and the recipient, j (the unemployed child). We write the additively separable utility function of the donor:

$$U_i = U_i(C_i) + t^{-\mu} \beta U_j(C_j) \quad (1)$$

The budget constraint is $C_i = Y_i - T$, C_i and Y_i being respectively the donor's consumption and income and T , the transfer. The impact of the recipient's utility i is weighted by two parameters: β ($0 \leq \beta \leq 1$), the level of altruism on i 's part, and $t^{-\mu}$, the impact of time of the donor's sensitivity to the recipient's consumption. While t is the duration of the transfer, taken on some regular basis (weekly, monthly, annually, etc), μ depends on i 's subjective appreciation of the environment. It primarily depends on the recipient's position in the intergenerational chain, which informs the donor on his capacity (or his likelihood) to reimburse the transfer. Its level cannot be the same for children, who fit the recipient stage, as for young adults, who enter the middle stage, or as for more mature people, who are closer the retirement stage. Since the focus of our study is going to be on the young adults (45.63% of the unemployed respondents are or less than 25 years old while 62.86% are under 30), we can say that the transfers can be consider as an abnormal extension of the first stage. Every period of outgoing transfer towards an unemployed recipient furthers the donor from the likelihood of receiving back as much as transferred (unless the recipient's future incomes turn out to be high enough to compensate the cut on the payback period). The longer it takes the donor to have a job, the longer the donor will have to wait before the repayment starts and the lesser the periods of reimbursement. The donor can only adjust by increasing the "family interest rate" specific to the recipient. Consequently, the duration affects the arbitration in disfavour of the transfer. The sign of μ is therefore negative. Its determinants can also include parameters regarding the immediate economic context; the donor can take into account the economic climate and lessen the impact of time on the transfer. The maximization of the donor's programme under the budget constraint gives:

$$\frac{U_i^c}{U_j^c} = \frac{\beta}{t^\mu} \quad (2)$$

There are two advantages to introducing time. First, it results in dissociating between β , that translates the donor's affection towards the recipient, and the transfer, that, so far, materialized this altruism. The transfer can vary with β remaining constant. It reacts inversely to the unemployment duration, the lengthening of which causes a decrease of the right-hand term of the equation. The left hand must follow with the recipient marginal utility increasing,

therefore his consumption decreasing, or/and by the donor's marginal utility decreasing, therefore his consumption increasing. Second, it alleviates the moral hazard problem that arises in this configuration. The time-contingency of the transfer deters the recipient from lengthening (needlessly) the unemployment duration³. The duration, by relating the level (and maybe the nature) of the transfer to the labour market conditions as experienced or/and processed by the recipient, provides the donor with a means to bring the recipient to behave responsibly. Our donor, in that regard, fits the Sussman (1953) description of parents who, though they do not hesitate to help their children, except responsible behaviour from them.

Now, we write the function of the recipient:

$$U_j = U_j(C_j) + t^{-\phi}U_j(e) \quad (3)$$

C_j is the recipient's consumption, e , the level of effort expanded in the job search and $t^{-\phi}$, the impact of time on the search disutility. The disutility is an increasing and differentiable function. As in the donor's function, t is the duration on a stable basis and ϕ , the reaction of the disutility to the duration of the job search. If, during the job search, the recipient's skills at exploring the market, identifying job opportunities and applying at them increase, then the marginal disutility is bound to decrease and the sign of the parameter, to be negative. We embrace that configuration because it supposes an agent that *learns by doing* and familiarizes with a market that might nevertheless be subjected to changes.

The recipient too has a budget, $C_j \leq T + w_r$, that conditions the maximization of his utility. This constraint is particular. We exclude any exogenous income, the inclusion of which would assume the ownership of an estate or assets by the recipient, which, in its turn, might make the transfer needless. As for the reservation wage, w_r , primarily dependant on the individual's characteristics (age, education, skills, etc.), its relationship with the effort is ambiguous. The effort might lead to its occurrence in the constraint, just like the failure to do so may lead the recipient to reconsider the level of the wage or of the effort, but the reaction, w_r^e , is not systematic. The impact of the effort on the wage is integrated to the latter's relationship with the duration ($w_r^e = w_t^e$), since the adjustments the recipient may proceed to happen over the course of the unemployment. The derivation of the Lagrangian function, $U_j(C_j) + t^{-\phi}U_j(e) - \lambda(C_j - T - w_r)$, gives the equality:

$$w_r^e = \frac{-U_j^e}{t^\phi U_j^c} \quad (4)$$

The reservation wage obeys the same logic as in its usual representation in which it equalizes the marginal utility of consumption to the marginal disutility of the job search pursuit. If we consider that the latter from the utility

³The moral hazard remains somehow because the recipient can still conceal the status changes, a job obtainment or the related income, that might occur in order to keep receiving the transfers. The donor can adjust by taking into account the work effort that is translated into the recipient's income. Since that scenario and ours mutually exclude each other - the recipient either has a job or is seeking for one -, we do not need to integrate the strategy parameters of such configuration.

expected from the futur employment, then the logic remains here.

With the two maximizations, we obtain two points of view on the same interaction, therefore, an equations system.

$$\begin{cases} U_j^c = \frac{t^\mu U_i^c}{\beta} \\ -U_j^e = w_r^e t^\phi U_j^c \end{cases} \quad (5)$$

Given that the recipient's consumption is financed (exclusively) by the transfer, we can deduce the derivate of his utility function in the first equation and insert it in the second:

$$\begin{cases} U_j^c = \frac{t^\mu U_i^c}{\beta} \\ -U_j^e = w_r^e t^\phi \frac{t^\mu U_i^c}{\beta} \end{cases} \quad (6)$$

The first equation expresses the transfer while the second translates the unemployment duration. The transfer appears under different forms in the two equations. In the first, it hides in the recipient's consumption function that it finances until a successful outcome of the search. The marginal utility of consumption decreases when the transfer increases and vice-versa, making it an inverse function of (an unspecified but increasing and positive function of) the transfer:

$$U_j^c = [f_1(T)]^{-1} = f_1^{-1}(T) \quad (7)$$

In the second equation, the transfer appears in the reservation wage. Given that the transfer is the searcher's sole non labour income, it holds the place of unemployment benefits in that wage:

$$w_r = T + \frac{\lambda}{\rho} \int_{w_r}^{+\infty} F(w) dw \quad (8)$$

where λ is the arrival rate of job opportunities, ρ , the discount rate (of the searcher not the donor) and $F(w)$, the wages distribution. Based on the transfer variation over the duration, it can be said that the environment is not stationary (Van den Berg, 1990). Nevertheless, the fact that the donor cannot access information on the job search creates a compartmentalization that would make this non stationarity partial if the job arrival rate and the wage distribution were to be constant. That constance would have the transfer explain the entire variation of the reservation wage. If the exterior determinants vary, the wage and the transfer would still be fluctuating in the same direction, unless the exterior impact outweighs the effect of the transfer. It can be asserted that this is unlikely because the arrival rate decreases as the unemployment spell lasts. Employers read in the duration a signal of the individual's skill deterioration. The less attractiveness of the individual's labour supply results in a lower job arrival rate.

If we suppose a partial stationarity (which favours the stability of μ and ϕ), the reservaton wage can be expressed as:

$$w_r = w_r(T, \lambda, \rho, F(w)) = f_2(T) \quad (9)$$

When we take those expressions into account, the system becomes:

$$\begin{cases} f_1^{-1}(T) = \frac{t^\mu U_i^c}{\beta} \\ -U_j^e = f_2(T) t^\phi \frac{t^\mu U_i^c}{\beta} \end{cases} \quad (10)$$

By rearranging the variables in a manner that showcases the duration in the second equation, we obtain:

$$\begin{cases} f_1^{-1}(T) = \frac{t^\mu U_i^c}{\beta} \\ t^{\mu+\phi} = \frac{-\beta U_j^e}{f_2(T) U_i^c} \end{cases} \quad (11)$$

The logarithmic development make the negative relationship between the unemployment duration and the transfered amount more obvious.

$$\begin{cases} -\ln(f_1(T)) = \mu \ln(t) + \ln(U_i^c) + \ln(\beta) \\ (\mu + \phi) \ln(t) = -\ln(f_2(T)) - \ln(-U_j^e) - \ln(U_i^c) + \ln(\beta) \end{cases} \quad (12)$$

Based on the system, we can say that time deteriorates the donor's generosity towards the job searcher while a high level of transfer favours a lengthening of the unemployment duration.

We develop now the utility functions. For the donor, let us consider that the utility function is linear

$$U_i(C) = X_i' \beta_i + \omega_i \quad (13)$$

X_i' is a set of variables relative to the donor, covering as well the aspects of the household environment (size of the household, his position in the hierarchy, other members' income, etc.) as the market conditions (social and professional category, activity sector, wage, job security, etc.). As for ω_i , it is the error term in the estimation of the utility. Given that, $U_i = X_i' \beta_i + \omega_i = \ln(\exp(X_i' \beta_i + \omega_i))$, the marginal utility of consumption can be expressed as⁴:

$$U_i^c = (\exp(X_i' \beta_i + \omega_i))^{-1} \quad (14)$$

The job search disutility for the recipient can be developed too. Here, one can consider that the time spent on the search could constitute an indicator of the effort, but that would be misleading. The information asymmetry prevents the donor from knowing the use made of that time and of the means used as well. The wage distribution, however, shows some reliability in that regard. Its stability allows asserting that the higher wage the searcher demands, the smaller the opportunities. Inversely, the lower he is willing to go in his demands, the more he expands his opportunities. When we consider that the effort is embodied in the information gathering and processing the searcher has to go through before applying at a job (drawing from the wage distribution), we can

⁴Since the utility is based on a consumption, it can be seen as finite, which would make the derivate 1

say that the unemployed individual with low wage demands will bear less search disutility, everything equal (including time), than someone who is demanding high. The wage have to be excluded from the information package, since the searcher is not supposed to know it. However, the characteristics of the job do not have to be. Therefore, we can consider that:

$$-U_j(e) = Z'_j \gamma_j + \omega_j \quad (15)$$

Z'_j represents a set of variables concerning the job targeted by the recipient and his attitude towards the labour market (professional status, targeted sector, income regularity and stability, proximity of the job location, hours, willingness to adjust the demands if the duration lengthens, etc.) and ω_j , the error term of the equation. The marginal disutility of the search effort is:

$$-U_j^e = (\exp(Z'_j \gamma_j + \omega_j))^{-1} \quad (16)$$

With, these specifications, we can rewrite the system:

$$\begin{cases} \ln(f_1(T)) = -\mu \ln(t) - \ln(\exp(X'_i \beta_i + \omega_i))^{-1} - \ln(\beta) \\ (\mu + \phi) \ln(t) = -\ln(f_2(T)) - \ln(\exp(Z'_j \gamma_j + \omega_j))^{-1} - \ln(U_i^c) + \ln(\beta) \end{cases} \quad (17)$$

and end up with:

$$\begin{cases} \ln(f_1(T)) = -\mu \ln(t) + X'_i \beta_i + \omega_i - \ln(\beta) \\ (\mu + \phi) \ln(t) = -\ln(f_2(T)) + (Z'_j \gamma_j + \omega_j) + (X'_i \beta_i + \omega_i) + \ln(\beta) \end{cases} \quad (18)$$

We notice an asymmetrical impact of the agents on one another: while the job search disutility is absent from the donor's function, the donor's consumption is present in the recipient's function. That presence is independent of the transfer, which is separately expressed. The recipient being egoist, the donor's real consumption only affects him through the transfer. The presence of that consumption rather translates the way the conditions the donor, directly or indirectly, surrounds the recipient with determine his preferences on the labour market. The children tend to be drawn to the same professions as their parents; they search in their jobs the same (or some of the) characteristics as of their parents'. The duration equation, therefore, depends on the variables of the transfer equation ($Z_j = (X_i | Z_j)$) though the transfer equation remains independent from the variables determining the duration ($X_i = X_i$). Knowing that β is stable, it integrates the constant of the equation, giving k , and considering that U_i^c can be read through $Z'_j \gamma_j$, we can say:

$$\begin{cases} \ln(f_1(T)) = -\mu \ln(t) + X'_i \beta_i + k_i + \omega_i \\ (\mu + \phi) \ln(t) = -\ln(f_2(T)) + Z'_j \gamma_j + k_j + v_j \end{cases} \quad (19)$$

where v is a linear function linéaire of the two error terms.

2.2 Remarks on the model

We can make five remarks on the model, related as much to its advantages as to its position regarding other works in the literature.

First, the model sets in line with the recursive relation between the unemployment duration and the non labour resources of the unemployed and, by extension, between the former and the reservation wage. It strays from the compensatory logic present in the Becker (1974) rotten-kid model⁵ where the transfer reacts positively to the donor's income ($\partial T/\partial Y_i > 0$) et negatively to the recipient's ($\partial T/\partial Y_j < 0$). Here, the transfer determines the searcher's preferences and strategies on the market and allows him, if high, the manoeuvre to seek for jobs that match better his aspirations. It sustains the reservation wage and lengthens the duration, to which it reacts, in return. The donor using it as the only signal (though t is the only parameter we introduce, we can consider that μ brings in some additional elements) of the progress of the search and of the recipient's likelihood of integrating the intergenerational solidarity chain, it restricts the searcher's option.

Second, it is noticeable that the effort is absent from the donor's function. In that regard, our model differs from the one by Chami (1998). In that model, the effort is present twice in the donor's function: directly, as a "merit good", and indirectly, through the recipient's function. In our case, the information asymmetry prevents the donor from knowing the effort. Since the effort does not (systematically) result in an income that might alleviate the transfer, the signal that informs the donor on the recipient market strategies (preferences, means used, time spent on the search, etc.) disappears. By considering solely the unemployment duration, the donor embraces fully this information limitation and tries to overcome it. The time-contingency of the transfer is not necessarily prejudicial to the beneficiary if the donor takes into account the market parameters in the evaluation of μ . We end up with an impure altruism model. The exchange motive based on the effort show more suitability for an African society than one based on a care giving quid pro quo. The transfer could be linked to the attention and care given to the donor, as in the model by Cox (1987), but then the unemployed individual would have to compensate the income lack with a participation at the service production. When that production is more representative of a sexual division of the labour, as in African societies, than it is of a quid pro quo, the model might lead to erroneous conclusions. Based on our data set, it appears that the weekly amount of time spent on household production is only 2.63 hours for men (in our sample) while coming close to 20 hours for women. That illustrates women's specialization in the household production, whether it is primarily aimed to benefit a donor or not. Therefore, the service model may fail to apprehend correctly the context.

Third, compared to the mutualism model, whose central idea we used, the model is less restrictive. In that model, also know as the "family constitution" model or "the child as old-age security" model, parents transfer to their offspring, as an investment for their old days, while financing the grandparents retirement, as a payback for the prior transfer by those. A game, embracing more or less this logic, is proposed by Samuelson (1958) where every generation's retirement is financed by its predecessor. It lacks, however, precisions as for the investment that must be prior to the giving back. This model offers

⁵Laferrère and Wolff (2005) give a portrait the literature on the subject. They present the Becker model and its underlying hypotheses, as well as other models.

a likely portrait of African families. Parents take care of the children hoping they will return the favour. That idea explains the reproduction behaviour: in addition of establishing a man's virility, the number of his children translates the financial and material security he can hope for in his old days. Despite of its strength in terms of likelihood, the model hardly makes a room for an unemployed member. It isolates the participants by assuming a similarity of preferences over the contracting generations, which means that they arbitrate in favour in participating regardless of the exterior parameters, whether better or less attractive. Their preferences are impervious to those parameters that are ignored or neglected. That makes the model unfit to approach the link that might exist between that environment and the unemployed participant's situation. Moreover, the contract entirely dissociates the transfer, whether incoming or outgoing, from the participants' income (the altruism model does not), pronouncing its unfitness for our study. The separation between these elements may result from the certainty that for every transfer there is a payback, mainly because it supposes that the rules presiding at the transfers are unanimously dictated and that there is a punishment system for defectors. An individual who fails to transfer to the preceding generation exempts the following generation from any obligation of transfer to him. Any failure to comply with the constitution results in an exclusion. This rule, necessary for the model survival, empties it out of any affections when only those can maintain the intergenerational (and also intragenerational) solidarity despite of failures. In our model, the solidarity chain remains vital in the donor's decision but he makes it less categorical. That adjustment conserves the insurance spirit, but does not evacuate the assistance, which can come through altruism (β) or even empathy μ .

Fourth, our model does not give the family transfer a systematic superiority over the market transactions in terms of information. There can be found many arguments in favour of the inter vivos transfers (we can mention Ben-Porath (1980) and Pollak (1985)) as a preferable option when compared to the market transactions, especially when the transfers are approached in an intertemporal manner (Cox and Japelli (1990)). In the household environment, the moral hazard and adverse selection risks are supposed to be smaller due to the closeness that allows for the donor to have a solid knowledge of the recipient's situation and, therefore, to make an informed decision. Moreover, the mutual trust and informality that it favours should reduce the transaction costs for both parties. Our model does not translate the closeness in terms of knowledge because the job search takes place on a territory that is outside the donor's supervision. The constant adjustment of the transfer to the unemployment duration illustrates that.

And finally, it must be noted that, in all likelihood, the impact of the duration on the transfer cannot be indefinite. Though it cannot be asserted whether the transfer decrease over the unemployment duration is due to slow down, recurring facts sustain the thesis of a minimal level for transfer, insensitive of the duration. It can be identified as the non monetary advantages the job searcher can access unconditionally (housing, food, healthcare in case of need, etc.), because beneficiary an invariable affection from the donor or the community of benefactors. As mentioned previously, many unemployed individuals are financially supported by their family though they do not receive a transfer.

3 Data

3.1 Survey

We will implement the model on the data of a 2004 household survey (*Enquête Permanente Auprès des Ménages*) conducted by the Malian employment agency (*Agence Nationale Pour l'Emploi*⁶). The survey concerned 2,500 households on the entire territory, 180 of which resided in Bamako, the capital, 320, in other urban areas, while 2,000 lived in rural regions. It aimed to collect information on the labour market in order to make reliable estimations of the labour indicators and to guide the employment policies. The questions were primarily designed to inform on the respondents' labour market situation and their working conditions such as their wage (level, regularity, variance, etc.), their status (employed, inactive or unemployed), their institutional sector (formal or informal) etc., but they also took an interest in their household environment through variables such as the household size, the marriage regime (monogamous or polygamous), the members non labour income (estate, transfers, remittances, etc).

Based on the conceptual definition of unemployment (an individual who is not working, is available for a job and is seeking for one), we count in the dataset 412 observations matching an unemployment status. We took into account the age restriction, the age bracket being 15-64, so to be in line with the official figures. Amongst the unemployed respondents, 359 informed on their unemployment duration while 327 (79%) declared to be supported by their family. In that population, only 238 individuals gave an estimation of the transfer they monthly receive from the family members (mainly the head of household). And of that groupe, only 140 simultaneously gave a precise number concerning the duration of the current unemployment (in months) along with information on other variables. They make our sample; the small size explains our rather restricted choice in variables.

3.2 Variables

We will, in a first place, use a Double Square Least Stage method (2SLS) to estimate the equation, and then, given that we use cross sectional data with which heteroscedasticity is inevitable, we will use the Generalized Moments Method (GMM).

3.2.1 The transfer equation

There are three categories of variables in the transfer equation ($\ln(T)$, T is in Franc Cfa⁷):

- The household labour incomes (FCFA): we associated with each individual the sum of the household members' labour income. This choice reflects

⁶The report (DOEF, 2004) on that survey is available on the agency Internet site, www.anpe-mali.org.

⁷The franc Cfa has a constant conversion rate with the euro: $e1 = FCFA655.957$.

less any income pooling hypothesis - in fact, the majority or the totality of that income is brought in by the head of household - than it allows us to include the few individuals whose family's bread winner was the household head's wife or an elder sibling;

- The non labour incomes (FCFA): we applied the same principal. Though all the resources have been taken into account (monthly rent on real estate, interests on financial assets, alimony for the divorced, pension for the retirees, etc.), the heart of this variable resided in the remittances, a vital source of income for Malian families. We also included the interhousehold transfers, within the country but, most of the time, between different locations as the case of offsprings who move out or to another town but send some money back home;
- The position in the family hierarchy: we also included dummy variables on the individuals' position in the family order (head of household, spouse of the "head", child of the "head", nephew or niece, etc.). These variables allow apprehending the importance of the social and cultural construction;
- Gender and residency area: we finally took into account the gender and the living area of the individual.

3.2.2 The duration equation

In the duration equation ($\ln(t)$, t is in months), we mobilized the variables concerning the individual's strategies on the market. We excluded the reservation wage, which is already present through the transfer, to avoid colinearity and we mainly relied on dummy variables informing on those strategies. We considered:

- The type of the job: through this variable, we will highlight the preference for the wage earning jobs (as opposed to self-employment), whose popularity is related to their stability and the regularity of the income;
- The work time: we included the amount of time the searcher wishes to work weekly and how the preference between the fulltime (35 hours and more) and the part-time (less than 35 hours) affects the duration;
- Sectors: we considered the targeted sector (public service, state-owned firms or private sector);
- Finally, we considered that the duration depends on the labour market pressure. We therefore introduced the unemployment rate in different forms, each carrying a hypothesis on the information asymmetry between the recipient and the donor. The use of the age-bracket specific rate ($\ln(U_a)$) - we took five-year-wide brackets - assumes that the market pressure that may harden the recipient's chances at employment has no impact whatsoever on the donor's income or transfer. The youth of the unemployed population and the considerable role of the household head in the transfer suggest an age difference that helps this hypothesis. With the region specific rate ($\ln(U_j)$), the donor may not be completely isolated from the pressure that is considered, but his relative exposure to that pressure (that may find a manifestation through the donor's income) must

not lead to systematic dismiss. With the different specifications, we will see how the hypotheses affect the model.

3.2.3 Descriptive Statistics

Before we present the results and comment, it is necessary to explore the statistics so to describe the unemployed individuals' environment. The variable that offers a multidimensional glimpse at that environment is the household labour income.

First, that income, dominated by the household head's income (0.98 of the total as noted in table 2), informs in many ways on the "head's" profile, which, in turn, explains the searcher's preferences. The "head's" income is correlated to his status on the labour market⁸. Agents from the formal sector earn more than those in the informal segment of the economy. The former are mainly composed of executives and middle management agents (whether in the administration, the state-owned firms or in the private companies) while among the latter, the majority is self-employed. Due to that correlation between the income and the professional status, we excluded that latter from the variables list. The income also carries information about the "head's" age, to which it is positively correlated. That relation is intertwined with the category because the "formal agents" who earn more are 40 years old in average (44 for the civil servants (DOEF, 2003, 2007), 38 for the private sector agents) whereas the average is between 28 and 30 for the "informal agents".

Second, we note that the household labour income shows a positive correlation (0.33) to the household size. This relation cannot be interpreted as a result of the "head's" or the head couple's reproductive behaviour since the size includes the extended family members. It rather means that the members tend to concentrate around the person who succeeds professionally and makes a good living. That concentration is an outstanding characteristic of the Malian society. It disguises as well a "survival community" - the non-working and unemployed family members have no other choice but to turn to the resourceful members for support - as it translates an intergenerational solidarity, vertical and horizontal - the "one-who-made-it" is seen (sometimes actually is) as return on investment from the family or the community, the investment going from actual material support to blessings (the Malian society has a belief system, Islam or the old traditions, that attributes some virtues to the elder's blessings) -. The support finds a justification on both parties. If the head of household were not predominant in the income, the correlation would rather illustrate a "choice community" because the household would be a group of independent and resourceful individuals who could live separately but chose to live together. In such case, and if the data allowed, a multi donor model would have fitted better.

Third, we notice a positive correlation between the household income and the level of education of the unemployed person (0.10). That relation illustrates a social reproduction. The parents' income, essentially the head's, linked to their own education level, favours the trajectory of their offspring in school, as much in terms of advancement as in terms of orientation. The individuals

⁸This paragraph is based on the comments of a study estimating the wage curve on the Malian labour market. See Bah (2011). The unpublished paper is available on demand.

whose household head works in public administration reveal a distinctive preference for public service and the wage earning jobs. As for those from a private agent (formal or informal sector) leading household, their preference goes to entrepreneurship; they want to work in small or middle sized firms. The conclusion we draw from the income in the estimation can therefore be related to all those aspects of the searcher's environment.

4 Results and Comments

4.1 Methodology and Specification Tests

The basic model is built around the transfer. The equation includes the unemployment duration and the aforementioned variables. The OLS regression (1) is presented in the table 3. We notice an elasticity of 0.12, meaning that a 10% increase of the unemployment duration leads to a 1.2% decrease of the amount of transfer. Though this result conforms to the prediction of the model, it is necessary to test its econometric robustness. The determination coefficient of the regression is 0.309, meaning that the model allows to explain almost the third of the transfer variance. Moreover, we found that the null hypothesis of variables omission can be rejected because we found a statistic $F(3; 127) = 1.08$ with a p-value of 0.362. The basic model seems therefore strong⁹. Nevertheless, it remains to test the hypothesis of simultaneous determination which, if verified will imply a non convergence of the OLS estimators. The simultaneity involves a correlation between the unemployment duration and the error term of the transfer equation, which illustrates the impact of the duration on the transfer. To test this hypothesis, we need instrumental variables that would explain a part of the duration that is independent from the transfer but correlated to the error term. The choice of variables depends on the hypothesis we make about the information asymmetry between the donor and the recipient. In (2), we added the unemployment rate to the list of instrumental variables. We took a rate specific to the recipient's age bracket, which differs from the age bracket of the donor. The market pressure is included, but the age circumscription isolates the donor from it.

A first test of the instruments quality can be read in their capacity to explain the variance of the instrumented variable. The determination coefficient is only 7.54%, showing that we have weak instruments. However, the equation is solid because the RESET test shows that the null hypothesis of variables omission can be rejected. We obtained a statistic $F(3; 127) = 1, 57$ and a p-value around 0.199¹⁰. This shows that, despite of their weakness, the instruments justify a pursuit of the estimation.

We included then the predicted values of the unemployment duration in the basic model. In (3), we can notice that the determination coefficient remains practically at the same level: 31,3% against 30,9% before. Therefore, the instruments are consistent. We proceeded with the Hausman test, aiming to show whether the instrumented variable is endogenous or exogenous. We introduced

⁹The Breusch-Pagan/Cook-Weisberg test show that the null hypothesis of homoscedasticity can be rejected. We obtain a statistic of 1.18 for a 0.278 p-value.

¹⁰We also found that the regression is heteroscedastic because the null hypothesis can be rejected for a statistic 0.58 following a χ^2 law and having a p-value of 0.444.

in the basic regression the residues from an auxiliary equation, which is the regression of the duration on all the variables (instrumental and exogenous). The augmented equation (4) we obtained shows the same coefficients as the 2SLS regression (5), the differences appearing the standard errors. The coefficient of the residue strays slightly away from the nullity hypothesis with a p-value at 0.101. This value being practically equal to the 10% level, we can reject the null hypothesis of the Hausman test and accept that the duration is endogenous. The Wu-Hausman statistic confirms the same thing; for a level of $F(1, 129) = 2,728$ its p-value is 0.101. As for the Durbin-Wu-Hausman statistic following a χ^2 law, it converges with a p-value of 0.089 for 2.899. We can accept the postulate of a simultaneous determination of the transfer and the unemployment duration in the Malian case. We tested the instruments furthermore with a Sargan test and obtained a statistic inferior to a $\chi^2(0,90 ; 8) = 10,057$. The null hypothesis of this inferiority cannot be rejected because the p-value is 0.261. The strength the instruments show despite of their weak role in explaining the duration suggests that the hypotheses underlying their choice is to be examined closely.

We therefore adopted modes of instrumenting. The results are presented in the table 4. We can notice that the elasticity level varies depending on the instruments, especially the unemployment rate we choose. With the age-bracket specific rate of unemployment, the elasticity is -0.436. The high level of this elasticity, when compared to the OLS estimated level (-0.116), can be interpreted as the consequence of a difference of μ across the donor population. When the donor does not dismiss the labour market pressures (as experienced by the donor) as an explanatory element of the unemployment duration, μ is likely to be affected of the donor's empathy, which varies from one donor to another, impacting ultimately the transfer response to the duration lengthening.

With the unemployment rate of the region (also taking into the difference between the urban and rural areas of the considered region), the elasticity is 0,328. The lower level of this elasticity (3), when compared to (4) translates less a convergence of information treatment among the donors - one can assume that the information on the general economic climate is more accessible than it is on an age class; therefore the donor can rely less on empathy and more on facts - than it translates a direct impact of the market pressure on the donor's income. The regional unemployment rate may affect the donor's income (through the wage curve); therefore its instrumental quality is compromised¹¹. That explain why the model fail the Hausman test. The p-value is 15%, making it hard to reject the null hypothesis that states that the duration is exogenous.

With the unemployment rate that is simultaneously specific to the age class and the residency area ($\ln(U_{aj})$), we found results reflecting a position between the two former specifications. The elasticity is 0.410 whereas the p-value is 11% for the Hausman test. The Sargan test is conclusive with a 10.72 statistic and a 0218 p-value.

¹¹The regional unemployment rate could have been used as a direct exogenous variable in the transfer equation, but that would have assumed that the transfer reaction to the regional labour market pressure is systematic. That would require the stability of all the other variables in X'_i , which cannot be accepted since those variables are correlated to the labour income, especially the "head's" (see the table 2). The market pressure transits through X'_i before reaching T .

We noted that the equations are heteroscedastic. The null hypothesis of the error terms equality across the observations can be rejected for both of the interest variables. We cannot determine a precise cause for the heteroscedasticity because we notice disparities between different groups (men and women; rural and urban inhabitants). To correct the heteroscedasticity, we use the GMM to re-estimate the system. The results are in the table 5.

5 Comments

5.1 The unemployment duration

The GMM improves the models without altering the results. We notice a negative relation between the transfer and the unemployment duration. The individuals who have lasted longer in unemployment declared, everything equal, lower amounts of transfer than the unemployed who newly arrived in the job search arena. The relationship between the transfer and the duration can be intuitively deduced from the average unemployment durations in the table 1. When the observations are restricted to the transfers recipients, the unemployment duration is 58 months in average; it rises to 71 months when they are extended to the non receiving individuals. This proves that the duration lead to the disappearance of the transfer. By introducing second order polynomial term of the unemployment duration in the regression, we obtained a minimum¹² set around the 54th month of unemployment. After four years and half in unemployment, the unemployed individuals stop receiving transfers, though their family still keep supporting them. That confirms the suggestion of the fifth remark on the model. There is a minimum level for the transfer, translated in the *unconditional* access to common goods of the household¹³.

Moreover, it can be noticed that with the GMM results that the elasticities converge. The elasticities of the instrumental specifications including the age-bracket specific rate of unemployment, the regional rate of unemployment and the age bracket and region specific rate of unemployment are respectively -0.392, -0.373 and -0.352. Based on the solidity of the specification with the unemployment rate of the recipient's age bracket, we can say that a 10% increase in the unemployment duration lead to a transfer decrease neighbouring 4%. We can say that this elasticity is entirely subordinated to the household dynamics because the heterogeneity across the population has been controlled in its main forms: the gender-based and the area-based gaps. In the table 1, it can be seen that men are more favoured in the transfers than women while their unemployed duration is lower. Their duration is 38 months in average against 77 months for women (50.6% less). In terms of transfer, they obtain 50% more than women; they receive on average FCFA 16,500 per month, quite above the level FCFA

¹²With the second order polynomial term, the coefficient is $b = -0.687$ (p-value = 0.011) and the squared term is $a = 0.0859$ (p-value = 0.029). The minimum is: $\Delta = -\frac{b}{2a} = 4$. To switch to month, we calculated: $\exp(4) = 54$.

¹³By choosing to read in the absence of a declaration about the transfer a depletion of the compensation privileges, we kept from using a Heckman method to correct the selection bias. That would certainly have broadened the sample, but the variables used in the correction process would have conditioned the relationship between the transfer and the duration, making the method prevail on the data in the outcome of our study.

10,971 women rely on to support themselves. There are also spatial differences between the individuals of the sample. The urban areas living unemployed individuals monthly receive FCFA 14,615 while their average duration is 52 months whereas their rural counterparts settle for FCFA 11,194 per month during a longer period, 76 months. The maintaining of the negative sign (and the results of the tests) illustrates that the hypothesis of a negative relationship between the transfer and the unemployment holds in the case of Mali, even when the individual heterogeneities are taken into account.

5.1.1 The household incomes

The impact of the household labour income is positive (OLS : $1.18e-7$; 2SLS (U_a) = $1.44e-07$; GMM (U_a) = $1.58e-07^{**}$). Its significance depends on the specification while to coefficient fails often the alternative hypothesis. That can be linked to the insufficiencies of the data. On the 2,500 households surveyed, less than 400 declarations on the labour income of the household head were collected. That leaves out a substantial share of households. Many individuals did not communicate an income either because it was not stable or because they do not keep counts (mainly the self-employed).

Based on the income relation to the household head's professional category, we can generally say that an unemployed individual with a household head working in the formal sector has a more protected "unemployment compensation" than one whose household head is in the informal sector. As we can noticed in the table 1, the transfers are high when the "head" is a boss or upper level management (FCFA 23,333) or a middle management (FCFA 29,000). These two categories count more people from the private sector than from the public sector, though few agents can be count among the middle management. The public sector agents are more present among the executives who distribute a more moderate transfer (FCFA 11,700). Their level is inferior to the transfers distributed by self-employed "heads" (FCFA 11,929). However, their unemployed household members have a shorter unemployment duration, 27 months against 52 months.

A first explanation can come from the geographic differences. The formal sector is concentrated in urban areas - especially Bamako -, where the unemployment duration is lower, while the informal sector has a major presence in the country where the duration is high. The second explanation is related to the networks the unemployed members can access through the household head. The job searchers are more likely to embrace those networks when they lead to secure jobs, as in the formal, than when they keep them unstable and low-waged jobs, as in the informal. The third reason for the duration difference is the searcher's own characteristics. The positive relationship between the "head's" income and the searcher's level of education means that the searchers from a household led by a formal working head are more likely to have a higher level of education and, therefore, to be offered a larger range of opportunities on the labour market than those from an informal agent led household.

The non labour incomes have a higher and stronger coefficient (OLS : $1.08e-06^{**}$; 2SLS (U_a) = $1.35e-06^{**}$; GMM (U_a) = $1.50e-06^{***}$). The importance of the remittances in that variable suggests that the labour market strategies of unemployed individuals are affected members of other households (regardless of

the distance between those households and the one the individual belongs in). That importance links the level and the nature of the transfer to a relationship that can go beyond the donor and the recipient; it involves the relationship between the receiving member's household and the giving member's households belonging. That relationship being exterior to the household dynamics presiding at the rules of transfers (level, origin and periodicity of the remittances, for instance), we do not have the necessary information to interpret the coefficient in a direction that can characterize that relationship.

5.1.2 The hierarchy

Our results also show that the transfer is sensitive to the recipient's position the family hierarchy. A spouse position relatively lessens the impact of time on the transfer. Its coefficient is the highest (OLS: -0.64). They are followed by the children of the household (OLS: -1.16) who, in their turn, are more favoured than the spouses' siblings (OLS: -1.54). Though one might be drawn to interpreting the children's coefficient as the sign of the main giver's deeper affection, an explanation can be found in their age difference and, by extension, in the intergenerational cycle (as in the mutualism model), that is to say the recipient position in the solidarity chain.

The unemployed who are offsprings of the head are 22 years old in average, which is inferior their uncles' and aunts' average, 27 years. The former, generally newly grads, receive much more assistance in their attempts to integrate the labour market; their close ones mobilize as well their financial resources as their social networks (friends, colleagues, etc.) to help them. The latter, that remained unemployed for a much longer period, find their transfer amount much more degraded by the time effect. It can be said that their position in the solidarity chain plays a role. They are closer to occupying a donor's position; their failure to do so can bring the donor to see them as unwilling to try hard or to be less choosy between opportunities. The parameter μ might therefore rise (in absolute while, remaining negative).

The age effect may hold for the overextended family too, but their situation is more complex. This group counts the cousins and nephews and nieces who move from parental homes (villages, rural regions) to bigger town for high school or university. Their situation tends to be closer the uncles' and aunts' because their average age is 26 years, but their transfer is larger. The answer is in the transfer they may also receive from the parents and other relatives in the same town or from their direct relatives back home.

Although the heads of household were excluded from the regression (to avoid perfect colinearity and also because they only make 16% of the sample), it is necessary to shed a light on their position. Their transfers resist time better than any other position. A first explanation can come from the spouse's support, which, when approached, turns out to come from prior savings, generated by former jobs. A second element is the unemployment duration itself. The household head responsibilities¹⁴, especially the expectation for him to provide, exert a pressure on the consumption utility of the unemployment state. The marginal utility of the consumption can easily increase, leading to a reduction

¹⁴Those responsibilities make it hard to keep an egoism postulate for the recipient when the unemployed individual is the household head

the reservation wage and a lowering of the demanded conditions and, overall, to a shortening the unemployment duration. The unemployment exit remains nevertheless strongly tied to the individual's characteristics (education, age, experiences, etc.). The duration for "head" that is 78 months lowers dramatically when restricted to male "heads" living in urban areas (65 months) because unemployment is more likely to last for rural populations (less opportunities) and women (discrimination). And it may not be erroneous to say that the figure might be lower if the exits were counted (which we hope future surveys will).

6 Conclusion

In conclusion, we can retain that the hypothesis of a simultaneous determination of the inter vivos transfer and the unemployment duration holds in the Malian case. The relationship between the two variables is negative : the transfer decreases over the duration of the unemployment spell.

This assessment conforms to the common characterization of the reservation wage because the trajectory of the transfer leads its decrease over the duration of the unemployment spell, as concluded by many studies in the literature [we can mention Kasper (1967), Kiefer and Neumann (1979, 1981), Van den Berg (1990), Cases and Lollivier (1993) or Rioux (2001) who worked on the french data]. In the studies on the developed countries, the decrease of the reservation wage can be linked to the policies on the unemployment benefits because their distribution is assigned to institutions and the decrease a term of that distribution. Therefore there is an underlying ideas that, based on the relationship between the reservation wage and the terms of the policies (the amount of the benefits and their duration), the policies can be adjusted and encourage the job acceptances by the unemployed individuals. Lynch (1983), based on the UK data, found that a 10% increase of the benefits leads to a 1% increase of the reservation wage and therefore to the lengthening of the unemployment duration. On the US data, Moffitt (1985) estimated at 0.4 the unemployment duration elasticity of the level of benefits. The results obtained by Meyer (1990) (US data) and Narendranathan et al. (1985) (UK data) converge in the same direction: the unemployment duration lengthens when the unemployment benefits increase. When the benefits duration increases, the outcome is the same. Moffitt and Nickolson (1982) suggest that a week increase of that duration lead to a 0.1 increase in the unemployment duration. Katz and Meyer (1990) found an elasticity around 0.2 on the US data.

Though our results converge with those conclusions as for the nature of the relationship between the reservation wage (in the partial non stationarity, the transfer explain the reservation wage) and the unemployment duration, their explanatory power as to the responsibility of the household support in the unemployment condition is limited. That limitation due to the to the household environment itself. In the presence of an institution, the reaction of the benefits to the duration is determined regardless of the job search strategies; the benefit decrease is contingent to the duration only. That may not be the case in the household environment. Though we assumed a complete isolation of the donor's decision from the recipient's strategy, many elements, especially the tests on the instruments (that show that isolation hypothesis is hard to establish) tend to

prove that we did not completely apprehend the impact of the duration on the transfer. That means the negative relationship between the transfer and the unemployment duration may not systematically translate the responsibility of the searcher in the unemployment duration nor exclude it. The donor's income, for instance, may be sensitive to the recipient's status (the workers in the informal sector most of the time mobilize labour supply of their offspring), in which case the decrease of the transfer will not necessarily translate a sanction by the donor nor an attempt to prevent a moral hazard. The same way, we noticed that an individual position in the hierarchy determines the stakes of employment and affect their strategy. If the utility associated with an employment (because of the position) is higher than the one associated with unemployment (the reservation wage is inferior to the non labour income), then the duration stops reflecting the job searcher's behaviour. It may mean that the market opportunities are too insufficient. However, the duration may have more to do with the searcher's preferences than the market insufficiencies. To draw a line between the two situations, there is a need for more studies, which we hope future surveys will allow.

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Table 1: Descriptives Statistics

| Variables | Age (years) | Transfer (FCFA) | Duration (1) (months) | Duration (2) (months) |
|------------------------|--------------------------------------|--------------------------|--------------------------|--------------------------|
| | Gender | | | |
| Men | 29.41 (1.86) | 16,500 (20,757.92) | 38.71 (32.71) | 65.89 (89.08) |
| Women | 28.7 (10.27) | 10,971.43 (8,879.18) | 77.29 (85.70) | 75.9 (83.10) |
| | Residence area | | | |
| Urban | 28.5 (10.41) | 14,615.38 (16,556.06) | 51.91 (54.71) | 57.39 (63.49) |
| Rural | 30.67 (14.55) | 11,194.44 (14,828.2) | 75.58 (94.02) | 82.31 (98.63) |
| | Job history | | | |
| Previously worked | 36.031 (12.31) | 20,031.25 (21,977.24) | 44.75 (39.34) | 52.08 (49.34) |
| | Family hierarchy | | | |
| Head of household | 45.75 (9.24) | 32,150 (29,274.16) | 78 (91.91) | 108.85 (125.73) |
| Spouse of the "head" | 35.56 (10.19) | 9,375 (5,702.34) | 100.4 (91.52) | 91.76 (97.45) |
| Child of the "head" | 22.62 (5.88) | 10,269.23 (12,641.54) | 40.75 (29.88) | 46.24 (50.22) |
| Sibling of a spouse | 26.33 (7.17) | 6,166.67 (2,401.39) | 38 (27.01) | 60.05 (43.14) |
| Extended family | 26.34 (9.71) | 12,609.76 (8,610.69) | 49.05 (36.64) | 51.47 (40.16) |
| | Household head's professional status | | | |
| Executive | 25.3 (4.90) | 11,700 (5,034.33) | 27 (21.99) | 27.66 (22.91) |
| Middle management | 28.2 (4.38) | 29,000 (14,317.82) | 33.6 (17.8) | 56.79 (49.03) |
| Upper level management | 22 (6.56) | 23,333.33 (23,629.08) | 16 (6.93) | 13.75 (7.23) |
| Self employed | 27.48 (10.15) | 11,928.57 (12,327.14) | 51.52 (40.5) | 54.63 (50.57) |
| Observations | 140 | 140 | 140 | 359 |
| Mean | 29.06 (11.6) | 13,735.71 (16,147.08) | 58 (67.47) | 71.41 (85.86) |

Standard errors in parentheses

Table 2: The household income and the unemployed individual's environment

| Correlation coefficients | | | |
|--------------------------|-----------------|-----------------|-----------------------|
| Variables | "Head's" income | Schooling years | Size of the household |
| Coefficients | 0.98 | 0.10 | 0.33 |
| Observations | 140 | | |

Table 3: Instrumented Regression of Transfers ($\ln(T)$) on the Unemployment Duration ($\ln(t)$)

| Variables | (1) OLS | (2) dura. | (3) predict. | (4) aug_equa. | (5) 2SLS | (6) GMM |
|---------------------------------------|--------------------------|---------------------|-------------------------|---------------------------|--------------------------|---------------------------|
| Unemployment duration (\ln) | -0.116* (0.0641) | | -0.384** (0.190) | -0.436** (0.204) | -0.436** (0.216) | -0.392** (0.187) |
| Household labour income | 1.18e-07 (9.09e-08) | | 1.21e-07 (9.07e-08) | 1.44e-07 (9.17e-08) | 1.44e-07 (9.71e-08) | 1.58e-07** (6.47e-08) |
| Household non labour income | 1.08e-06** (4.82e-07) | | 8.69e-07* (4.80e-07) | 1.35e-06*** (5.06e-07) | 1.35e-06** (5.35e-07) | 1.50e-06*** (2.86e-07) |
| Urban areas | 0.631*** (0.155) | | 0.631*** (0.154) | 0.522*** (0.168) | 0.522*** (0.177) | 0.496*** (0.183) |
| Men | 0.267* (0.153) | | 0.275* (0.151) | 0.0780 (0.191) | 0.0780 (0.202) | 0.129 (0.203) |
| Spouse of the "head" | -0.635** (0.255) | | -0.639** (0.254) | -0.552** (0.258) | -0.552** (0.274) | -0.672** (0.274) |
| Child of the "head" | -1.169*** (0.181) | | -1.283*** (0.191) | -1.203*** (0.181) | -1.203*** (0.192) | -1.368*** (0.212) |
| Sibling of a spouse | -1.538*** (0.341) | | -1.680*** (0.347) | -1.529*** (0.339) | -1.529*** (0.359) | -1.646*** (0.294) |
| Extended family | -0.764*** (0.200) | | -0.799*** (0.202) | -0.850*** (0.206) | -0.850*** (0.218) | -0.941*** (0.243) |
| Unemployment rate ($\ln(U_a)$) | | -0.250 (0.225) | | | | |
| Residue of aug. equ. | | | | 0.355 (0.215) | | |
| Waged job | | -0.178 (0.202) | | | | |
| Full-time job | | -0.0698 (0.219) | | | | |
| Job in public administration | | -0.750* (0.437) | | | | |
| Job in state owned firms | | -0.566* (0.314) | | | | |
| Job in an NGO | | -1.370* (0.715) | | | | |
| Job in small firms | | -0.217 (0.239) | | | | |
| Reason: wage too small | | 0.436* (0.234) | | | | |
| Reason: tough market | | 0.520** (0.246) | | | | |
| Constant | 9.626*** (0.336) | 2.921*** (0.599) | 10.65*** (0.774) | 10.95*** (0.869) | 10.95*** (0.920) | 10.89*** (0.810) |
| Observations | 140 | 140 | 140 | 140 | 140 | 140 |
| R^2 ajusté | 0.309 | 0.0754 | 0.313 | 0.318 | 0.176 | 0.204 |
| Wu-Hausman (F) | | | | | 2.73 0.101 | |
| Durbin-Wu-Hausman (χ^2) | | | | 2.90 | | |
| Sargan (S)/Hansen (J) (χ^2) | | | | | 0.089 10.06 0.261 | 9.477 0.304 |

- (1) Transfer equation
(2) Duration equation
(3) Transfer equation with duration predicted values
(4) Transfer equation wit auxiliary equation residues
(5) 2 Stage Least Square Method (2SLS)
(6) Generalized Moments Method (GMM)
(6) GMM specification with gender and location

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: 2SLS specifications

| Variables | (1) OLS | (2) 2SLS | (3) 2SLS (U_j) | (4) 2SLS (U_a) | (5) 2SLS (U_{aj}) |
|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Unemployment duration (ln) | -0.116* (0.0641) | -0.561** (0.244) | -0.328** (0.165) | -0.436** (0.216) | -0.410* (0.210) |
| Household labour income | 1.18e-07 (9.09e-08) | 1.54e-07 (1.04e-07) | 1.35e-07 (9.21e-08) | 1.44e-07 (9.71e-08) | 1.42e-07 (9.58e-08) |
| Household non labour income | 1.08e-06** (4.82e-07) | 1.45e-06** (5.78e-07) | 1.26e-06** (5.00e-07) | 1.35e-06** (5.35e-07) | 1.33e-06** (5.28e-07) |
| Urban areas | 0.631*** (0.155) | 0.479** (0.192) | 0.558*** (0.164) | 0.522*** (0.177) | 0.531*** (0.175) |
| Men | 0.267* (0.153) | 0.00431 (0.221) | 0.141 (0.178) | 0.0780 (0.202) | 0.0935 (0.198) |
| Spouse of the "head" | -0.635** (0.255) | -0.519* (0.294) | -0.580** (0.259) | -0.552** (0.274) | -0.559** (0.270) |
| Child of the "head" | -1.169*** (0.181) | -1.216*** (0.206) | -1.191*** (0.183) | -1.203*** (0.192) | -1.200*** (0.190) |
| Sibling of a spouse | -1.538*** (0.341) | -1.525*** (0.385) | -1.532*** (0.342) | -1.529*** (0.359) | -1.530*** (0.354) |
| Extended family | -0.764*** (0.200) | -0.884*** (0.235) | -0.821*** (0.205) | -0.850*** (0.218) | -0.843*** (0.215) |
| Constant | 9.626*** (0.336) | 11.47*** (1.036) | 10.51*** (0.715) | 10.95*** (0.920) | 10.84*** (0.894) |
| Observations | 140 | 140 | 140 | 140 | 140 |
| R^2 adjusted | 0.309 | 0.0528 | 0.250 | 0.176 | 0.197 |
| Wu-Hausman (F) | | 4.78 | 1.98 | 2.73 | 2.38 |
| Durbin-Wu-Hausman (χ^2) | | 0.03 | 0.16 | 0.10 | 0.13 |
| Sargan (S) | | 5.00 | 2.11 | 2.90 | 2.53 |
| (χ^2) | | 0.03 | 0.15 | 0.09 | 0.11 |
| | | 6.047 | 10.37 | 10.06 | 10.72 |
| | | 0.534 | 0.240 | 0.261 | 0.218 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: GMM specifications

| Variables | (1) GMM | (2) GMM (U_j) | (3) GMM (U_a) | (4) GMM (U_{aj}) |
|-----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Unemployment duration (ln) | -0.597*** (0.216) | -0.373** (0.173) | -0.392** (0.187) | -0.352** (0.176) |
| Household labour income | 1.57e-07** (6.55e-08) | 1.51e-07** (6.73e-08) | 1.58e-07** (6.47e-08) | 1.62e-07** (6.50e-08) |
| Household non labour income | 1.67e-06*** (3.18e-07) | 1.48e-06*** (2.80e-07) | 1.50e-06*** (2.86e-07) | 1.46e-06*** (2.78e-07) |
| Urban areas | 0.419** (0.189) | 0.489*** (0.183) | 0.496*** (0.183) | 0.498*** (0.182) |
| Men | 0.0222 (0.226) | 0.131 (0.189) | 0.129 (0.203) | 0.149 (0.197) |
| Spouse of the "head" | -0.509 (0.311) | -0.618** (0.261) | -0.672** (0.274) | -0.679** (0.268) |
| Child of the "head" | -1.262*** (0.230) | -1.286*** (0.208) | -1.368*** (0.212) | -1.363*** (0.211) |
| Sibling of a spouse | -1.551*** (0.321) | -1.584*** (0.279) | -1.646*** (0.294) | -1.642*** (0.290) |
| Extended family | -0.899*** (0.264) | -0.892*** (0.229) | -0.941*** (0.243) | -0.932*** (0.239) |
| Constant | 11.63*** (0.904) | 10.76*** (0.757) | 10.89*** (0.810) | 10.73*** (0.774) |
| Observations | 140 | 140 | 140 | 140 |
| R^2 adjusted | 0.00732 | 0.221 | 0.204 | 0.230 |
| Hansen (J) | 5.063 | 8.281 | 9.477 | 9.538 |
| (χ^2) | 0.652 | 0.406 | 0.304 | 0.299 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1