

Jobs come and go, but the Family will always be there

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Abstract

The aim of this paper is to study what are the household coping strategies against labour market shocks. We argue that, in the absence of formal institutions that protect workers, individuals change their labour supply behaviour in response to shocks received by other household members. By exploiting a unique data of employment histories, we find evidence that individuals whose household members received a labour market shocks are 4 times more likely to exit their current status than their counterpart. We interpret these results as proving evidence that, in developing countries, the family works as a risk-sharing institution which protect its members from idiosyncratic shocks. Moreover, we find that this risk-sharing institution is built around the role of women. Specifically, women whose household member received a labour market shocks have a hazard of leaving the current state over 5 times higher than men, suggesting that women are actually the ones who, most of the times, end up changing their labour supply in response to shocks received by other household members.

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1 Introduction

Risk is a central feature in the environment of developing countries. The occurrences of natural disasters such as droughts, floods, infectious diseases and price shocks imply that individuals in developing countries are constantly fighting and struggling for their survival. Furthermore, the severity of this issue is exacerbated by the fact that individuals have very low level of income and even shocks of relatively small entity may have irreversible consequences. Given the riskiness of the environment and the lack of social safety net to cope with such environment, individuals have to rely on informal arrangements in order to insure them-selves against risk. The family is one of such arrangements.

In all countries, but especially in developing countries, the family works as a small insurance company which protects its members against idiosyncratic risk. Many studies have highlighted the importance of the family as a risk-sharing institution, and have described how the household attempt to cope with shocks received (see [Kotlikoff and Spivak \(1981\)](#), [Kochar \(1995\)](#), [Jacoby and Skoufias \(1997\)](#) and [McKenzie \(2003\)](#)).

In this paper, we specifically investigate what are the household coping strategies against labour market shocks. Our hypothesis is that, as in a small insurance company, individuals change their labour supply according to the needs of the family and its members. In particular, the question we attempt to address is: "Do individuals change their labour supply behaviour in response to shocks occurred to other household members?" Moreover, we argue that this small insurance company institution is built around the role of women, in that, they are actually the ones who end up, most of the times, changing their labour supply behaviour in order to cope with shocks received by household members.

The literature of the added worker effect already highlighted the importance of women's labour supply as a household coping strategy against idiosyncratic risk. The added worker effect (AWE) consists of a temporary increase in the labour supply of the secondary worker, usually the woman, due to a spell of unemployment received by the husband. A theoretical framework on the AWE is offered by [Ashenfelter \(1980\)](#), [Mincer \(1962\)](#), [Heckman and Macurdy \(1980\)](#), [Lundberg \(1985\)](#) and most recently by [Attanasio et al. \(2005\)](#). Empirically, the investigation of the AWE has proven to be challenging.

In his seminal work [Mincer \(1962\)](#), using a cross-section, finds a strong and negative association between the proportion of women that worked during the year and the number of weeks worked by the husbands. This study, however, uses aggregated measures of labour supply, and it can only tell us that in areas where husbands work a fewer number of weeks female labour force participation is higher, but it does not tell us whether the former is the cause of latter. [Heckman and Macurdy \(1980\)](#) try to address this issue by means of panel data at the individual level, and find no significant evidence that the number of hours the

husbands spend in unemployment has an effect on the change in female labour supply.¹ Our work is particularly related to [Lundberg \(1985\)](#) who studies women transition probabilities from and to different labour market states and to what extent the transition probabilities differ according to the labour supply of the husband. Her findings suggest the existence of added worker effect for whites but she finds opposite results for blacks. Yet, modelling women's transition probabilities as a function of a static measure of husband's labour supply may suffer from endogeneity problem if individuals mate according to taste for labour supply.²

In this study, we use unique data of employment histories of urban households in Tanzania to test whether individuals use their labour supply as a coping strategy against labour market shocks. The main advantage of this data is that it gives the opportunity to model changes in labour supply behaviour as a function of labour market shocks received by other household members, rather than as a function of a static measure of employment status of other household members. We find that the hazard of leaving the current status is higher for individuals whose household members received a labour market shocks. Moreover, we find the hazard of leaving the current state is much higher for women than for men. In our opinion, this provide evidence that in developing countries the household works as a risk-sharing institution, and that individuals, and women in particular, change their labour supply behaviour in order to cope with labour market shocks received by other household members.

In the second part of the paper we focus on the destinations of exits; in other words, "what status do individuals move to in order to cope with the shocks received by their household members?" We find that men and women respond to shocks received by their household members in two distinct ways. On the one hand, men respond to shocks received by their household members by switching between job-types; women, on the other hand respond to shocks occurred to other household members by moving in and out of the labour force. We argue that both coping mechanisms work through the key role of buffer sector played by the household enterprise. Our argument is that the household enterprise works as Unemployment Insurance (UI) in developed countries, that is, in case of labour market shocks individuals will work in the household enterprise, rather than being unemployed, until they find better employment opportunities.

These results of this study imply that individuals rarely choose their labour supply according to their skills, ambition and career prospects, but rather according to the needs of the family and its members. The consequence of this behaviour may be an inefficient

¹Measured as the hours of work during the survey year.

²[Bhalotra and Umana-Aponte \(2010\)](#) avoid the issue of endogeneity by modelling women labour supply as a function of husband's employment status. They find that women labour supply behaviour is counter-cyclical to economic performances, suggesting that in period of economic downturn women are more likely to work and, vice versa, in case of economic upturns they are more likely not to work. They find, however, opposite results for the case of Africa, that is a cyclical behaviour of women labour supply.

allocation of human resources in the labour market. Because this is a case of market failure -incompleteness and lack of formal safety nets- there is scope for policy intervention in order to increase efficiency in the society. Moreover, the policy implications implied by our findings may favour women relatively to men, since women are more affected by shocks received by their household members.

The remainder of the paper is structured as followed. In section 2, we introduce the data used in the analysis and present descriptive statistics of the main variables of interest. Section 3 presents a simple model of labour mobility which highlights the variables to be included in the econometric model. In section 4, we present the econometric model and results. The robustness checks are presented in section 5. Finally, section 6 concludes.

2 Data and Descriptive Statistics

The data used in the study is three waves (2004, 2005, 2006) of the Tanzania Household Urban Panel Survey (THUPS), conducted by the Centre for the Study of African Economies (CSAE), at Oxford University, in collaboration with the Tanzania National Bureau Statistics (NBS). The THUPS is a labour market panel survey of urban sectors in Tanzania; it collects information on incomes, labour market experiences and educational attainments for labour force participants between the age of 15-65. Both workers in the formal and informal sector were interviewed.

The sample is bases on a stratified random draw of urban households from the 2000 Household Budget Survey (HBS), and it covers the main urban areas of Tanzania, including Arusha, Dar es Salaam, Iringa, Morogoro, Mwanza, and Tanga.

In this paper, we exploit two unique features of the survey in order to carry out the analysis. Firstly, it is a retrospective dataset. Specifically, during the 1st and 2nd wave, individuals were asked information about personal histories of employment since they left full-time school until the moment of the interview. For each individual, hence, the employment pattern is described by the time spent in each labour market status, and the dates at which transition from one state to the other were made. Secondly, it is a household survey. This means that we have recall information on employment histories for all the labour force participants in the selected household.

Combined, these unique features allow us to study the dynamics of employment for every individual and, most importantly, whether the dynamics of one family member are linked with the dynamics of other family members.

Table 1: COHORT DIFFERENCES

	Before 40s	40s	50s	60s	70s	80s
Occupation:						
<i>Self-employed</i>	0.64	0.51	0.61	0.59	0.62	0.46
<i>Entrepreneur</i>	0.28	0.22	0.30	0.23	0.20	0.20
<i>Number of Employeess</i>	2.75	3.11	1.74	1.68	1.83	1.25
<i>Wage employed</i>	0.14	0.34	0.34	0.35	0.30	0.21
<i>Public</i>	0.05	0.23	0.20	0.21	0.07	0.03
<i>Monthly Earnings US \$</i>	10.4	17.15	18.02	17.16	15.31	11.42
Human Capital:						
<i>Years of Schooling</i>	4.11	6.74	6.57	7.91	8.31	7.74
<i>Experience</i>	34.16	28.32	25.62	16.56	9.28	2.82
<i>Tenure</i>	21.82	17.73	16.00	10.38	6.16	2.37
<i>Father's Education</i>	3.38	4.19	5.65	6.41	8.07	8.13
<i>Mother's Education</i>	1.79	1.80	2.89	4.21	4.80	5.66
Demographics:						
<i>Female</i>	0.39	0.33	0.43	0.57	0.55	0.52
<i>Age</i>	71.00	57.08	48.44	39.06	29.14	20.99
<i>Age First Job</i>	26.02	24.56	22.20	21.68	19.70	17.73
<i>Age Entered Labour Force</i>	26.02	24.14	21.89	20.96	18.87	17.23
Observations	44	92	150	246	328	198

Source: Own calculations based on the Tanzania Household Urban Panel Survey.

2.1 Descriptive Statistics

Since we are dealing with recall data, in order for individuals to be comparable, we need to account for cohort effects. We identify six cohorts of individuals according to their date of birth -those individuals born before 1940, those born in the 1940s, 1950s, 1960s, 1970s and 1980s- and we compare them in table 1.

The table shows that the proportion of individuals currently in self-employment is constant, between 50-60 percent, for individuals born in different cohorts. Of those who are self-employed, only a small fraction(20 to 30 percent) report to have employees. As expected, either because of the increase managerial experience or the accumulated capital over the years, older individuals are the ones with a greater number of employees. The number employees, on average, is between 1 and 3, suggesting that the businesses in urban Tanzania take the form of small household enterprise.

There is a decline in the proportion of individuals currently in wage employment. Specifically, the proportion of individuals currently in wage employment who were born in 40s is 34 percent, while the proportion of individuals born in the 80s who are currently wage employed is 21 percent. This pattern is even stronger if we consider individuals employed in the public sector: 23 percent of individuals born in the 40s are currently working in the

public sector, against only 3 percent of those born in the 80s. These numbers suggest that, after an initial expansion of the public sector between the 40s and 60s, this sector became congested and could not absorb new waves of labour.

This table, however, only tells us the current occupation of individuals born at different point in times. To see the dynamics of employment over time, in figure [A.1](#) we plot the proportion of self and wage employed against time. We see clearly that the two lines mirror each-other quite closely. The proportion of self-employed decreased until 1970 and then increased back steadily until 2000. On the contrary, the proportion of wage employed was very low in the 40s, it increased steadily and peaked in 1970, and then decreased again. The figure seems to underline the function of self-employment as a buffer sector; that is, those who cannot have a salaried job will tend to become self-employed and work in the household enterprise, rather than stay unemployed.

The level of (monthly) earnings is higher for older cohorts. This is to be expected, as earnings are likely to increase with work experience. Notice, in the table are reported median values of earnings, as opposed to mean values, in order to avoid the results to be driven by outliers.³

Younger cohorts appear to be more educated than older ones. As expected, individual born in the 60s and 70s report the highest level of education. This is probably due to the Education Act 1978, which envisaged free primary compulsory school for all children in schooling-age 7 to 13. Enrolment rates rose steadily until the mid 80s and the fell because the educational infrastructure could not sustain this enrolment growth.⁴ We can clearly see this pattern in the data. Parental education as well follow this increasing pattern.

Finally, it is interesting to observe differences in the age at which individuals entered the labour force. Assuming all individuals reported their entire job history, we see that past cohorts enter the labour market at an older age than more recent cohorts. Specifically, individuals born before the 40s, on average, entered the labour market at the age of 26, as opposed to those born in the 80s, who entered at the age of 17. We do acknowledge, however, that this result maybe driven by recall bias.

In tables [A.1](#) and [A.2](#). in the appendix, we report the same comparison, but distinguishing between men and women, respectively. Overall, the key variables of interest follow the same pattern of the overall sample. Two key points are worth noticing. First, the gender gap in education level is gradually shrinking over time: the number of completed years of schooling for women is increased steadily over time. Second, this reduction in the education gap, did not translate into a reduction in the earnings gap between men and women.

³All earnings amount are deflated using the Retail Consumer Price Index (1995=100), used by [Rankin et al. \(2010\)](#).

⁴See for example [Nerman and Owens \(2010\)](#).

Table 2: DIFFERENCES BETWEEN INDIVIDUALS WHO DID AND DID NOT SWITCH STATUS

	Switched Status	Did not Switch Status
Job-type:		
<i>Self-employed</i>	0.69	0.59
<i>Wage employed</i>	0.27	0.30
Human Capital:		
<i>Years of Schooling</i>	7.20	6.06
<i>Experience</i>	17.60	10.86
<i>Tenure</i>	9.30	10.86
<i>Father's Education</i>	5.42	5.73
<i>Mother's Education</i>	3.19	3.31
Household:		
<i>Household Head</i>	0.60	0.48
<i>HH Enterprise</i>	0.37	0.32
Demographics:		
<i>Female</i>	0.47	0.45
<i>Married</i>	0.74	0.77
<i>Children</i>	3.69	3.42
<i>Age</i>	36.82	30.80
<i>Age First Job</i>	20.11	21.06
<i>Age Entered Labour Force</i>	19.56	20.52
Observations	5377	4352

Source: Own calculations based on the Tanzania Household Urban Panel Survey.

2.2 Who are the “Switchers”?

The first question we want to address is: “do we observe systematic difference between individuals who switched and did not switch labour force status in their employment history?” (Henceforth we use the shorthand *status* for ‘labour force status’ unless stated otherwise.) In table 2, we compare these two categories of individuals. Self-employed are more likely to switch status than wage employed; this is to be expected, as transition in and out self-employment is relatively easy because of the lack of entry or exit cost [Basu et al. \(2000\)](#).

Individuals who switched status are more educated than their counterpart, suggesting that education may be an important factor which explains labour mobility. On the other hand, individuals who never switched status appear to have better parental background.⁵ This could imply that parents with better background may be able to find secure and steady occupations for their sons/daughters through their networks.

Further, it appears that individuals who are household head and individuals whose family currently owns a household enterprise are more likely to having switched status.⁶ Again, this

⁵Although only the difference is maternal education is statistically significant.

⁶Both differences are statistically significant at 1% level

suggest this could suggest the role of the small household enterprises as a buffer sector in cases of need by members of the household. Finally, individuals who did switch status are older than those who never switched, as they probably have been for longer in the labour force.

2.3 Family and Women

In this subsection, we investigate the role of the family as provider of insurance against idiosyncratic risk in the labour market for its members. In particular, we are interested in whether individuals change their labour supply behaviour in response to labour market shocks received by other household members.

In order to proceed with the investigation, we match employment histories of different household members over time, and check whether the duration of an individual's spell is affected by a labour market shock occurred to other household members in a particular point in time. Figure 1 offers a graphical representation of a spell of an individual in the sample. The figure shows that at some point during the spell, say at time t , a household member of the individual received a labour market shock. The question we attempt to address, therefore, is whether the shock received by the other household member will affect the duration of the spell of the individual.

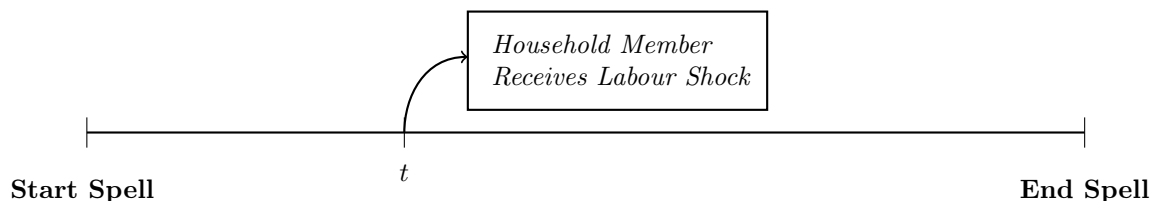


Figure 1: The figure shows the spell of individuals whose household member received a labour shock.

What events constitute labour market shocks? In this paper, we use the following definition of shocks:⁷

- (i) *Negative Shock*: if an individual (1) becomes unemployed, (2) becomes inactive and (3) receives a pay-cut;
- (ii) *Positive Shock*: if an individual (1) becomes employed and (2) receives a pay-raise;
- (iii) *Any Shock*: we define "any shock" the combination of the two above.

⁷In the final part of the paper we change these definitions to check the robustness of our findings.

Table 3: KAPLEIN-MEIER SURVIVOR FUNCTION FOR THE DURATION OF THE SPELL.

<i>Duration</i> (years)	(1)	(2)	(3)	(4)
	Did Not Receive Shock	Did Receive Shock	Did Not Receive Neg. Shock	Did Receive Neg. Shock
1	99.5	99.1	99.5	98.9
2	98.8	97.2	98.7	97.6
3	98.2	96	98.1	97.5
4	97.5	94	97.4	96.2
5	96.8	92.5	96.7	93.3
6	95.8	90.9	95.7	91.7
7	95.1	89.8	95	90.5
8	94.7	89.1	94.5	88.4
9	94.1	88.8	94	88.4
10	93.5	87.6	93.3	86.5

Source: Own calculations based on the Tanzania Household Urban Panel Survey.

According to the above definitions, for every individual we create a (sequential) dummy variable which equals one if, during a certain spell of individual’s employment history, another member of the household receives a labour market shock. These variables will be the main focus of the paper, as we are interested in whether and how individuals respond to shocks received by other family members. In tables 3 and 4, we present data of the duration of the individual’s spells, and we compare duration patterns of individuals whose household members did and did not receive labour market shocks.

In table 3 we compare Kaplan-Meier survivor functions for individuals whose household members did and did not received labour market shock. Specifically, in columns (1) and (2), we see that individual whose household members received a shock, are less likely to *survive*, that is, they are more likely to exit their current status. This effect is even stronger when, in columns (3) and (4), we consider only negative shocks. Again, the table suggests that individuals whose household members received a negative shock are less likely to stay in the current status.⁸ So far, the data support the hypothesis that individuals change their labour supply behaviour in response to shocks received by other household members.

In this paper, we argue that the institution of the family is built around the role of women; that is, women are actually the ones who most of the times end up changing their labour supply in response to the needs of the household. If our hypothesis is correct, then we should observe women to have a stronger response -a lower survival time- than men to shocks received by other household members. In table 4 we do this comparison, and the data appear to confirm our hypothesis. In columns (1) and (2), we compare survivor functions for men whose household members did and did not received any shock; we find very little difference in the two patterns, suggesting that men only respond marginally to shocks occurred to

⁸Complete Kaplan-Meier Survivor functions for the whole duration of the spells, can be found in figures A.2 and A.3 in the Appendix.

Table 4: KAPLEIN-MEIER SURVIVOR FUNCTION FOR THE DURATION OF THE SPELL - BY GENDER

<i>Duration</i> (years)	MEN		WOMEN	
	(1) Did Not Receive Shock	(2) Did Receive Shock	(3) Did Not Receive Shock	(4) Did Receive Shock
1	99.5	99.4	99.5	98.8
2	98.8	98.3	98.8	95.9
3	98.3	97.8	98.1	94
4	97.6	96.7	97.4	93
5	97	95.4	96.6	89.2
6	96.2	93.6	95.4	88
7	95.4	91.9	94.8	87.5
8	95.1	91.9	94.3	85.9
9	94.6	91.9	93.6	85.9
10	93.9	90.8	93.1	83.3

Source: Own calculations based on the Tanzania Household Urban Panel Survey.

other household members. In columns (3) and (4), we perform the same comparison but for the sample of women. We see clearly that women whose household members receive a shock have a much lower survival time than their counterpart, confirming that women are indeed the fundamental unit of the institution of the family and they change their labour supply behaviour when other household members receive a labour shock.⁹ Before we test the robustness of these results by means of formal regression framework, in the next section we derive a simple model which permits the identification of fundamental variables to be considered in the econometric model.

3 A Simple Model of Labour Mobility

We use the latent variable framework to model the choice individual i has to make at each point in time $t \in \{1, 2, \dots, T\}$ between two alternatives: (a) switch current status and (2) do not switch status. The main assumption of the model (which we then test in the next section) is that when deciding whether to switch or not status, individual will take into account the needs of the family and its members. Let D_{it} be a dummy variable which describes the decision between the two alternatives. Specifically,

$$D_{it} = \begin{cases} 1 & \text{if } i \text{ switches status;} \\ 0 & \text{if } i \text{ does not.} \end{cases}$$

We prefer not to specify any specific type of transition; so that D_{it} could be interpreted for example, as the choice of entering the labour force, or moving form unemployment to

⁹Again, in figures A.4 and A.5 in the Appendix, are reported the patterns of the survivor function for the whole duration of the spells.

employment or switching between job-types.

In a dynamic model,¹⁰ the individual will maximise the expected present value of the remaining life-time utility at time t . Two important factors will influence this choice: (1) the state space, denoted Ω_{it} , which consists of all the determinants of the decision at time t ; and (2) the discount factor, δ . The value function of the agent will be:

$$V_t = \max_{D_{it}} \mathbb{E} \left[\delta^{\tau-t} \sum_{\tau=1}^t U_{i\tau} | \Omega_{it} \right]; \quad (3.1)$$

where U_{it} is the utility function of the individual at each point in time. Let the utility of individual i be:

$$U_{it} = c_{it} + \alpha_{it} D_{it}, \quad (3.2)$$

that is, the utility of individual i at time t depends on current consumption, c_{it} , and on the utility the individual would get switching is current status, α_{it} . If, for example, the individual is currently unemployed, then α_{it} is the utility individual i attaches to leaving unemployment; if instead individual i is inactive, then α_{it} would be the utility of entering the labour force. Let the utility of switching current status be described by the following function:

$$\alpha_{it} = \pi_1 S_{-i,t} + \pi_2 H_{-i,t} + \mathbf{X}'_{it} \beta + \varepsilon_{it}, \quad (3.3)$$

where \mathbf{X}'_{it} is a vector of individual's characteristics, such as gender, education, age and parental background. As said above, the main assumption of the model is that the individual's choice will be affected by the condition of his household members. This assumption is represented by the terms $S_{-i,t}$ and $H_{-i,t}$. Specifically, $S_{-i,t}$ is a dummy variable which takes value of unity if, at time t , a household member received a labour market shock (as defined in the previous section); and $H_{-i,t}$ is the proportion of household members employed -excluding individual i .¹¹ Finally, ε_{it} is a random disturbance which represents random events that may affect the choice of switching status, such as changes in the value of leisure time, job separations and, the random arrival of job offers. When maximising his utility, individual i will face the following budget constraint:

$$c_{it} = Y_{it}^1 D_{it} + Y_{it}^0 (1 - D_{it}) + \lambda \sum_{j \neq i} Y_{jt}. \quad (3.4)$$

¹⁰We choose a dynamic model, as opposed to a static one, because past choices of the individuals are likely to affect the current decision.

¹¹This term can be interpreted either as representing *altruism* between family members (Becker, 1974) or, alternatively, the term can simply reflect risk-sharing behaviour of completely selfish individuals (Kotlikoff and Spivak, 1981).

Where Y_{it}^1 is the potential income individual i would get if he changes status and Y_{it}^0 is the actual income in his current status. Consumption may also depends on overall income of other household members, $\sum_{j \neq i} Y_{jt}$, and $\lambda \in [0, 1]$ represents the share individual i can use of that income. Plugging equation 3.3 and 3.4 into equation 3.2 will imply:

$$\begin{aligned} U_{it}^1 &= Y_{it}^1 + \lambda \sum_{j \neq i} Y_{jt} + \pi_1 S_{-i,t} + \pi_2 H_{it} + \mathbf{X}'_{it} \beta + \varepsilon_{it} && \text{if } D_{it} = 1; \\ U_{it}^0 &= Y_{it}^0 + \lambda \sum_{j \neq i} Y_{jt} && \text{if } D_{it} = 0. \end{aligned}$$

Then, the value function will be:

$$V_t(\Omega_{it}) = \max_{D_{it}} \mathbb{E} \left[\sum_{\tau=t}^T \delta^{\tau-t} (U_{i\tau}^1 - U_{i\tau}^0) | \Omega_{it} \right]. \quad (3.5)$$

Alternatively, the value function can be written as the maximum between the value functions under the two specific alternatives, that is,

$$V_t(\Omega_{it}) = \max (V_t^1(\Omega_{it}), V_t^0(\Omega_{it})); \quad (3.6)$$

where $V_t^1(\Omega_{it})$ and $V_t^0(\Omega_{it})$ both satisfy the bellman optimality condition, that is:

$$\begin{aligned} V_t^1(\Omega_{it}) &= U_{it}^1 + \delta \mathbb{E} [V_{t+1}^1(\Omega_{i,t+1}) | \Omega_{it}, D_{it} = 1]; \\ V_t^0(\Omega_{it}) &= U_{it}^0 + \delta \mathbb{E} [V_{t+1}^0(\Omega_{i,t+1}) | \Omega_{it}, D_{it} = 0]. \end{aligned} \quad (3.7)$$

The latent variable function, $\nu_{it}^*(\cdot)$, the difference in the value function under the two specific alternatives, $V_t^1(\Omega_{it}) - V_t^0(\Omega_{it})$, will be:

$$\begin{aligned} \nu_{it}^*(\Omega_{it}) &= U_{it}^1 - U_{it}^0 + \delta \{ \mathbb{E} [V_{t+1}^1(\Omega_{i,t+1}) | \Omega_{it}, D_{it} = 1] - \mathbb{E} [V_{t+1}^0(\Omega_{i,t+1}) | \Omega_{it}, D_{it} = 0] \}; \\ \nu_{it}^*(\Omega_{it}) &= \pi_1 S_{-i,t} + \pi_2 H_{-i,t} + Y_{it}^1 - Y_{it}^0 + \mathbf{X}'_{it} \beta + \xi_{it}, \end{aligned} \quad (3.8)$$

Where $\xi \equiv \varepsilon_{it} + \mathbb{E} [V_{t+1}^1(\Omega_{i,t+1}) | \Omega_{it}, D_{it} = 1] - \mathbb{E} [V_{t+1}^0(\Omega_{i,t+1}) | \Omega_{it}, D_{it} = 0]$. Hence, $\nu_{it}^*(\cdot)$ is given by the current difference in utilities between the two specific-alternatives, and the difference in the future component of the two expected value functions, under the two specific-alternatives, switching or not. This function shows the variables of interest that will affect the individual's choice between the two alternatives. Firstly, the two terms that describes that the overall condition of the household, $S_{-i,t}$, $H_{-i,t}$; as we mentioned above. Secondly,

the difference between potential and actual earnings, $\Delta Y_{it} \equiv Y_{it}^1 - Y_{it}^0$; this term represents the idea, expressed by Roy (1951), that individual switch status overtime in search for better available earnings opportunities. In particular, one can identify the value of ΔY_{it} , which we denote $\Delta Y_{it}^*(\Omega_{it})$, such that the individual is indifferent between switching or not his current status.

$$v_{it}^*(\Omega_{it}) = 0 \iff \Delta Y_{it}^*(\Omega_{it}) = -\pi_1 S_{-i,t} - \pi_2 H_{-i,t} \pi - \mathbf{X}'_{it} \beta - \xi_{it}. \quad (3.9)$$

If we consider, for example, the choice of entering the labour force or the choice of moving from unemployment to employment, then $\Delta Y_{it}^*(\Omega_{it})$ would be analogous of the *reservation wage* in the conventional job search theory. Moreover, equation 3.9 is very instructive in that it shows that is through the effect on the reservation wage that the condition of the other household members affect the individual's choice of switching or not. In the next section, we present the econometric model and results of our study.

4 Econometric Model and Results

4.1 Baseline Model

"Do individuals exit their current status in response to labour market shocks received by other household members?" In order to answer this question we use duration models. The aim of these models is the estimation of the hazard function, denoted $h(\cdot)$, which is defined as the probability of leaving the current status in the interval of time $[j - 1, j)$, conditional on not having left the current status up to time $j - 1$. Formally, let T be a random variable denoting the duration of a certain spell, then the hazard function is defined as:

$$h(j, \mathbf{X}_{it}|v_{it}) = Pr(j - 1 < T < j | T > j - 1, v_{it}), \quad (4.1)$$

where \mathbf{X}_{it} is the person-specific vector of covariates and v_{it} represent unobserved heterogeneity. Drawing from Jenkins (1995), in order to estimate discrete-time model we re-organise the data in a person-year identifier and create a sequential binary response variable which takes the value of unity when individual i leave his current status and zero otherwise. In this first stage of the exercise, we do not specify any destination of exit, as we are primarily interested on whether individual's hazard of exit will be affected by a labour market shocks received by other household members. We choose to use a mixed proportional hazard (MPH) model, as opposed to other specification, because it allows unobserved heterogeneity, v_{it} , to be accounted for. Assuming that the covariates affect the hazard in a complementary log-log link (*cloglog*), the way unobserved heterogeneity enters the model is the following:¹²

¹²See Jenkins (2005).

$$\begin{aligned}
h(j, \mathbf{X}_{it}|v_{it}) &= 1 - \exp[-\exp(\mathbf{X}'_{it}\beta + \mu(j) + \xi_{it})]; \\
\log[-\log(1 - h(j, \mathbf{X}_{it}|v_{it}))] &= \mathbf{X}'_{it}\beta + \mu(j) + \xi_{it};
\end{aligned}
\tag{4.2}$$

where $\mu(j)$ characterises the baseline hazard, which summarises the pattern of duration dependence which is common to all individuals, and $\xi_{it} \equiv \log(v)$ is the unobserved component. Again, \mathbf{X}_{it} is a person-specific vector of covariates to be included in the model, and is represented by the variables described in section (3), that is:

$$\log[-\log(1 - h(j, \mathbf{X}_{it}|v_{it}))] = \pi_1 S_{-i,t} + \pi_2 H_{-i,t} + \pi_3 Y_{it}^0 + \mathbf{X}'_{it}\beta + \mu(j) + \xi_{it}.
\tag{4.3}$$

The term of main interests is π_1 , as it represents the effect of a shock received by other household members on the hazard of leaving the current status. Because individuals may respond differently to shocks received by other household members according to the length of the shock, that is, according to whether the shock is temporary or permanent, we add to the model a variable which indicates the duration of the shock. As we do not have data on potential earnings, Y_{it}^1 (it would require to have data on all the wage offers received by the individuals - both accepted and declined), in the baseline model we only control for *actual earnings*, Y_{it}^0 .¹³ The other covariates included in the model are human capital variables, demographic variables and a set of town dummy variables.¹⁴

While the shape of the baseline hazard is typically the primary interest of applications of duration models, here the main interest is on the effect of shocks received by other household members, independently of the baseline. Therefore, as we prefer not to impose any functional form to the baseline hazard, $\mu(j)$, we chose a piece-wise constant specification.

4.2 Family as a Risk-sharing Institution

In table 5, we present the estimated coefficient of the MPH model. Specifically, in column (1) we report estimates of the effect of *any shock* received by other household members on the hazard of exit, while in columns (2) and (3) we distinguish between the effect of *negative* and *positive* shock, respectively.

According to the estimated coefficients, individuals whose household members received a labour market shock have a higher hazard of exit, that is, they are more likely to leave their current status than individuals whose household members did not receive any shock.

¹³In the next section, however, we address this issue by estimating an earnings function and including into the predicted values as a proxy for potential earnings.

¹⁴Unfortunately, we cannot include in the model important variables such as marital status and number of children of the individual, because we do not have these information retrospectively in the data.

Table 5: HAZARD OF LEAVING CURRENT STATUS

	(1) Any Shock	(2) Negative Shock	(3) Positive Shock
<i>Shock Received by HH Member</i>	1.484*** (0.189)	1.432*** (0.301)	1.317*** (0.262)
<i>Shock Duration</i>	-0.135*** (0.023)	-0.129*** (0.037)	-0.115*** (0.030)
<i>Proportion Employed Members</i>	0.390*** (0.133)	0.437*** (0.131)	0.402*** (0.134)
<i>Actual Earnings</i>	-0.024*** (0.002)	-0.024*** (0.002)	-0.024*** (0.002)
<i>Years of Schooling</i>	0.061** (0.026)	0.061** (0.026)	0.062** (0.026)
<i>Years of Schooling Squared</i>	-0.066 (0.170)	-0.063 (0.170)	-0.068 (0.170)
<i>Father's Education</i>	0.022*** (0.008)	0.023*** (0.008)	0.022*** (0.008)
<i>Mother's Education</i>	0.006 (0.009)	0.006 (0.009)	0.006 (0.009)
<i>Age</i>	0.048*** (0.012)	0.048*** (0.012)	0.048*** (0.012)
<i>Age Squared</i>	-0.080*** (0.019)	-0.080*** (0.018)	-0.080*** (0.018)
<i>Experience</i>	-0.059*** (0.012)	-0.058*** (0.012)	-0.059*** (0.012)
<i>Experience Squared</i>	0.084*** (0.019)	0.082*** (0.019)	0.085*** (0.019)
<i>Tenure</i>	0.029*** (0.011)	0.028*** (0.011)	0.029*** (0.011)
<i>Household Head</i>	0.268*** (0.090)	0.260*** (0.090)	0.251*** (0.090)
<i>Self-employed</i>	-0.256*** (0.073)	-0.249*** (0.073)	-0.253*** (0.073)
<i>Female</i>	-0.019 (0.076)	-0.021 (0.077)	-0.027 (0.077)
Observations	17536	17536	17536

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies. Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

If we consider the hazard ratios, 4.03,¹⁵ these indicate that the hazard of leaving the current status, on average, is 4 times higher for individuals whose household members received any shock than for those whose household members did not. In columns (2) and (3), we distinguish between negative and positive shocks, respectively, and the coefficients of interest are still positive and strongly significant suggesting that individuals whose household members received both negative and positive shocks have higher hazard of exit.

As expected, the estimated coefficient of the duration of the shock is negative and strongly significant in all specifications. This entails that the longer the time elapsed since the member of the household received a shock, the less likely individuals are to respond to the shock by leaving their current status.

In all columns, we observe a positive and highly significant association between the

¹⁵Here not showed for brevity.

proportion of members employed in the household and the hazard of leaving the current status. This could suggest that individuals are more willing to leave their current status if the overall situation of the household is good, as their transition will not have a such a strong effect on the well being of the household.

There is a negative and statistically significant association between actual earnings and the hazard of leaving the current state. This is to be expected, as the higher actual earnings, the less likely individuals are to leave their current status.

As emerged in the descriptive statistics, individuals with more schooling have higher hazard rate, suggesting that education increases labour mobility. Of the parental background variables, only the level of education of the father appears to have a positive and significant association with the hazard of leaving the current status. This may imply that fathers with better background and, presumably, better network may be an important determinant of labour mobility.

Individual's age have a positive effect on the hazard rate, suggesting that older individuals are more likely to leave their current status. This effect, however, is not constant, as the quadratic term is negative and statistically significant, suggesting that the increase in the hazard rate with age is declining in age.

The hazard of leaving the current status appear to decrease with experience. The higher the level of work experience, the less likely individuals are to leave their current status. On the other hand, the hazard rate increases with tenure; this is somewhat unexpected, and it might imply that the returns to tenure are not very high.

The estimated coefficients suggest that, everything else equal, the hazard of exit the current state is higher for individuals who are head of the household. On the contrary, individuals who are currently self-employed have a lower hazard rate. Finally, it appears to be no systematic difference in the hazard of exit the current state between men and women.

So far, we showed that individuals whose household members have been hit by a labour market shock are more likely to exit their current status. We interpret these evidence as supporting the idea that the household works as an risk-sharing institution that protects individuals from the occurrence of idiosyncratic shocks, and that individuals change their labour supply behaviour if other members of the household receive a labour market shock is one of the coping strategies of this institution.

Moreover, in this paper we argue that this risk-sharing institution is built around the role of women. In other words, we women are actually the ones who most of the times end up changing their labour supply behaviour as a response to shocks received by other household members. To test for this hypothesis, we next consider a model where we interact the effect of the shock received by other household members and the effect of gender (being female). A positive estimate of the coefficient would indicate that women have a higher hazard of leaving the current status than men, if their household members received a labour market shock.

Table 6: HAZARD OF LEAVING CURRENT STATUS - SHOCKS INTERACTED WITH GENDER

	(1) Any Shock	(2) Negative Shock	(3) Positive Shock
<i>Shock * Female</i>	1.646*** (0.246)	1.725*** (0.382)	1.455*** (0.345)
<i>Shock Duration</i>	-0.160*** (0.034)	-0.140*** (0.050)	-0.153*** (0.048)
<i>Proportion Employed Members</i>	0.388*** (0.132)	0.430*** (0.131)	0.418*** (0.132)
<i>Actual Earnings</i>	-0.024*** (0.002)	-0.024*** (0.002)	-0.024*** (0.002)
<i>Years of Schooling</i>	0.058** (0.026)	0.059** (0.026)	0.061** (0.026)
<i>Years of Schooling Squared</i>	-0.046 (0.170)	-0.049 (0.170)	-0.061 (0.170)
<i>Father's Education</i>	0.022*** (0.008)	0.023*** (0.008)	0.022*** (0.008)
<i>Mother's Education</i>	0.006 (0.009)	0.006 (0.009)	0.007 (0.009)
<i>Age</i>	0.049*** (0.012)	0.049*** (0.012)	0.048*** (0.012)
<i>Age Squared</i>	-0.081*** (0.018)	-0.081*** (0.018)	-0.079*** (0.018)
<i>Experience</i>	-0.058*** (0.012)	-0.058*** (0.012)	-0.059*** (0.012)
<i>Experience Squared</i>	0.083*** (0.019)	0.083*** (0.019)	0.083*** (0.019)
<i>Tenure</i>	0.028*** (0.011)	0.028*** (0.011)	0.028*** (0.011)
<i>Household Head</i>	0.238*** (0.090)	0.245*** (0.090)	0.244*** (0.090)
<i>Self-employed</i>	-0.257*** (0.073)	-0.252*** (0.073)	-0.252*** (0.073)
<i>Female</i>	-0.056 (0.078)	-0.042 (0.077)	-0.037 (0.078)
Observations	17536	17536	17536

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies. Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6, shows the results of this estimation. There is a strong and positive association between the new interaction term the hazard of leaving the current status. Specifically, the hazard ratios, 5.4, indicate that the hazard of leaving the current status is over five times higher as a response to shocks received from other household members, relative to men. In our opinion, this supports our argument that women are indeed the fundamental unit of the household as a risk-sharing institution and they are significantly more likely than men to change their labour supply behaviour according to the needs of the household and its members.

4.3 Destinations of Exit

In the previous section, we established that there is a statistically significant increase in the hazard of leaving the current status for individuals, and women in particular, whose

Table 7: HAZARD OF MOVING IN & OUT OF THE LABOUR FORCE

	INACTIVITY \rightarrow EMPLOYMENT		EMPLOYMENT \rightarrow INACTIVITY	
	(1) Negative Shock	(2) Positive Shock	(3) Negative Shock	(4) Positive Shock
Panel A: Men				
<i>Shock Received by HH Member</i>	-0.111 (0.836)	-0.726 (0.917)	- (.)	1.028 (1.521)
<i>Proportion Employed Members</i>	0.220 (0.458)	0.180 (0.424)	2.351** (0.966)	2.605*** (0.971)
Panel B: Women				
<i>Shock Received by HH Member</i>	0.908 (1.95)	1.451** (2.67)	2.843* (2.08)	2.067** (2.69)
<i>Proportion Employed Members</i>	-0.118 (-0.40)	-0.167 (-0.57)	0.489 (1.09)	0.319 (0.69)

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies. Robust standard errors in parentheses. Standard errors are clustered at the household level. * $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

household members receive a labour market shock. We next investigate the destinations of these transitions. In other words: “what status do individuals move to in order to cope with the shocks received by the other household members?” “And, do men and women cope with shocks received by other household members in the same way?” In order to investigate this issue, we estimate a series MPH models with multiple destinations.¹⁶ We focus our analysis on two types of transition: (a) in and out of the labour force and (b) transition between job-types.

In table 7 we report estimated coefficients of the transitions in and out of the labour force. Specifically, in columns (1) and (2) we consider the transition from inactivity to employment, while in columns (3) and (4) we consider the reverse transition, that is, from employment to inactivity. The results suggests that, for men, the hazard of moving in and out of the labour force is not affected by shocks received by other household members. In the second panel of table 7, however, where we consider the sample of women, the estimated coefficients of interest are statistically significant in all specifications, implying that women respond to shocks received by other household members by transitioning in and out of the labour force. It is worth noticing, that the proportion of employed household members are important determinants of the transition from employment to inactivity for men. This is not the case for women, implying that proportion of employed household members, are not what drives women’s to exit the labour force, but rather the shocks that receive other household members.

Taken at face value, the above results suggest that when a household member receives

¹⁶The identification of this models, however, relies on the *debatable* assumption that different destinations are independent between each others (Abbring and van den Berg, 2003).

Table 8: HAZARD OF MOVING IN & OUT OF THE LABOUR FORCE

	INACTIVITY → EMPLOYMENT		EMPLOYMENT → INACTIVITY	
	(1) Negative Shock	(2) Positive Shock	(3) Negative Shock	(4) Positive Shock
Panel A: Wage employment				
<i>Shock Received by HH Member</i>	0.800 (0.845)	0.867 (0.888)	- (.)	- (.)
<i>Proportion Employed Members</i>	0.703 (0.672)	0.603 (0.704)	2.710*** (0.997)	2.815*** (1.018)
Panel B: Self-employment				
<i>Shock Received by HH Member</i>	1.141 (1.67)	1.785** (2.94)	3.741*** (3.93)	2.321** (2.85)
<i>Proportion Employed Members</i>	-0.399 (-1.10)	-0.426 (-1.17)	-0.137 (-0.26)	-0.461 (-0.86)

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies. Robust standard errors in parentheses. Standard errors are clustered at the household level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

a negative labour market shock, women are more likely to exit the labour force and, vice versa, in case of a positive shock they are more likely to enter the labour force. These results are somewhat unexpected. As mentioned above, the theory of the added worker effect, in fact, would predict the opposite change in labour supply behaviour: a temporary increase in the labour supply of married women when their husbands receive a negative labour market shock. How can we reconcile the theory with our findings?

One potential explanation, consistent both with our finding and with the theory, is to consider the role played by the household enterprise (HE) as a family safety net. As shown in the summary statistics, it appears that the household enterprise works as a buffer sector, and household members rely on it in cases of need. In other words, the household enterprise work as Unemployment Insurance in developed countries, that is, in case of labour market shocks, rather than being unemployed, individuals work in the household enterprise until a better employment opportunities arrive. In this scenario, women play a key role in the function of this coping mechanism. They are in fact the ones who take care of the household enterprise, when the other family members are working in the labour market, and they are the ones who leave their position in the HE to members who received a (negative) labour market shock by moving out of the labour force. Vice versa, women will take over the household enterprise in case of positive shocks received by other household members, that is, all the members work in the labour market.

In order to further investigate this coping mechanism, we perform the same exercise as above, only for the sample of women, but we distinguish between wage and self-employment. Because the summary statistics showed that self-employment most often takes the form of household enterprise, if our hypothesis is correct then the shocks received by other household

Table 9: HAZARD OF SWITCHING JOB-TYPE

	SELF → WAGE EMPLOYMENT		WAGE → SELF-EMPLOYMENT	
	(1) Negative Shock	(2) Positive Shock	(3) Negative Shock	(4) Positive Shock
Panel A: Men				
<i>Shock Received by HH Member</i>	2.593** (1.203)	2.675 (1.882)	0.855 (1.097)	2.819*** (0.988)
<i>Proportion Employed Members</i>	0.749 (0.586)	0.565 (0.642)	-0.044 (0.528)	-0.078 (0.542)
Panel B: Women				
<i>Shock Received by HH Member</i>	1.347 (1.08)	1.440 (0.99)	3.509*** (4.00)	-
<i>Proportion Employed Members</i>	0.834 (1.05)	0.832 (1.03)	0.622 (0.68)	0.727 (0.78)

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies. Robust standard errors in parentheses. Standard errors are clustered at the household level. * $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

members should only affect the transition between self-employment and inactivity and not the transition between wage employment and inactivity. Table 8 shows the results of this exercise. In the first panel, where we consider transition between wage employment and inactivity the variable of interest are not statistically significant. In the second panel, instead, where we consider the transition between self-employment and inactivity the parameters of interest are strongly significant, confirming that women respond to shock received by other household members by moving in and out of the household enterprise.

Finally, in table 9, we consider instead the hazard of switching between job-type. The estimated coefficients in columns (1) and (2) suggest that men are more likely to transition from self-employment to wage employment if a member of the household received a negative shock. Moreover, in case a positive shock occurs to other household members, then men are more likely to transition from wage to self-employment. Again, these results are consistent with the fact that the household enterprise works as a family safety net. The second panel, instead, suggest that wage employed women whose household member received a labour market shock are more likely to become self-employed that women whose household members did not receive the shock.

To sum up, tables 7 and 9 show again that individuals respond to shocks received by other household members by changing their labour supply behaviour. Men and women, however, respond to these shocks with different coping mechanism. On the one hand, women cope with shocks received by other household members by moving in and out of the labour force, according to the needs of the family. Men, on the other hand, are more likely to cope with shocks received by other household members by switching job-type. In both cases, these coping mechanisms seem to work through the role played by the household enterprise.

5 Robustness Checks

5.1 Potential Earnings

Ideally, as equation 3.8 shows, we would like to include in the econometric model a measure of potential earnings, Y_{it}^1 , which describes the earnings individual i would earn if he were to switch status. However, we do not observe Y_{it}^1 , as we would need to observe all the job offers received by individual i -both accepted and declined. The exclusion of this variable in the model could be in principle very important since, as Roy (1951) suggested, individuals do take into consideration alternative earnings opportunities when deciding whether or not to switch status. In that case, our estimates may suffer from *omitted variable bias*. One way to overcome this problem is to estimate an earnings function, and use the predicted values of this estimation as a proxy for potential earnings. Therefore, we estimate the following Mincerian-type earnings function:

$$Y_{it} = \mathbf{Z}'_{it}\gamma + \epsilon_{it}, \quad (5.1)$$

where \mathbf{Z}_{it} is a vector of personal attributes of the individuals and ϵ_{it} is a random error term. The identifying assumption of this strategy is that at least one variable in \mathbf{Z}_{it} does not appear in the vector \mathbf{X}_{it} , i.e. exclusion restriction. Because of the nature of the data we have two distinct instruments for wage and self-employed. For wage employed, the instrument we chose is a dummy variable which equals one if individual i received an initial period of training when he started the job. For self-employed, instead, the instrument we choose is a dummy variable which takes value of unity if the individual is entrepreneur. In this case, the exclusion restriction implied by the instrumental variables is that, conditional on the controls included in the regression, *initial training* and *being an entrepreneur* have no effect on the hazard of leaving the current status, other than their effect through potential earnings.¹⁷ Tables A.4, A.5, A.6 and A.7 show the results of this exercise. We find that the estimated coefficient of the variables of interest are unchanged.

5.2 Different Definition of Labour Market Shocks

At the moment, the definitions we use of labour market shocks include variations in earnings received by the individuals. Specifically, according to our definition, a pay-cut would be accounted as a negative shock and, conversely, a pay-raise would be accounted as a positive shock. Two potential problems, however, may arise from using these definitions. Firstly, it may be argued that these variables may be sensitive to the type of deflator used. In other words, what appears to be a pay-cut using a certain type of deflator may be instead be a

¹⁷Table A.3 shows the results of the first stage regression.

pay-raise when using a different one. Secondly, and potentially more alarming, a pay-cut and a pay-raise may not entirely be *shocks*, in the strict sense of the exogenous occurrence of an event, but rather may be the outcome of the endogenous choice of the individuals. Specifically, we would have an endogeneity problem if individual choose to undergo a pay-cut or a pay-raise because they know their household member with cope with their movement, e.g. *reverse causality*. In order to account for this potential issues, we perform the analysis above with stricter definition of shocks which does not involve pay-cut and pay-raise. The results previously obtained change remarkably little. Tables [A.8](#), [A.9](#), [A.10](#) and [A.11](#) show the results of this exercise.

5.3 Town Specific Shocks

Finally, one can wonder whether the presented results are, one the one hand, showing a response of the individuals to shocks received by the other household members or, on the other hand, both the shock received by the household members and the change in the labour supply behaviour of the individuals are both due to a third variable, e.g. a *confounding factor*. The confound may be represented, for example, by certain events that occurred in certain towns in specific year that caused both the change in labour supply behaviour of the individual and the shock received by the household member. To address this issue, in addition to the time dummies described above, we add to the baseline model a set of time dummies interacted with town dummies to take into account shocks that are town and time specific. Tables [A.12](#) [A.13](#) [A.14](#) [A.15](#), once again, show that signs and significance level of the estimated coefficient of interested do not change.

6 Conclusion

Both developed and developing countries, individuals rely heavily on their family and household members to cope against idiosyncratic risk. This is especially true in developing countries, as safety social nets are incomplete and in some instances non-existent.

In this paper, we specifically investigate what are the household coping strategies against labour market shock. Our hypothesis is that, as in a small insurance company, individuals will change their labour supply according the the needs of the family and its members.

By exploiting a unique dataset of employment histories, we find evidence that the hazard of leaving the current status is higher for individuals whose household members received a labour market shocks. Moreover, we find the hazard of leaving the current state is much higher for women than for men. We interpret this evidence as supporting the idea that the household works as a risk-sharing institution, and that individuals, and women in particular, change their labour supply behaviour in order to cope with labour market shocks received

by other household members.

Moreover, we find that men and women respond to shocks received by their household members in two distinct ways. On the one hand, men respond to shocks received by their household members by switching between job-types; women, on the other hand respond to shocks occurred to other household members by moving in and out of the labour force. We argue that both coping mechanisms work through the key role played by the household enterprise. Our argument is that the household enterprise works as Unemployment Insurance (UI) in developed countries, that is, in case of labour market shocks individuals will work in the household enterprise, rather than being unemployed, until they find better employment opportunities. Clearly, more research is needed to verify further the key role played by the household enterprise in developing countries. Our results are robust to a number of checks, such as controlling for the effect of potential earnings, considering alternative definitions of shocks and, lastly, accounting for shocks that are town specific. Despite the robustness of our results, we are aware of the difficulty in interpretation of the results as *causal effects*. In particular, our estimates would suffer or reverse causality if individuals change their labour market status endogenously because they know that their family members will cope with this change. We prefer to interpret our results as associations between variables.

The findings of our study imply that individuals rarely choose their labour supply only according to their skills, ambition and career prospects, but rather according to the needs of the family. The consequence of this behaviour may be an inefficient allocation of human resources in the labour market. An interesting extension of our exercise would be to check (1) whether and to what extent this household coping strategy will affect individual's earnings and (2) whether the current gender gap in earnings can be explained by the fact women are more likely than men to change their labour supply behaviour in response to shocks occurred to their household members.

Because this is the case of market failure -incompleteness and lack of formal safety nets- there is scope for policy to increase efficiency. Our policy implications may favour women relatively to men, since women are more affected by shocks received by their household members. Different policy interventions, however, may work better than others, and this will depend upon the nature of such coping mechanism. On the one hand, if the studied household coping mechanism exists purely because the lack of formal insurance arrangements, that is, individuals would rather pursue occupations according to their skills, then the establishment of formal safety net would be likely to be an effective tool in order to increase efficiency. On the other hand, if the household coping mechanism is a reflection of the preferences of the individuals, that is, individuals actually see this insurance mechanism as optimal, then the establishment of formal safety net is likely to be ineffective. Further research is needed to identify what is the nature of this coping mechanism not only to understand the functioning of the household but also to understand which policy will be more effective.

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7 Appendix

A Tables

Table A.1: COHORT DIFFERENCES - MEN

	Before 40s	40s	50s	60s	70s	80s
Occupation:						
<i>Self-employed</i>	0.56	0.45	0.58	0.50	0.59	0.47
<i>Entrepreneur</i>	0.31	0.28	0.32	0.28	0.29	0.28
<i>Number of Employess</i>	3.40	2.71	1.86	1.67	2.10	1.29
<i>Wage employed</i>	0.22	0.42	0.39	0.47	0.35	0.24
<i>Public</i>	0.07	0.26	0.21	0.23	0.03	0.03
<i>Monthly Earnings US \$</i>	10.82	20.30	21.63	22.87	18.54	13
Human Capital:						
<i>Years of Schooling</i>	4.67	8.00	7.38	8.75	8.52	7.41
<i>Experience</i>	39.67	31.76	27.73	18.69	9.84	2.80
<i>Tenure</i>	20.81	18.37	16.91	11.74	6.47	2.38
<i>Father's Education</i>	3.56	4.82	5.37	6.84	7.91	8.04
<i>Mother's Education</i>	1.85	2.08	2.54	4.90	4.63	5.27
Demographics:						
<i>Female</i>	0.00	0.00	0.00	0.00	0.00	0.00
<i>Age</i>	71.32	57.29	48.48	39.05	29.36	20.49
<i>Age First Job</i>	23.52	22.98	20.55	20.86	19.56	17.34
<i>Age Entered Labour Force</i>	23.52	22.37	20.24	20.49	18.61	16.90
Observations	27	62	85	107	147	96

Source: Own calculations based on the Tanzania Household Urban Panel Survey.

Table A.2: COHORT DIFFERENCES - WOMEN

	Before 40s	40s	50s	60s	70s	80s
Occupation:						
<i>Self-employed</i>	0.76	0.63	0.65	0.65	0.65	0.45
<i>Entrepreneur</i>	0.23	0.13	0.27	0.20	0.12	0.07
<i>Number of Employess</i>	1.67	4.50	1.56	1.69	1.30	1.00
<i>Wage employed</i>	0.00	0.17	0.28	0.26	0.25	0.19
<i>Public</i>	0.00	0.17	0.18	0.19	0.10	0.03
<i>Monthly Earnings US \$</i>	8.75	12.36	12.98	12.01	13.72	9.27
Human Capital:						
<i>Years of Schooling</i>	3.24	4.13	5.52	7.26	8.13	8.05
<i>Experience</i>	25.41	21.20	22.86	14.92	8.82	2.83
<i>Tenure</i>	23.41	16.40	14.82	9.34	5.90	2.36
<i>Father's Education</i>	3.00	2.92	5.97	6.13	8.19	8.19
<i>Mother's Education</i>	1.69	1.26	3.32	3.74	4.92	5.95
Demographics:						
<i>Female</i>	1.00	1.00	1.00	1.00	1.00	1.00
<i>Age</i>	70.38	56.65	48.39	39.07	28.99	21.35
<i>Age First Job</i>	30.86	27.84	24.22	22.25	19.80	18.02
<i>Age Entered Labour Force</i>	30.86	27.84	23.91	21.29	19.06	17.48
Observations	17	30	65	139	181	102

Source: Own calculations based on the Tanzania Household Urban Panel Survey.

Table A.3: FIRST STAGE REGRESSION

	(1) Wage Employed	(2) Self-Employed
<i>Years of schooling</i>	-4614.863 (3917.851)	-4752.776*** (1673.152)
<i>Schooling Squared</i>	56453.260** (26734.614)	57069.539*** (16861.785)
<i>Experience</i>	3321.742*** (1067.864)	737.850 (748.695)
<i>Experience²</i>	-3230.133** (1317.490)	-1052.221 (1246.297)
<i>Age</i>	-1615.424 (2106.161)	2024.597* (938.008)
<i>Age Squared</i>	1424.913 (2016.297)	-1903.969** (853.889)
<i>Father's Education</i>	1081.604 (904.463)	1706.928 (1271.111)
<i>Mother's Education</i>	114.116 (929.856)	-1502.360 (1569.155)
<i>Public</i>	-3645.728 (17105.504)	
<i>Firm Size</i>	3288.182 (3054.614)	
Initial Training	22980.141** (11405.698)	
<i>Number of Employees</i>		1070.599** (521.083)
Entrepreneur		25905.297*** (9686.858)
Observations	462	437
R-squared	0.262	0.261

Source: Tanzania Household Urban Panel Survey.

Note: Dependent variable monthly earnings. Robust standard errors in parentheses. Standard errors are clustered at the household level. * $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.4: HAZARD OF LEAVING CURRENT STATUS - WITH POTENTIAL EARNINGS

	(1) Any Shock	(2) Negative Shock	(3) Positive Shock
<i>Shock Received by HH Member</i>	1.390*** (0.197)	1.311*** (0.318)	1.186*** (0.274)
<i>Proportion Employed Members</i>	0.362*** (0.136)	0.402*** (0.134)	0.377*** (0.137)
<i>Potential Earnings</i>	-0.017*** (0.002)	-0.017*** (0.002)	-0.017*** (0.002)
<i>Actual Earnings</i>	-0.010*** (0.002)	-0.010*** (0.002)	-0.010*** (0.002)
Observations	16407	16407	16407

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies. Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.5: HAZARD OF LEAVING CURRENT STATUS -WITH POTENTIAL EARNINGS

	(1) Any Shock	(2) Negative Shock	(3) Positive Shock
<i>Shock * Female</i>	1.643*** (0.263)	1.765*** (0.417)	1.384*** (0.365)
<i>Proportion Employed Members</i>	0.352*** (0.136)	0.395*** (0.134)	0.386*** (0.136)
<i>Potential Earnings</i>	-0.017*** (0.002)	-0.017*** (0.002)	-0.017*** (0.002)
<i>Actual Earnings</i>	-0.010*** (0.002)	-0.010*** (0.002)	-0.010*** (0.002)
Observations	16407	16407	16407

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies. Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.6: HAZARD OF MOVING IN & OUT OF THE LABOUR FORCE - WITH POTENTIAL EARNINGS

	INACTIVITY → EMPLOYMENT		EMPLOYMENT → INACTIVITY	
	(1) Negative Shock	(2) Positive Shock	(3) Negative Shock	(4) Positive Shock
Panel A: Men				
<i>Shock Received by HH Member</i>	-0.111 (0.836)	-0.726 (0.917)	- (.)	2.049 (1.791)
<i>Proportion Employed Members</i>	0.220 (0.458)	0.180 (0.424)	2.885*** (1.091)	3.153*** (1.108)
Panel B: Women				
<i>Shock Received by HH Member</i>	0.908 (1.95)	1.451** (2.67)	3.067* (2.20)	1.883* (2.15)
<i>Proportion Employed Members</i>	-0.118 (-0.40)	-0.167 (-0.57)	0.265 (0.56)	0.114 (0.23)

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies.

Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.7: HAZARD OF SWITCHING JOB-TYPE - WITH POTENTIAL EARNINGS

	SELF → WAGE EMPLOYMENT		WAGE → SELF-EMPLOYMENT	
	(1) Negative Shock	(2) Positive Shock	(3) Negative Shock	(4) Positive Shock
Panel A: Men				
<i>Shock Received by HH Member</i>	4.722*** (1.446)	-0.392 (1.082)	1.168 (1.106)	2.845*** (1.044)
<i>Proportion Employed Members</i>	0.475 (0.722)	0.495 (0.728)	0.078 (0.522)	0.037 (0.534)
Potential Earnings	-0.024*** (0.007)	-0.022*** (0.008)	-0.011** (0.005)	-0.011* (0.006)
<i>Actual Earnings</i>	-0.003 (0.007)	-0.003 (0.008)	-0.000 (0.006)	-0.000 (0.006)
Panel B: Women				
<i>Shock Received by HH Member</i>	1.270 (1.01)	1.266 (0.77)	3.624*** (4.26)	- (.)
<i>Proportion Employed Members</i>	0.886 (1.00)	0.880 (0.96)	0.489 (0.53)	0.648 (0.68)
Potential Earnings	-0.0415* (-2.56)	-0.0413* (-2.53)	-0.0165 (-0.83)	-0.0152 (-0.81)
<i>Actual Earnings</i>	-0.0324 (-0.98)	-0.0331 (-1.00)	-0.00205 (-0.06)	-0.00235 (-0.08)

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies.

Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.8: HAZARD OF LEAVING CURRENT STATUS - NOT INCLUDING PAY-CUT AND PAY-RAISE

	(1) Any Shock	(2) Negative Shock	(3) Positive Shock
<i>Shock Received by HH Member</i>	1.096*** (0.165)	1.054*** (0.261)	0.860*** (0.244)
<i>Proportion Employed Members</i>	0.393*** (0.133)	0.448*** (0.131)	0.414*** (0.134)
Observations	17536	17536	17536

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies.

Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.9: HAZARD OF LEAVING CURRENT STATUS - NOT INCLUDING PAY-CUT AND PAY-RAISE

	(1) Any Shock	(2) Negative Shock	(3) Positive Shock
<i>Shock * Female</i>	1.224*** (0.214)	1.037*** (0.351)	1.059*** (0.334)
<i>Proportion Employed Members</i>	0.400*** (0.132)	0.443*** (0.131)	0.426*** (0.132)
Observations	17536	17536	17536

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies.

Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.10: HAZARD OF MOVING IN & OUT OF THE LABOUR FORCE - NOT INCLUDING PAY-CUT AND PAY-RAISE

	INACTIVITY → EMPLOYMENT		EMPLOYMENT → INACTIVITY	
	(1) Negative Shock	(2) Positive Shock	(3) Negative Shock	(4) Positive Shock
Panel A: Men				
<i>Shock Received by HH Member</i>	0.049 (0.613)	-0.330 (0.744)	- (.)	1.279 (1.523)
<i>Proportion Employed Members</i>	0.227 (0.457)	0.149 (0.420)	2.349** (0.965)	2.627*** (0.973)
Panel B: Women				
<i>Shock Received by HH Member</i>	0.615 (1.31)	1.458** (2.64)	1.493 (1.65)	0.737 (0.97)
<i>Proportion Employed Members</i>	-0.0952 (-0.32)	-0.179 (-0.62)	0.494 (1.09)	0.411 (0.89)

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies.

Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.11: HAZARD OF SWITCHING JOB-TYPE - NOT INCLUDING PAY-CUT AND PAY-RAISE

	SELF → WAGE EMPLOYMENT		WAGE → SELF-EMPLOYMENT	
	(1) Negative Shock	(2) Positive Shock	(3) Negative Shock	(4) Positive Shock
Panel A: Men				
<i>Shock Received by HH Member</i>	2.634** (1.177)	1.181 (1.568)	0.873 (0.981)	1.837** (0.848)
<i>Proportion Employed Members</i>	0.749 (0.585)	0.681 (0.608)	-0.037 (0.528)	-0.075 (0.542)
Panel B: Women				
<i>Shock Received by HH Member</i>	1.413 (1.31)	1.702 (1.44)	2.373 (1.40)	- (.)
<i>Proportion Employed Members</i>	0.859 (1.09)	0.817 (1.01)	0.644 (0.70)	0.732 (0.79)

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies.

Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.12: HAZARD OF LEAVING CURRENT STATUS - WITH TOWN SPECIFIC SHOCKS

	(1) Any Shock	(2) Negative Shock	(3) Positive Shock
<i>Shock Received by HH Member</i>	1.490*** (0.189)	1.428*** (0.300)	1.329*** (0.263)
<i>Proportion Employed Members</i>	0.412*** (0.133)	0.458*** (0.132)	0.422*** (0.135)
Observations	17536	17536	17536

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies. Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.13: HAZARD OF LEAVING CURRENT STATUS - WITH TOWN SPECIFIC SHOCKS

	(1) Any Shock	(2) Negative Shock	(3) Positive Shock
<i>Shock * Female</i>	1.669*** (0.247)	1.723*** (0.380)	1.489*** (0.348)
<i>Proportion Employed Members</i>	0.409*** (0.133)	0.451*** (0.132)	0.438*** (0.133)
Observations	17536	17536	17536

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies. Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.14: HAZARD OF MOVING IN & OUT OF THE LABOUR FORCE - WITH TOWN SPECIFIC SHOCKS

	INACTIVITY → EMPLOYMENT		EMPLOYMENT → INACTIVITY	
	(1) Negative Shock	(2) Positive Shock	(3) Negative Shock	(4) Positive Shock
Panel A: Men				
<i>Shock Received by HH Member</i>	-0.216 (0.846)	-1.309 (1.442)	- (.)	- (.)
<i>Proportion Employed Members</i>	0.292 (0.476)	0.219 (0.435)	2.483** (0.989)	2.704*** (1.000)
Panel B: Women				
<i>Shock Received by HH Member</i>	0.947* (2.18)	1.606** (2.78)	2.775*** (3.62)	2.135** (3.08)
<i>Proportion Employed Members</i>	-0.110 (-0.36)	-0.167 (-0.55)	0.385 (0.86)	0.192 (0.41)

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies.

Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

Table A.15: HAZARD OF SWITCHING JOB-TYPE - WITH TOWN SPECIFIC SHOCKS

	SELF → WAGE EMPLOYMENT		WAGE → SELF-EMPLOYMENT	
	(1) Negative Shock	(2) Positive Shock	(3) Negative Shock	(4) Positive Shock
Panel A: Men				
<i>Shock Received by HH Member</i>	2.307* (1.228)	2.710 (2.260)	0.965 (1.105)	2.274** (0.958)
<i>Proportion Employed Members</i>	0.854 (0.591)	0.651 (0.638)	0.222 (0.547)	0.204 (0.563)
Panel B: Women				
<i>Shock Received by HH Member</i>	1.386 (1.09)	1.383 (0.92)	3.783*** (4.30)	- (.)
<i>Proportion Employed Members</i>	0.857 (1.12)	0.838 (1.08)	0.717 (0.76)	0.767 (0.77)

Source: Tanzania Household Urban Panel Survey.

Note: The results are conditional on shock duration, actual earnings, years of schooling, parental education, age, experience, tenure, gender, occupational dummies, town dummies and baseline hazard dummies.

Robust standard errors in parentheses. Standard errors are clustered at the household level.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$

B Figures

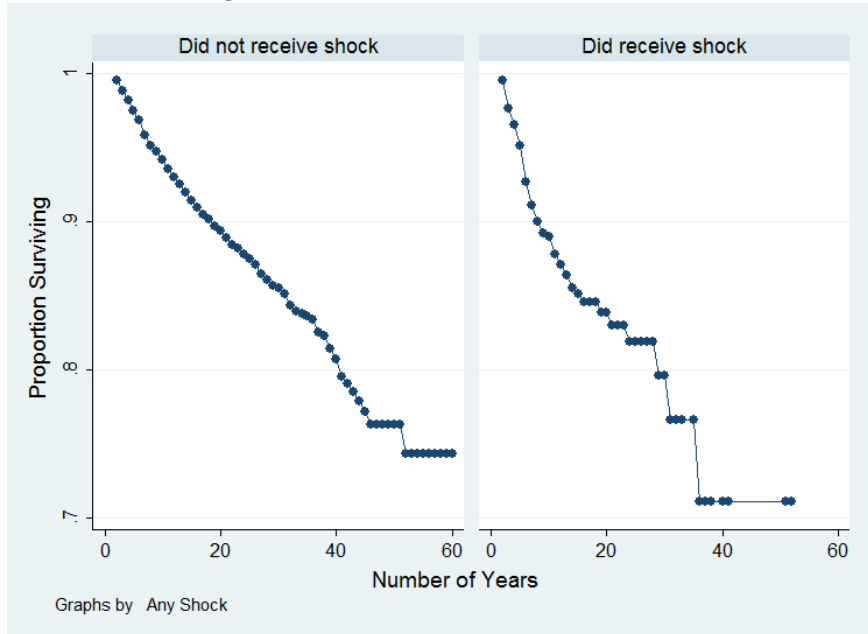
Figure A.1: PROPORTION OF SELF VS WAGE EMPLOYED OVER TIME



Source: Tanzania Household Urban Panel Survey.

Note: The figure displays the dynamics of self and wage employment over time.

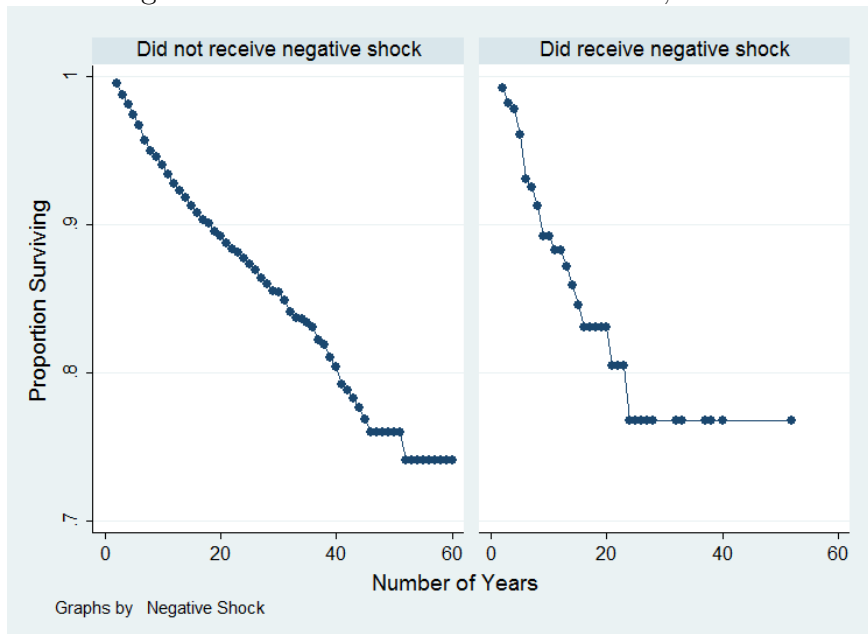
Figure A.2: KAPLAN-MEIER SURVIVOR, BY SHOCK RECEIVED



Source: Tanzania Household Urban Panel Survey.

Note: The figure shows the difference in Kaplan-Meier Survivor functions between individuals whose household member did and did not receive a labour market shock. The figure shows that individuals whose household member received a labour market shock have lower survival times.

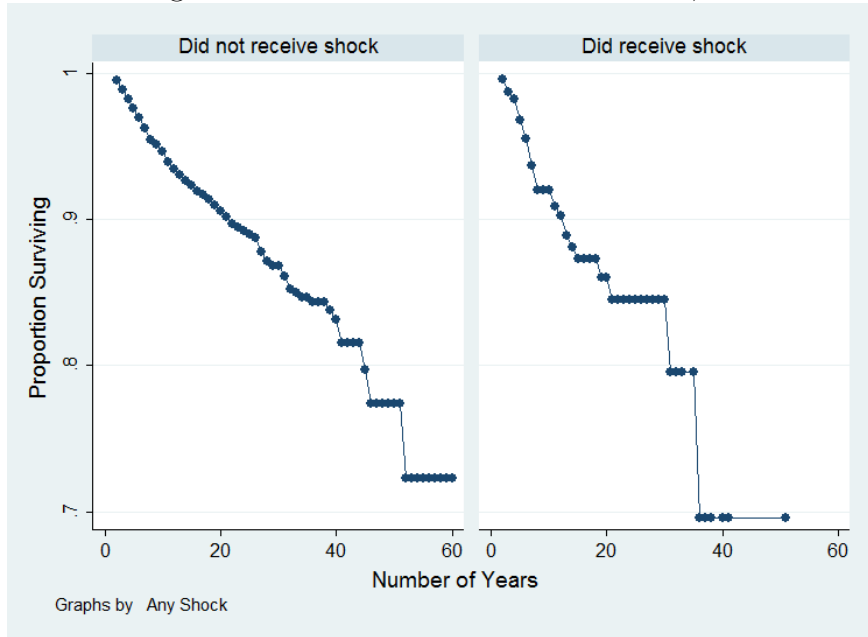
Figure A.3: KAPLAN-MEIER SURVIVOR, BY NEGATIVE SHOCK RECEIVED



Source: Tanzania Household Urban Panel Survey.

Note: The figure shows the difference in Kaplan-Meier Survivor functions between individuals whose household member did and did not receive a **negative** labour market shock. The figure shows that individuals whose household member received a negative labour market shock have lower survival times.

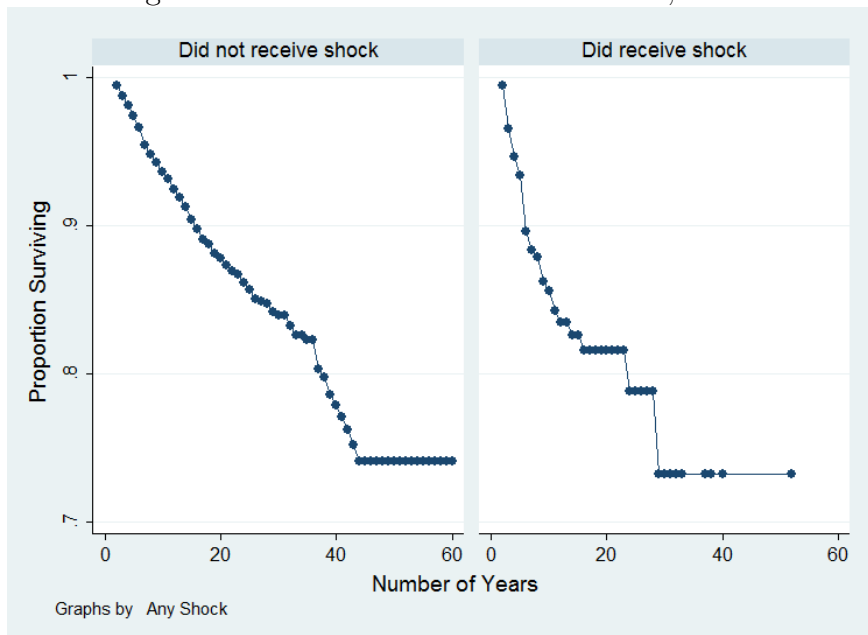
Figure A.4: KAPLAN-MEIER SURVIVOR, BY SHOCK RECEIVED - MEN



Source: Tanzania Household Urban Panel Survey.

Note: The figure shows the difference in Kaplan-Meier Survivor functions between individuals whose household member did and did not receive a labour market shock for the sample of men.

Figure A.5: KAPLAN-MEIER SURVIVOR, BY SHOCK RECEIVED - WOMEN



Source: Tanzania Household Urban Panel Survey.

Note: The figure shows the difference in Kaplan-Meier Survivor functions between individuals whose household member did and did not receive a labour market shock for the sample of women.