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**DO PENSIONS REDUCE THE INCENTIVE TO WORK?
EVIDENCE FROM EGYPT**

Mohamed Arouri and Cuong Viet Nguyen

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Send correspondence to:

Mohamed Arouri

Institution: Université d'Auvergne & EDHEC Business School, France

mohamed.arouri@udamail.fr

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Abstract

In this study, we investigate the impact of the receipt of contributory and social pensions on labor supply in Egypt using fixed-effects regressions and panel data from the Egypt Labor Market Panel Surveys in 2006 and 2012. We find that the receipt of contributory pension reduces the probability of working of people aged 15 to 60 as well as people above 60 years old. We also find a differential impact of contributory pensions. When living in a household with pensions, males, urban people, and those with high levels of education are less likely to work than females, rural people, and ones with low levels of education. Regarding the receipt of social pensions, it has no significant effects on the probability of working. A possible reason is that social pensions are remarkably lower than contributory pensions, and the small amount of social pensions is not enough to reduce the working incentive.

JEL Classification: H55, J14, J22, D04.

Keywords: Pension, social pension, impact evaluation, household welfare, labor supply, Egypt.

ملخص

نقوم في هذه الدراسة، بالتحقيق في الآثار المترتبة على استلام المعاشات المساهمة والاجتماعية على المعروض من العمالة في مصر باستخدام الآثار الثابتة الانحدارات والبيانات من المسح التتبعي لسوق العمل في مصر لعام 2006 وعام 2012. ونجد أن تلقي المعاش يقلل من احتمال عمل الناس الذين تتراوح أعمارهم بين 15 إلى 60 وكذلك الأشخاص فوق 60 سنة من العمر. نجد أيضا التأثير المتباين للمعاشات المساهمة. الأفراد ذو المعاشات التقاعدية، والذكور، في المناطق الحضرية، والذين لديهم مستويات عالية من التعليم هم أقل طلبا للعمل بالمقارنة بمقابلهم من الإناث، في المناطق الريفية، وتلك التي تحتوي على مستويات منخفضة من التعليم. وفيما يتعلق بتلقي المعاشات الاجتماعية، ليس له آثار كبيرة على احتمال العمل. أحد الأسباب المحتملة هو أن المعاشات الاجتماعية هي أقل بشكل ملحوظ من المعاشات المساهمة، وكمية صغيرة من المعاشات الاجتماعية لا يكفي للحد من حوافز العمل.

1. Introduction

Nowadays, most countries pursue pro-poor growth policies that not only promote economic growth but also provide support for low income people (e.g., Bhagwati, 1988; Kakwani and Ernesto, 2000; Perkins et al. 2001). One important policy of income redistribution is to provide pensions for the elderly, especially poor and disadvantaged elderly. Social protection for older people has received a great deal of attention because of the tendency for the aging of the population.

Although there is a broad consensus on the important role of pensions, empirical findings on their impact on welfare of recipients and their household members are mixed. Some studies reported that non-contributory or social pensions help the recipients increase welfare and reduce poverty (e.g., Bertranou and Grushka, 2002; Barrientos, 2003; Martinez, 2005). Téllez-Rojo et al. (2013) found that non-contributory pensions can increase nutrition intakes in rural Mexico. Similarly, Jensen and Richter (2003) found that the calorie intake and health care utilization decreased for pensioners in Russia when there was a drop in pensions. Pensions also help to decrease the working rate of elderly (Snyder and Evans, 2006; De Carvalho Filho, 2008b; Kassouf and Oliveira, 2012).¹ In contrast, several studies do not find significant effects of pensions and social allowances on household welfare (e.g., Jensen and Richter, 2003; Snyder and Evans, 2006; Puhani and Tabbert, 2013). Social pensions might not reach the poor. Several studies find that the poorest tend to receive less from social security programs than the middle and the richest (Howe and Longman, 1992; Castles and Mitchell, 1993; Barrientos and DeJong, 2006).

Recently, a rising concern about pensions has been their unintended effect on labor supply of working-age people. People, especially in developing countries, are often characterized by the cohabitation of a large array of family members, and family members have common income and consumption. The receipt of pensions can affect not only the elderly but also other family members. According to the neoclassical theory of labor supply, leisure is a normal good, and under an assumption of no credit constraints, an exogenous increase in income relaxes household budget constraints, increases leisure and reduces the working time of household members (e.g., see Cahuc and Zylberberg, 2004). The negative effect of social pensions as well as cash transfers have been found in several empirical studies (e.g., Sahn and Alderman; 1996; Bertrand et al., 2003; Dreze, 2005; Gertler et al., 2006; and Alzua et al., 2012). However, other studies do not find a significant effect of pensions on labor supply (e.g., Galasso, 2006; Skoufias and Di Maro, 2008; and Ardington et al., 2009).

The effect of pensions on labor supply of household members cannot be signed *a priori*. Its effect depends on different country contexts, and this requests more empirical studies to better understand the magnitude and mechanism of the effect of pensions on labor supply. This study aims to assess the effect of pensions, both contributory and social pensions, on labor supply of working-age people and old people in Egypt.

We think that Egypt offers an interesting country case to look at for different reasons. After its revolution, Egypt is currently going through several changes, in particular to its social pension and protection programs. Egypt is the largest country in the Arab world. It is a low-middle income country with per capita GDP of around 3,300\$US in 2013 (World Bank, 2014). Although, Egypt has achieved an annual economic growth rate of around 5 percent, it has not been very successful in poverty reduction. Poverty in Egypt is persistent with rate around 20 percent during the last two decades (El-Laithy, 2011). According to the World Bank (2014), the poverty rate in Egypt is 25.2 percent, and 75 percent of the poor are living in rural areas. In

¹ Related to cash transfers, a large number of studies found that cash transfers help receiving households decrease child labor, increase child schooling, and improve nutrition and health, and increase income, consumption, and reduce poverty (e.g., Hoddinott et al., 2000; Sadoulet et al., 2001; Jensen and Richter, 2003; Duflo, 2003; and Lloyd-Sherlock, 2006; Barrientos and DeJong, 2006; and De Carvalho Filho, 2008a).

an attempt to reduce poverty, the government of Egypt has provided several assistance programs, including social pensions for the poor and disadvantaged people (Korayem, 2013). Egypt is also a country with a tendency for an aging population (Saxena, 2010), and there is a need to improve pension schemes for the old people in the future.

In the literature, there have been no quantitative studies on the impact of pensions in Egypt. Several studies assess the social safety net. For example, Korayem (2013) finds that the food subsidy and social assistance programs do not reach the poor well. Most studies focus on the assessment of the coverage and targeting of social assistance and social insurance system in Egypt (e.g., World Bank, 2005; Loewe, 2005; El-Laithy, 2011; Selwaness, 2011; Egypt Network for Integrated Development, 2012; and Korayem, 2013).

The availability of panel data from the Egypt Labor Market Panel Surveys in 2006 and 2012 allows us to use panel techniques to estimate the impact of contributory and social pensions on labor supply of Egyptian households. The main advantage of panel data is that it can reduce estimation bias due to omitted time-invariant variables. We also examine whether the effect of pensions differs across different values of household and individual characteristics such as urbanity, gender and education. The findings of our paper are expected to be useful for policy implications on social assistance and social insurance policies in Egypt. These findings are also expected to be important for a wider group of emerging and transition Arab countries.

The remaining paper is structured as follows. The second section reviews the theoretical framework and literature of the effect of pensions on labor supply. The third section presents data sets and descriptive analysis. The fourth and fifth sections present the estimation method and empirical results of the impact of pensions on the labor supply of working-age people and older people. Finally, the sixth section presents the conclusions and policy recommendations.

2. Theoretical Framework and Literature Review

Pensions are expected to affect the labor market as well as households' welfare through several channels. The expected effects can be positive or negative, and the sign of the total impact is not known *a priori* and needs to be addressed empirically. Like for other cash transfer programs, the most direct impact of pension and social cash transfers is the positive effect on disposable income of households. With additional income, households can increase spending on consumption, both food and non-food items, for family members and their health condition may improve as well. This may also improve children's education as they may have better conditions and more support to attain school. In the long term, the improvement in human capital formation accumulation of poor household members can increase employment opportunities and productivity.

Regarding the labor supply of household members, pensions can have both direct and indirect effects. People are assumed to maximize their utility from consumption of goods and leisure given their budget constraints. According to the neoclassical theory of labor supply, leisure is a normal good, and under no credit constraints an exogenous increase in income will increase leisure and reduce the working time of people (e.g., see Cahuc and Zylberberg, 2004). Thus, like other cash transfer programs, pensions may create disincentive effects and decrease the labor supply of recipients and their household members. In the long-run, the recipients may prefer not to work and become more dependent on social assistance (Dreze, 2005; Sahn and Alderman; 1996). There are several empirical studies that find a negative effect of cash transfer programs on labor supply such as Gertler et al. (2006) and Alzua et al. (2012). Regarding pensions, recently Bertrand et al. (2003) shows that pension receipt reduces the labor market participation of working-age adults remarkably in South Africa.

However, the effect of pensions on labor supply is not necessarily negative. In developing countries, especially rural areas, households face credit constraints. Increased income might

not be used for consumption and leisure. It may be used to acquire productive inputs or to invest in productive assets or small sale activities, generating multipliers on the cash received (Sadoulet et al. 2001; Farrington and Slater 2006; Lloyd-Sherlock 2006). When households are devoid of reliable sources of credit, cash transfers may allow them to intensify or expand their production beyond a scale they would otherwise have been able to obtain (Sadoulet et al. 2001). As a result, household members can increase the labor supply and work efforts. Empirical evidence supports the multiplier-generating indirect effects of public transfers. Sadoulet et al. (2001) find short-run income multipliers in the range of 1.5-2.6 for cash transfers to compensate Mexican farm households for the anticipated negative price effects of trade liberalization on basic crops. Likewise, Devereux (2002) finds evidence that even small income transfers are often invested in income-generating activities, education, social networks, or acquisition of productive assets in three Southern African case studies. Several studies such as Galasso (2006) and Ardington et al. (2009) find a positive effect of cash transfers on labor supply of working-age people.

In the absence of effective collective arrangements to manage risk, poor households cannot afford a major setback, and so will often choose to manage their livelihoods so as to minimize their exposure to risk, even if this results in low average returns (Conway and Norton 2002). Cash transfers can simply be used for saving and asset accumulation, and if this happens there are no effects on labor supply. Several studies such as Parker and Skoufias (2000), Skoufias and Di Maro (2008) and Fizbein and Schady (2009) do not find significant effects of cash transfers on labor supply of adults.

3. Data set and Descriptive Analysis

3.1 Data set

The main data sets that we use in this study are sourced from the Egypt Labor Market Panel Surveys (ELMPS). These surveys were conducted by the Economic Research Forum (ERF) in cooperation with Egypt's Central Agency for Public Mobilization and Statistics (CAPMAS) since 1998. Until 2012, the survey has been conducted three times in 1998, 2006, and 2012. The 1998 ELMPS covered 4,816 households with 23,997 household members. The 2006 ELMPS followed these 4,816 households (who were visited in 1998), including households that split from these households, plus a new sample of 2,500 households. The final sample for the 2006 ELMPS is 8,351 households containing 37,140 individuals. The final sample for the 2012 ELMPS includes 12,060 households, consisting of 6,752 households from the 2006 sample, 3,308 new households that emerged from these households as a result of splits, and a refresher sample of 2,000 households. Of the 37,140 individuals interviewed in the 2006 ELMPS, 28,770 individuals were re-interviewed in 2012 (Assaad and Krafft, 2013).

In this study, we will use the panel data from the 2006 and the 2012 ELMPS. We do not use the 1998 ELMPS, since the number of households in the three round panel data is smaller. In addition, the 2006 and the 2012 ELMPS contain more comparable questions on pension and social allowances.

The ELMPSs contain detailed data on not only labor information of individuals but also on living conditions of their households and family members. Information includes parental background, education, housing conditions, durable ownership, access to services, residential mobility, migration and remittances, time use, marriage patterns and costs, fertility, women's decision making and empowerment, employment, savings and borrowing, household enterprises, farms and non-farm activities, and income. Especially, there is information on pension, including contributory (retirement) pension and social pension, and social assistances that households received during the past 12 months.

3.2 Descriptive analysis

The contributory pension has been implemented in Egypt since 1952. Workers contribute to a social insurance fund and receive their pension when retired. The contribution rate of workers and employees was adjusted several times in the past. Currently, the average contribution rate of employees is equal to 16.5 percent of their monthly wages, and the average rate of employers' contribution is 10 percent of the employees' monthly wages (Selwaness, 2012). The retirement age is now 60, but will be increased to 65 in 2027 (Selwaness, 2012). Social pensions or non-contributory pensions are provided for old people without contributory pensions. More specifically, the government of Egypt has provided the poor elderly with social pensions under the Law 112/1980, and other old people with the Sadat Pension scheme (UNFPA, 2015). In this study, both of the social pension schemes are included and defined as social pensions.

Figure 1 shows that the percentage of households who have at least a member receiving social pension was 6.7% in 2006, and decreased to 4.5% in 2012. The percentage of households receiving contributory pensions is higher and reaches 25.4% in 2006. This rate also decreased in 2012 to 21.8%.

Rural households are more likely to receive social pensions than urban households. This is expected as they have a lower living standard than the urban households. On the contrary, urban households tend to receive more contributory pensions than rural ones, since urban people are more likely to work in the formal sector than rural people.

Table 1 presents the percentage of households receiving contributory and social pensions by regions and household head characteristics. The rural Upper region has the highest proportion of receiving social pensions, while Greater Cairo and Alx, Sz Canal Cities have the highest proportion of receiving contributory pensions. Households with a female head and lower education head are more likely to receive both contributory and social pensions than those with male and high education head.

In Table 1, we also estimate the average monthly amount of pensions per receiving household in Egypt. The pension amount is estimated at the current price. The social pensions are substantially lower than the contributory pensions. In 2012, the average amount of the contributory pensions and the social pensions was 914 and 170 Egyptian pounds, respectively. The average amount of social pensions was higher for households in rural areas and households with female and low level of household's head education. However, urban people, male and people with high levels of education received higher pensions than rural people, female and people with low levels of education.

In this study, we will estimate the impact of pensions on employment and labor supply of individuals. In Tables 2 and 3, we present the estimates of outcome variables of households used in this study. We measure employment during the time reference of the past three months.² In addition to employment, we also look at the school enrolment of young people in households. It's possible that pensions received by old people can be used to cover the education cost or release young people from working, and as a result encouraging young people to attend school. Table 2 shows that the difference in school enrolment is not significantly different between households with and households without contributory pensions. In 2012, the school enrolment of people aged 15-22 was 15.6% and 12.1% in households with and households without contributory pensions, respectively. However, there is a large difference in

² In the data sets, there is information on the employment status during the past week as well as the employment status during the past three months. They are almost the same. Thus in this study, we use only the employment variables measured in the reference of the past three months.

the working rate between the two groups of households. People in households with contributory pensions are less likely to work than those in households without contributory pensions.

Table 3 shows that people aged 15-60 living in a household with social pensions tend to have a lower percentage of having a formal or wage job than people living in a household without social pensions. In 2012, old people (aged above 60) with social pension are less likely to work than those without social pension.

4. Estimation Method

Measuring the effect of a policy or a program is always a challenge. In our study, pensions are not randomized. There is a potential bias in estimating the effect of pensions, since receipt of pension and social assistance can be correlated with unobserved characteristics of individuals. We will use individual fixed-effects regressions to mitigate this endogeneity bias.

We measure the labor supply by the work status and the number of working hours per week. There are a large number of people who do not work and have zero or missing number of working hours. Thus, for the dependent variable of the number of working hours, we should use a Tobit model. However, a fixed-effects Tobit estimator is not available due to an incidental parameter problem in maximum likelihood methods (Wooldridge, 2001; Greene, 2004; Cameron and Trivedi, 2009). Two-part models are widely used to model a variable with a large number of zero values (Duan et al., 1983; Manning et al., 1987). We also use a panel data fixed-effects two-part model to remove the endogeneity bias due to time-invariant unobserved variables as follows:

$$Y_{ijt} = \beta_0 + Con_pension_{jt}\beta_1 + Soc_pension_{jt}\beta_2 + T_t\beta_3 + X_{ijt}\beta_4 + v_{ij} + u_{ijt}, \quad (1)$$

$$L_{ijt} = \delta_0 + Con_pension_{jt}\delta_1 + Soc_pension_{jt}\delta_2 + T_t\delta_3 + X_{ijt}\delta_4 + \varepsilon_{ij} + \pi_{ijt} \text{ for } Y_{ijt} > 0. \quad (2)$$

In equation (1), Y_{ijt} is a dummy variable indicating whether individual i in household j in year t is working or not. $Con_pension_{jt}$ and $Soc_pension_{jt}$ are two dummy variables indicating households' receipt of contributory pensions and social pensions, respectively. Members in the same households have the same value of these pension variables. T_t is a year dummy, which is equal 1 for 2012 and 0 for 2006. This dummy variable enables us to control for common macroeconomic changes over years. X_{ijt} is a vector of individual and household level explanatory variables. v_{ij} and u_{ijt} are unobserved variables that are time-invariant and time-variant, respectively. In equation (2), L_{ijt} is the working hours during a certain period of time of individual i in household j at time t . This equation is estimated using the sample of working people.

In addition to the dependent variable of work status, we also regress these variables 'having a job in the formal sector' and 'having a wage job' on pension variables and other control variables using the same model specification as equations (1) and (2).

As mentioned above, the main problem in estimating the effect of pensions is the endogeneity of pensions, which causes the estimates of pension biased. To address this bias, we use individual fixed-effects regression, which relies on the assumption that only time-invariant unobserved variables are correlated with the receipt of pensions. The time-invariant unobserved variables, v_{ij} and ε_{ij} , are eliminated in the fixed-effects regression, and the remaining errors, u_{ijt} and π_{ijt} , are uncorrelated with the receipt of pensions. As a result, the fixed-effects regression can produce unbiased estimates of the receipt of pensions.³ Although

³ To present the basic idea of the fixed-effects estimator, assume that we want to estimate the follow model:

there is no guarantee that the fixed-effects regression fully addresses the endogeneity bias, we expect that the bias would be small after time-invariant variables and unobserved explanatory variables are controlled for.

We tend to use the more exogenous explanatory variables, which should not be affected by the receipt of pensions (Heckman et al. 1999; Angrist and Pischke, 2008). The explanatory variables X include both household-level and individual-level variables. Household variables consist of household size, proportion of children and elderly people, children's age in months, age, gender and education of household heads (see Table A.1 in Appendix for summary statistics of these variables). The individual-level variables include schooling years. Variables that are time-invariant such as gender, education, and geographic variables are eliminated in fixed-effects regressions and not presented in regression results.

Finally, it should be noted that we estimate equation (1) using a linear probability fixed-effects regression. Binary dependent variables are often estimated using a logit or probit model. However, fixed-effects probit estimators are not available, while fixed-effects logit estimators are not efficient. In cases of no available non-linear probability models, linear probability models are widely employed (e.g., Angrist, 2001; Angrist and Krueger, 2001).

5. Empirical Findings

5.1 The impact on labor supply

Table 4 presents the fixed-effects regression of employment variables of people aged 15-60 on dummy variables indicating whether households receiving contributory pensions and social pensions. Since most of people receiving pensions are 60 years old and older, the regressions in Table 4 reflect the spill-over effects of pensions on younger people. We consider four employment variables: having worked during the past three months, having a job in the formal sector, having a wage job and the number of working hours per week of working people.

Results in column 1 show that receipt of contributory pension tends to reduce the probability of working by 0.066, equivalent to 12% of the mean of the proportion of working people (55%). Having a member receiving contributory pension also reduces the probability of having formal or wage jobs of other members, but does not affect the number of working hours per week. Overall, our findings seem to go in favor of the hypothesis of disincentive effects of cash transfers. Bertrand et al. (2003) reported similar results for the case of South Africa. Elderly Egyptians who receive contributory pensions may transfer a part of the money to their other family members giving more to the needy ones. This seems to produce two different effects. First, the extra income augments the consumption of leisure and reduces the work search effort. Second, the family safety net allowed by intra family distribution of cash transfers from elderly produces disincentive effects exactly like the public safety nets do. If the needy family members who receive more from elderly work more and increase their income, the elderly may decrease the amount of money they transfer to them. Those two effects reduce the labor supply of the household's members.

$$y_{it} = \alpha + x_{it}\beta + u_i + \varepsilon_{it}. \quad (\text{A.1})$$

The key assumption for the fixed-effects estimator is that x_{it} is correlated with u_i but not ε_{it} . Firstly, we take the average of observations across time t , and have the average model as follows:

$$\bar{y}_{it} = \alpha + \bar{x}_{it}\beta + u_i + \bar{\varepsilon}_{it}, \text{ where } \bar{y}_{it} = \frac{1}{T} \sum_{t=1}^T y_{it}; \bar{x}_{it} = \frac{1}{T} \sum_{t=1}^T x_{it}; \text{ and } \bar{\varepsilon}_{it} = \frac{1}{T} \sum_{t=1}^T \varepsilon_{it}.$$

Then we compute the difference between the original and the average model to have the following model:

$$(y_{it} - \bar{y}_{it}) = (x_{it} - \bar{x}_{it})\beta + (\varepsilon_{it} - \bar{\varepsilon}_{it}). \quad (\text{A.2})$$

Now u_i is eliminated, and model (A.2) can be estimated without bias, since its error is not correlated with x .

There are several empirical studies which find a positive effect of cash transfers on children's education (e.g., Barrientos and DeJong, 2006; Duflo, 2003; and De Carvalho Filho, 2008a). If pensions can reduce the work burden for young people and encourage them to attend school, they can have a long-term effect on human capital and income. However, the last column of Table 1 shows no significant effects of the receipt of pensions on education enrolment of young people aged 15-22.

There are no significant effects of the social pensions on employment as well as education. A possible reason is that social pensions are remarkably lower than contributory pensions. A small amount of social pensions is not enough to decrease the working incentive of recipients.

For elderly from 60 years old, Table 5 shows that having contributory pensions decreases their probability of working by 0.082, equivalent to 50 percent of the average proportion of the working people. The effect of pensions on labor market participation is higher for elderly than for young Egyptians. Old people with pensions are less likely to have a wage job than those without pensions.

The effect of the receipt of social pensions is negative and significant in the regressions of the probability of having a formal job and the probability of having a wage job. However, the effect of the receipt of social pensions is not significant in the regression of the probability of working and the regression of the number of working hours.

5.2 Heterogeneous impact of pension

Previous studies show the heterogeneous effect of cash transfers on labor supply (e.g., Moffitt, 2002; 2014). An important issue is whether there is a differential effect of pensions on labor supply in Egypt. We include interactions between pension variables and other individual characteristics in regressions of the probability of working and the regression of the probability of having wage jobs. The results of the interactions are very similar in the regression of the two dependent variables. In this section, we use results from the regressions of the probability of working for interpretation. Table 6 presents the coefficients of pensions and interaction terms in regressions of the probability of working. In these tables, we do not report the coefficients of control variables. The full regression results are presented in Tables A.2 and A.3 in Appendix.

Table 6 shows a differential impact of pensions on employment. Several empirical studies find the effect of cash transfers on labor supply differs between men and women (e.g., Bertrand et al., 2003; Maluccio and Flores, 2005; Abel, 2014; Yang, 2015). In the case of Egypt, we find that the effect of the receipt of contributory pensions on the probability of working is higher for men than for women. One possible explanation is that of cultural reasons -- Egyptian women have a lower bargaining power than men living in the same household in particular when those men are highly educated. Moreover, women may show more altruism towards other family members than men. Bertrand et al. (2003) reached similar findings in the case of South Africa.

Table 6 also shows that people with higher education levels are significantly less likely to participate in the labor market when they live with a pensioner than people with lower education levels. The effect is also higher for urban people than for rural ones. This implies that when receiving pensions individuals in high-income households are less likely to work than individuals in other households. It's possible that high-income people derive higher utility from leisure than low-income people. At high levels of income, the elasticity of labor supply to income is larger. In addition, people with high levels of education in urban areas are more likely to have a wage job instead of self-employed and home-production work. Thus, the labor-increasing effect of pensions through promotion of home production if any is smaller in urban areas than in rural areas.

6. Conclusions

This study explores the patterns of contributory and social pensions in Egypt and investigates their effects on the labor supply of households. Data are sourced from the Egypt Labor Market Panel Surveys in 2006 and 2012. Our empirical findings show that the receipt of contributory pensions reduces the probability of working of people aged 15 to 60 as well as people above 60 years old. We also find a differential impact of contributory pensions. When living in a household with pensions, male, urban people, and those with high levels of education are less likely to work than female, rural people, and ones with low levels of education. Regarding the receipt of social pensions, it has no significant effects on the work status of young and old people. A possible reason is that social pensions are remarkably lower than contributory pensions, and the small amount of social pensions is not enough to decrease the working incentive.

Taken together, our findings suggest that there might be intra-household redistribution of pensions among household members, and a part of the money ends in the hand of non-targeted members. This seems to create distinctive effects and leads to a reduction in the participation of household's members to the labor market. The decrease in labor supply can reduce the total income and mitigate the poverty-reducing effect of pensions, especially for the case of Egypt – a country with a low rate of labor force participation. To build more effective pension and social protection policies, Egyptian policymakers should take into account intra household redistribution of the transferred money as well as the unintended effects of the policies on labor supply.

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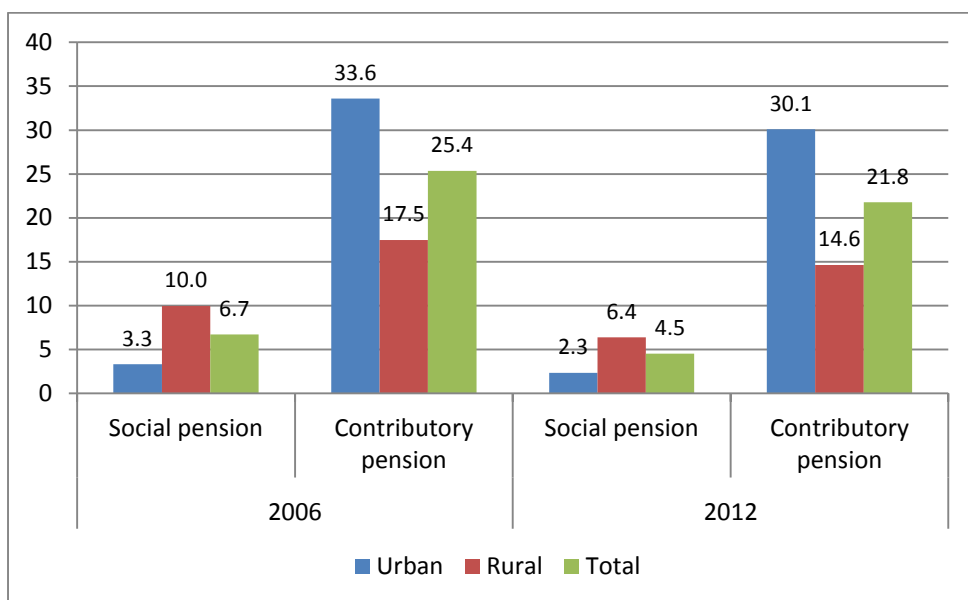
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Figure 1: The Percentage of Households Receiving Social Pension and Social Allowance in Egypt During 2006-2012



Source: Authors' estimation from the 2006 and 2012 ELMPSs.

Table 1: Households Receiving Pensions and Allowances in Egypt

Regions	% households receiving contributory pension		Average contributory pension per receiving household (Egyptian pound/month)		% households receiving social pension		Average social pension per receiving household (Egyptian pound/month)	
	Year 2006	Year 2012	Year 2006	Year 2012	Year 2006	Year 2012	Year 2006	Year 2012
<i>Regions</i>								
Greater Cairo	36.13	34.39	659.4	1136.5	1.98	1.80	71.3	161.5
Alx, Sz C. Cities	37.16	32.68	562.6	1077.0	0.85	1.66	163.9	174.8
Urban Lower	30.16	24.28	475.9	878.1	5.52	3.30	70.1	199.3
Urban Upper	31.11	22.36	615.0	904.7	4.61	3.23	67.3	162.0
Rural Lower	16.46	16.25	364.4	683.6	8.70	5.39	90.8	155.2
Rural Upper	18.91	12.51	252.4	651.4	11.75	7.84	71.1	179.7
<i>Gender of household heads</i>								
Male	19.42	15.16	553.1	1015.7	4.64	3.22	82.1	172.6
Female	50.82	49.65	393.4	783.3	15.53	9.97	76.0	165.5
<i>Education level of household heads</i>								
Illiterate	28.29	27.46	303.1	622.6	13.69	11.14	80.4	170.9
Read & Write	29.68	27.15	398.3	768.0	4.34	2.51	69.4	161.4
Below intermediate	27.60	25.33	512.5	853.7	3.68	2.06	81.9	162.6
Intermediate	19.97	14.51	609.7	1140.8	2.55	1.74	80.3	160.1
University & Higher	22.25	18.99	981.5	1546.5	1.30	0.56	64.9	213.6
All Egypt	25.36	21.78	492.6	913.9	6.70	4.51	79.4	169.6

Source: Authors' estimation from the 2006 and 2012 ELMPSs

Table 2: Outcome Variables of Households with and Without Contributory Pensions

Outcome variables	2006		2012	
	With contributory pensions	Without contributory pensions	With contributory pensions	Without contributory pensions
<i>People aged 15-22</i>				
Currently attending school (yes=1, no=0)	15.78	14.10	15.58	12.23
<i>People aged 15-60</i>				
Having worked (yes=1, no=0)	54.81	67.64	47.72	61.82
Having job in the formal sector (yes=1, no=0)	21.35	24.58	20.34	24.74
Having wage job (yes=1, no=0)	32.03	35.78	32.63	39.62
Number of working hours per week	22.60	28.11	17.83	23.37
<i>People above 60 years old</i>				
Having worked (yes=1, no=0)	16.96	42.21	13.35	27.18
Having job in the formal sector (yes=1, no=0)	3.90	5.52	2.94	3.80
Having wage job (yes=1, no=0)	2.08	3.73	2.75	4.50
Number of working hours per week	5.47	15.97	5.05	11.69

Source: Authors' estimation from the 2006 and 2012 ELMPSs.

Table 3: Outcome Variables of Households with and without Social Pensions

Outcome variables	2006		2012	
	With social pension	Without social pension	With social pension	Without social pension
<i>People aged 15-22</i>				
Currently attending school (yes=1, no=0)	11.90	14.67	12.32	12.86
<i>People aged 15-60</i>				
Having worked (yes=1, no=0)	68.22	64.48	57.81	59.47
Having job in the formal sector (yes=1, no=0)	12.20	24.67	12.34	24.51
Having wage job (yes=1, no=0)	27.71	35.44	30.84	38.76
Number of working hours per week	27.41	26.81	20.44	22.44
<i>People above 60 years old</i>				
Having worked (yes=1, no=0)	26.95	26.78	13.53	19.95
Having job in the formal sector (yes=1, no=0)	1.13	5.18	0.45	3.75
Having wage job (yes=1, no=0)	1.70	2.92	1.30	3.82
Number of working hours per week	8.90	9.69	5.10	8.22

Source: Authors' estimation from the 2006 and 2012 ELMPSs.

Table 4: Fixed-Effects Regression of Labor Supply of People Aged 15-60

Explanatory variables	Aged 15-60			Log of number of working hours per week	Aged 15-22 Currently attending school (yes=1, no=0)
	Having worked (yes=1, no=0)	Having job in the formal sector (yes=1, no=0)	Having wage job (yes=1, no=0)		
Households receiving contributory pension	-0.0660*** (0.0149)	-0.0785*** (0.0113)	-0.0907*** (0.0127)	-0.0165 (0.0251)	-0.0024 (0.0184)
Households receiving social pension	-0.0160 (0.0204)	-0.0205 (0.0135)	0.0017 (0.0147)	0.0119 (0.0351)	-0.0008 (0.0256)
Number of schooling years	0.0067* (0.0039)	0.0078** (0.0038)	0.0053 (0.0042)	0.0115 (0.0081)	-0.0813*** (0.0070)
Household size	0.0114*** (0.0025)	0.0013 (0.0018)	-0.0027 (0.0023)	-0.0004 (0.0052)	-0.0124*** (0.0036)
Proportion of children below 15 in household	-0.0089 (0.0295)	0.0342* (0.0197)	-0.0075 (0.0232)	0.1031** (0.0466)	0.3543*** (0.0400)
Proportion of elderly above 60 in household	-0.2035*** (0.0423)	-0.1510*** (0.0332)	-0.1768*** (0.0353)	-0.0052 (0.1100)	-0.1391* (0.0743)
Proportion of female members	0.0952** (0.0399)	0.0501* (0.0282)	0.0475 (0.0338)	-0.0437 (0.0703)	0.0836* (0.0435)
Head is male (male=1, female=0)	0.0213 (0.0219)	-0.0197* (0.0118)	-0.0450*** (0.0166)	0.0512 (0.0391)	0.0792*** (0.0220)
Household head aged below 31	Reference				
Household head aged 31-40	-0.0572*** (0.0165)	-0.0256** (0.0120)	-0.0493*** (0.0144)	-0.0387 (0.0236)	0.1057*** (0.0171)
Household head aged 41-50	-0.0831*** (0.0197)	-0.0461*** (0.0137)	-0.0644*** (0.0172)	-0.0176 (0.0296)	0.1228*** (0.0222)
Household head aged 51-60	-0.0803*** (0.0221)	-0.0370** (0.0159)	-0.0447** (0.0194)	-0.0056 (0.0381)	0.1148*** (0.0227)
Household head aged 61+	-0.0777*** (0.0280)	-0.0592*** (0.0196)	-0.0451* (0.0233)	-0.0186 (0.0482)	0.0816** (0.0326)
Number of schooling years of head	0.0022 (0.0021)	0.0014 (0.0017)	0.0031* (0.0017)	-0.0061 (0.0038)	-0.0080*** (0.0022)
Constant	-0.0771*** (0.0065)	-0.0008 (0.0047)	0.0126** (0.0056)	-0.0869*** (0.0102)	-0.2464*** (0.0131)
Dummy year 2012 (1 for 2012, 0 for 2006)	0.5933*** (0.0455)	0.2171*** (0.0371)	0.4023*** (0.0411)	3.7281*** (0.0840)	0.9860*** (0.0760)
Observations	30724	30724	30724	17236	11740
Number of individuals	15362	15362	15362	10829	5870
R-squared	0.05	0.04	0.03	0.04	0.49

Notes: Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation based on the 2006 and 2012 ELMPSs.

Table 5: Fixed-Effects Regression of Labor Supply of People Aged Above 60

Explanatory variables	Having worked (yes=1, no=0)	Having job in the formal sector (yes=1, no=0)	Having wage job (yes=1, no=0)	Number of working hours per week
Households receiving contributory pension	-0.0821** (0.0365)	-0.0277 (0.0302)	-0.0395*** (0.0152)	-0.0152 (0.2575)
Households receiving social pension	-0.0480 (0.0377)	-0.0224* (0.0135)	-0.0212* (0.0110)	0.0669 (0.1690)
Number of schooling years	0.0041 (0.0125)	0.0040 (0.0073)	0.0073 (0.0071)	0.4477* (0.2610)
Household size	0.0154 (0.0095)	-0.0088* (0.0052)	-0.0063 (0.0047)	0.0049 (0.0378)
Proportion of children below 15 in household	-0.3081*** (0.1140)	-0.1409*** (0.0526)	-0.0969** (0.0484)	-0.5571 (0.5834)
Proportion of elderly above 15 in household	0.0003 (0.0961)	-0.1828*** (0.0700)	-0.1295* (0.0748)	-0.7125 (0.4743)
Proportion of female members	0.0333 (0.1329)	-0.0162 (0.0450)	0.1740* (0.0995)	0.9515 (0.8055)
Head is male (male=1, female=0)	0.0539 (0.0767)	-0.0215 (0.0236)	0.0488 (0.0368)	-0.2761 (0.4292)
Household head aged 30 and younger	Reference			
Household head aged 31-40	-0.0826 (0.1112)	0.0326** (0.0165)	0.0293* (0.0171)	-2.4613*** (0.7577)
Household head aged 41-50	-0.0706 (0.1144)	0.0246 (0.0186)	0.0276* (0.0160)	-1.6774* (0.9311)
Household head aged 51-60	0.0376 (0.1249)	0.0164 (0.0276)	0.0350 (0.0228)	-4.9895* (2.6737)
Household head aged 61+	-0.0014 (0.1340)	0.0753* (0.0389)	0.0548 (0.0400)	-5.1807* (2.7716)
Number of schooling years of head	-0.0081 (0.0067)	0.0005 (0.0016)	0.0002 (0.0014)	-0.4058* (0.2459)
Constant	0.3402* (0.1807)	0.1642*** (0.0610)	-0.0434 (0.0704)	-0.2362** (0.1014)
Dummy year 2012 (1 for 2012, 0 for 2006)	-0.2182*** (0.0176)	-0.0353*** (0.0081)	-0.0243*** (0.0076)	8.8947*** (2.4329)
Observations	2872	2872	2872	496
Number of individuals	1436	1436	1436	379
R-squared	0.21	0.08	0.07	0.28

Notes: Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation based on the 2006 and 2012 ELMPSs.

Table 6: Fixed-Effects Regression of Working Status with Interactions

Explanatory variables	People aged 15-60			People aged 60 and older		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Households receiving contributory pension	0.0132 (0.0208)	-0.0112 (0.0240)	-0.0479** (0.0191)	0.0145 (0.0436)	-0.0320 (0.0403)	-0.0174 (0.0490)
Households receiving social pension	0.0107 (0.0319)	0.0131 (0.0301)	-0.0056 (0.0222)	0.0037 (0.0431)	-0.0289 (0.0393)	-0.0138 (0.0431)
Households receiving contributory pension \times male	-0.1699*** (0.0269)			-0.2272*** (0.0712)		
Hh. receiving social pension \times male	-0.0543 (0.0368)			-0.1237 (0.0869)		
Hh. receiving contributory pension \times Number of schooling years		-0.0072*** (0.0024)			-0.0234*** (0.0074)	
Hh. receiving social pension \times Number of schooling years		-0.0054 (0.0036)			-0.0129 (0.0193)	
Hh. receiving contributory pension \times urban			-0.0491* (0.0267)			-0.2062*** (0.0605)
Hh. receiving social pension \times urban			-0.0792* (0.0450)			-0.1892*** (0.0635)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.5966*** (0.0456)	0.5847*** (0.0452)	0.5944*** (0.0456)	0.3488* (0.1808)	0.3028* (0.1771)	0.3706** (0.1774)
Observations	30724	30724	30724	2872	2872	2872
Number of individuals	15362	15362	15362	1436	1436	1436
Within R-squared	0.06	0.06	0.05	0.22	0.21	0.21

Notes: Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation based on the 2006 and 2012 ELMPSs.

Appendices

Table A1: Summary Statistics of Explanatory Variables

Variables	Type	2006		2012	
		Mean	Std. Dev.	Mean	Std. Dev.
Individual-level variables					
Age	Discrete	36.40	15.96	38.56	17.49
Male (male=1, female=0)	Binary	0.482	0.500	0.492	0.500
Number of schooling years	Discrete	7.295	5.598	8.067	5.388
Household-level variables					
Household size	Discrete	5.747	2.924	4.812	2.319
Proportion of children below 15 in household	Continuous	0.250	0.214	0.236	0.227
Proportion of elderly above 15 in household	Continuous	0.095	0.194	0.130	0.250
Proportion of female members	Continuous	0.497	0.180	0.502	0.196
Head is male (male=1, female=0)	Binary	0.849	0.359	0.825	0.380
Household head aged below 31	Binary	0.071	0.257	0.079	0.270
Household head aged 31-40	Binary	0.155	0.362	0.152	0.359
Household head aged 41-50	Binary	0.277	0.447	0.252	0.434
Household head aged 51-60	Binary	0.288	0.453	0.275	0.446
Household head aged 61+	Binary	0.209	0.407	0.242	0.428
Number of schooling years of head	Discrete	6.212	5.968	7.333	5.757
Urban (urban=1, rural=0)	Binary	0.355	0.479	0.351	0.477

Source: authors' estimation based on the 2012 ELMPS

Table A2: Regressions with Interactions: Sample of People Aged 15-60

Explanatory variables	Having worked (yes=1, no=0)			Having wage job (yes=1, no=0)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Households receiving contributory pension	0.0132 (0.0208)	-0.0112 (0.0240)	-0.0479** (0.0191)	0.0021 (0.0115)	-0.0429*** (0.0163)	-0.0759*** (0.0156)
Households receiving social pension	0.0107 (0.0319)	0.0131 (0.0301)	-0.0056 (0.0222)	0.0297** (0.0119)	0.0205 (0.0167)	0.0077 (0.0159)
Households receiving contributory pension × male	-0.1699*** (0.0269)			-0.1990*** (0.0247)		
Households receiving social pension × male	-0.0543 (0.0368)			-0.0561* (0.0311)		
Hh. receiving contribute. pension × Number of schooling years		-0.0072*** (0.0024)			-0.0062*** (0.0021)	
Hh. receiving social pension × Number of schooling years		-0.0054 (0.0036)			-0.0033 (0.0029)	
Households receiving contributory pension × urban			-0.0491* (0.0267)			-0.0398 (0.0253)
Households receiving social pension × urban			-0.0792* (0.0450)			-0.0395 (0.0396)
Number of schooling years	0.0065* (0.0039)	0.0087** (0.0039)	0.0067* (0.0039)	0.0052 (0.0042)	0.0070* (0.0042)	0.0053 (0.0042)
Household size	0.0113*** (0.0025)	0.0115*** (0.0025)	0.0111*** (0.0025)	-0.0028 (0.0023)	-0.0026 (0.0023)	-0.0029 (0.0023)
Proportion of children below 15 in household	-0.0065 (0.0296)	-0.0115 (0.0295)	-0.0088 (0.0295)	-0.0046 (0.0231)	-0.0095 (0.0232)	-0.0075 (0.0232)
Proportion of elderly above 15 in household	-0.1975*** (0.0418)	-0.1949*** (0.0416)	-0.1976*** (0.0419)	-0.1698*** (0.0344)	-0.1696*** (0.0344)	-0.1719*** (0.0347)
Proportion of female members	0.0782* (0.0400)	0.0910** (0.0400)	0.0944** (0.0400)	0.0276 (0.0338)	0.0438 (0.0340)	0.0467 (0.0338)
Head is male (male=1, female=0)	0.0173 (0.0219)	0.0189 (0.0219)	0.0203 (0.0219)	-0.0495*** (0.0168)	-0.0470*** (0.0167)	-0.0457*** (0.0166)
Household head aged below 31	Reference					
Household head aged 31-40	-0.0551*** (0.0165)	-0.0574*** (0.0165)	-0.0565*** (0.0164)	-0.0469*** (0.0144)	-0.0493*** (0.0143)	-0.0487*** (0.0143)
Household head aged 41-50	-0.0785*** (0.0198)	-0.0831*** (0.0197)	-0.0821*** (0.0197)	-0.0590*** (0.0173)	-0.0642*** (0.0172)	-0.0635*** (0.0171)
Household head aged 51-60	-0.0731*** (0.0221)	-0.0791*** (0.0220)	-0.0780*** (0.0220)	-0.0364* (0.0196)	-0.0435** (0.0194)	-0.0431** (0.0193)
Household head aged 61+	-0.0675** (0.0280)	-0.0777*** (0.0280)	-0.0767*** (0.0280)	-0.0333 (0.0233)	-0.0448* (0.0233)	-0.0446* (0.0233)
Number of schooling years of head	0.0024 (0.0021)	0.0018 (0.0021)	0.0023 (0.0021)	0.0034* (0.0018)	0.0027 (0.0018)	0.0032* (0.0017)
year2012	-0.0788*** (0.0065)	-0.0780*** (0.0065)	-0.0775*** (0.0065)	0.0107* (0.0057)	0.0119** (0.0056)	0.0125** (0.0056)
Constant	0.5966*** (0.0456)	0.5847*** (0.0452)	0.5944*** (0.0456)	0.4061*** (0.0413)	0.3953*** (0.0409)	0.4034*** (0.0412)
Observations	30724	30724	30724	30724	30724	30724
Number of individuals	15362	15362	15362	15362	15362	15362
R-squared	0.06	0.06	0.05	0.04	0.03	0.03

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation based on the 2012 ELMPS.

Table A3: Regressions with Interactions: Sample of People Aged 60 and Older

Explanatory variables	Having worked (yes=1, no=0)			Having wage job (yes=1, no=0)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Households receiving contributory pension	0.0145 (0.0436)	-0.0320 (0.0403)	-0.0174 (0.0490)	-0.0012 (0.0044)	-0.0159 (0.0150)	-0.0362* (0.0199)
Households receiving social pension	0.0037 (0.0431)	-0.0289 (0.0393)	-0.0138 (0.0431)	-0.0068 (0.0048)	-0.0090 (0.0119)	-0.0186 (0.0128)
Households receiving contributory pension × male	-0.2272*** (0.0712)			-0.0911*** (0.0335)		
Households receiving social pension × male	-0.1237 (0.0869)			-0.0316 (0.0294)		
Hh. receiving contribu. pension × Number of schooling years		-0.0234*** (0.0074)			-0.0112 (0.0072)	
Hh. receiving social pension × Number of schooling years		-0.0129 (0.0193)			-0.0096* (0.0056)	
Households receiving contributory pension × urban			-0.2062*** (0.0605)			-0.0108 (0.0285)
Households receiving social pension × urban			-0.1892*** (0.0635)			-0.0178 (0.0189)
Number of schooling years	0.0026 (0.0126)	0.0197 (0.0141)	0.0024 (0.0125)	0.0069 (0.0072)	0.0150* (0.0078)	0.0072 (0.0071)
Household size	0.0141 (0.0095)	-0.0151 (0.0096)	0.0146 (0.0096)	-0.0068 (0.0047)	-0.0064 (0.0047)	-0.0063 (0.0047)
Proportion of children below 15 in household	-0.3050*** (0.1129)	-0.3050*** (0.1134)	-0.3157*** (0.1132)	-0.0963** (0.0489)	-0.0952** (0.0485)	-0.0977** (0.0487)
Proportion of elderly above 15 in household	-0.0080 (0.0964)	-0.0000 (0.0972)	-0.0101 (0.0963)	-0.1330* (0.0749)	-0.1302* (0.0754)	-0.1300* (0.0749)
Proportion of female members	0.0280 (0.1333)	0.0364 (0.1325)	0.0283 (0.1330)	0.1730* (0.0996)	0.1756* (0.0996)	0.1737* (0.0996)
Head is male (male=1, female=0)	0.0525 (0.0781)	0.0546 (0.0767)	0.0534 (0.0767)	0.0488 (0.0369)	0.0493 (0.0368)	0.0486 (0.0367)
Household head aged below 31	Reference					
Household head aged 31-40	-0.0846 (0.1085)	-0.0738 (0.1075)	-0.0745 (0.1070)	0.0278 (0.0180)	0.0330** (0.0157)	0.0296* (0.0170)
Household head aged 41-50	-0.0743 (0.1128)	-0.0732 (0.1113)	-0.0630 (0.1101)	0.0240 (0.0169)	0.0254* (0.0148)	0.0282* (0.0159)
Household head aged 51-60	0.0421 (0.1230)	0.0506 (0.1213)	0.0573 (0.1209)	0.0349 (0.0233)	0.0401* (0.0211)	0.0362 (0.0228)
Household head aged 61+	0.0016 (0.1342)	0.0159 (0.1306)	0.0211 (0.1309)	0.0543 (0.0402)	0.0627 (0.0388)	0.0562 (0.0403)
Number of schooling years of head	-0.0067 (0.0068)	-0.0067 (0.0068)	-0.0074 (0.0068)	0.0007 (0.0013)	0.0008 (0.0013)	0.0003 (0.0014)
year2012	-0.2120*** (0.0175)	-0.2180*** (0.0174)	-0.2185*** (0.0176)	-0.0222*** (0.0074)	-0.0239*** (0.0073)	-0.0243*** (0.0076)
Constant	0.3488* (0.1808)	0.3028* (0.1771)	0.3706** (0.1774)	-0.0388 (0.0704)	-0.0618 (0.0686)	-0.0419 (0.0709)
Observations	2872	2872	2872	2872	2872	2872
Number of individuals	1436	1436	1436	1436	1436	1436
R-squared	0.22	0.21	0.21	0.08	0.08	0.07

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: authors' estimation based on the 2012 ELMPS.