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Article *in* European Journal of Development Research · April 2018

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Original Article

Effect of Means-Tested Social Transfers on Labor Supply: Heads Versus Spouses—An Empirical Analysis of Work Disincentives in the Kyrgyz Republic

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Abstract Popular perceptions that the provision of income transfers to poor households creates work disincentives prevail. Existing evidence is mixed and depends on the country, the type of transfer, and the population group analyzed. This paper empirically estimates potential work disincentives of a means-tested social transfer for adults with different household positions. Using data from the Kyrgyz Integrated Household Survey 2012, the analysis compares labor market outcomes for household heads and spouses using quasiexperimental methods to assess transfer effects on labor supply. Overall, beneficiaries have on average higher labor market participation rates, but results differ by household position and socioeconomic context. Household heads in beneficiary households are less likely to be economically active than similar nonbeneficiaries. Yet, spouses are more likely to be economically active. Moreover, outcomes depend on whether the household is located in the south or the north of the country.

La perception populaire selon laquelle le transfert monétaire aux foyers pauvres crée une désincitation au travail reste dominante. Les preuves existantes sont mitigées et dépendent à la fois du pays, du type de transfert ainsi que du groupe de population ciblé. Cet article évalue de façon empirique la potentielle désincitation au travail provoquée par un transfert social, en fonction des ressources disponibles pour les adultes, et selon leur position au sein du foyer. En utilisant les données de l'enquête intégrée des foyers kirghizes de 2012, l'analyse compare les résultats du marché du travail pour les chefs de famille et pour leur conjoint avec des méthodes quasi expérimentales pour évaluer les effets de transfert sur l'offre de main-d'œuvre. Globalement, les bénéficiaires ont en moyenne des taux plus élevés de participation au marché du travail, mais les résultats diffèrent selon la position occupée au sein de ménage et selon le contexte socio-économique. Les chefs de famille des foyers bénéficiaires sont moins susceptibles d'avoir une activité économique que leurs homologues non-bénéficiaires. Pourtant, les conjoints sont plus susceptibles d'avoir une activité économique. De plus, les résultats varient selon que le ménage est situé dans le sud ou le nord du pays.

The European Journal of Development Research (2018). https://doi.org/10.1057/s41287-018-0142-7

Keywords: social transfers; work disincentives; intrahousehold allocation; transition economy; Kyrgyz Republic

JEL Codes: I38; J22

Introduction

The objective of social transfers is to help households to cope with shocks and ensure a minimum living standard for those with little or no means. In most countries in Eastern Europe

and Central Asia, which introduced or intensified social assistance programs in the early 1990s, popular perceptions that the provision of income transfers to poor households creates work disincentives prevail. The empirical literature on the relationship between social assistance programs and work disincentives is inconclusive. Evidence from developing countries indicates that social cash transfers hardly have effects on adult labor supply (Banerjee *et al*, 2015; Bosch and Manacorda, 2012). Some studies even find a positive effect due to reallocation of labor within households (ILO, 2010). Evidence from Eastern Europe and Central Asia themselves is still scarce, finding both positive and negative effects depending on the country, the type of social transfer, and the population group analyzed.

According to economic theory, income transfers reduce labor supply at the margin by raising the wage needed to attract workers into the labor market. If leisure is a normal good, the transfer and the related marginal tax rate at the eligibility threshold lead to income and substitution effects, both resulting in lower labor supply (Danziger *et al*, 1981).[1] The strict application of income criteria to poverty-targeted cash transfers is expected to negatively affect the labor market participation of beneficiaries as a result of reduced job search intensity of transfer recipients or the willingness to accept work if the expected wage is only marginally higher than the social transfer (Guzi, 2013). Benefit receipt can also influence the choice between formal and informal sector jobs (Packard *et al*, 2012). If income tests focus on formal income, beneficiaries may be pushed into the informal sector in order to remain eligible (Tesliuc *et al*, 2014; Bosch and Manacorda, 2012). Those with low skills or working in low-paid jobs have fewer incentives to graduate into full-time (formal) work (Gotcheva and Sundaram, 2013). In situations with a high tax wedge on earned (formal) income, beneficiaries may opt for not working or stay in the informal sector to avoid exclusion from social assistance (Koettl, 2013; Koettl and Weber, 2012).

Depending on the household position, adults respond differently to the receipt of benefits. Intrahousehold decisions on labor supply may be reconsidered once a household is eligible for transfers. According to Becker (1965), individual choices within the household and the relationships between these decisions and the production of wealth can be explained by the theoretical assumptions of neoclassical economics, such as maximizing behavior, market equilibrium, and stable preferences.

Changes in the socioeconomic context, such as income, education, and number of children, have different effects on the allocation of time among household members. An increase in the wage rate of spouses may cause an increase in their labor supply and, consequently, a reduction of time devoted to domestic activities and leisure. A change in the income of the spouse does not affect the labor supply of household heads, but a change to the household head's wage rate increases his labor supply and reduces the spouse's labor supply. The presence of children leads the mother to reallocate her time to domestic activities. With respect to fathers, the presence of children increases labor supply and time devoted to household chores, especially for parents with higher education levels and from nonpaternalistic societies (Gronau, 1977).

Given that, in paternalistic societies, labor supply decisions often reflect gendered outcomes, empirical findings from studies on the impact of social transfers on male and female labor supply are relevant for the present analysis. Guzi (2013) finds evidence of a welfare trap created by the tax and social security system in the Czech Republic: individuals, and especially women, who receive relatively higher social benefits, have a higher probability to remain unemployed. The targeted social assistance program in Georgia creates work disincentives around the eligibility threshold and in particular for women. The effects are larger for younger women, married women, and women with children, while no effects were measured for men (Kits *et al*, 2015). In Tajikistan, on the other hand, social assistance transfers had a positive effect on adult

employment rates in female-headed households, indicating the importance of the safety net for the transition from inactivity or informality into employment (Arias and Sanchez-Paramo, 2014). Using data from the Life in Kyrgyzstan survey, Barrientos and Kudebayeva (2015) present ambiguous results of the monthly benefit for poor families (MBPF) on women depending on the data and models used.

The analysis in this paper compares labor market outcomes for household heads and spouses using data from the Kyrgyz Integrated Household Survey 2012. Quasiexperimental methods are applied to assess the effect of the MBPF on active labor market participation and employment. The Kyrgyz Republic was the first Central Asian country to adopt a national poverty benefit, in 1995 (World Bank, 2000). The MBPF is a means-tested transfer targeted at extremely poor households with children whereby eligibility depends on average family income being below the guaranteed minimum income (GMI). Contrary to other studies,[2] the analysis applies matching procedures separately to household heads and spouses in order to estimate average treatment effects on the two groups separately. Our analysis focuses on households with children and further performs the analysis separately for the poorest 40 per cent of the population. In the Kyrgyz Republic, paternalistic traditions are common within families and in wider society (Handrahan, 2001; World Bank, 2011; UNDP, 2012). Current market institutions and prevailing sociocultural attitudes do not support the active involvement of women in economic activity. Although more women than men graduate from higher education institutions, female work is concentrated in lower and poorly paid positions as well as in the informal economy (UNDP, 2012). In addition, women's economic behavior is restrained by limited employment opportunities and the requirement to carry out their traditional family roles (World Bank, 2011). In this context, assuming that intrahousehold allocation decisions might be highly correlated to gender, it is essential to investigate whether means-tested social transfers have distinct effects on labor supply of adults with different household positions. The analysis indicates that, overall, beneficiaries have on average higher labor market participation rates when compared with nonbeneficiaries, but they are more exposed to seasonal effects. Results differ when analyzing different household members separately. Household heads in beneficiary households are less likely to be economically active than similar nonbeneficiaries. Yet, spouses are more likely to be economically active.

The remainder of this paper is structured as follows: the next section describes the MBPF in more detail and critically assesses potential work disincentives arising from the design of the MBPF. Section Data and Methodology describes the data and methodology used for the empirical analysis. Section Results presents and discusses the findings of the empirical analysis, and Section Conclusions concludes.

MBPF and Potential Work Disincentives

The Kyrgyz labor market is characterized by insufficient labor demand, high informality, and a sizable gender gap. Over the last decade, the labor force frequently grew more rapidly than the annual growth of employment. Approximately 70 per cent of employment is informal, and almost two-thirds of those working in the informal sector are self-employed. Underemployment is particularly an issue in rural areas. Although unemployment rates are lower in rural areas, the work intensity is lower and seasonal employment is more frequent. The employment-to-population rate is considerably lower for women than for men. Women are furthermore more likely to work in activities and occupations involving lower wages (Schwegler-Rohmeis, 2013).

The social protection system of the Kyrgyz Republic comprises both contributory and noncontributory transfers and services, which play an important role in helping individuals and families cope with income shocks. The MBPF is a means-tested, noncontributory social assistance benefit targeted to poor households with children. It is a variable benefit and covers the gap between the guaranteed minimum income (GMI) and the average per capita family income for each child up to the age of 18 in eligible households. The income assessment includes both formal and informal income. In addition to monetary income, in-kind incomes (e.g., from agriculture) and the possession of family assets (e.g., durable goods, draft animals) are taken into account to determine benefit eligibility (Hasanov and Izmailov, 2011). In 2012, the GMI was equal to KGS 370 per month,[3] which reflected less than 30 per cent of the extreme poverty line.[4]

Despite its potential to alleviate extreme poverty, which accounted for 4 per cent of the population in 2012 (Mamadaliev, 2014), and contribute to equalizing opportunities in the years of childhood, the impact on poverty reduction is limited due to low coverage and benefit levels. The number of MBPF beneficiaries has been declining, from 480,000 beneficiaries in 2005 to 377,000 beneficiaries in 2011 (Mamadaliev, 2014). Based on estimates derived from the Kyrgyz Integrated Household Survey (KIHS),[5] 7.4 per cent of the population lived in a beneficiary household in 2012. Coverage is highest among the poorest households, with 13.3 per cent of the population of the first and 19.4 per cent of the population of the second decile covered. Although the allocation of the MBPF is progressive with over 50 per cent of total transfers reaching the poorest 20 per cent, more than 80 per cent of extremely poor children below the age of 18 are not covered. In 2012, MBPF transfers accounted for 12.2 per cent of total household consumption among the poorest recipient households.

Income from wage remains the most important income source for Kyrgyz households and accounts for 66.2 per cent of total household income in MBPF households. On average, the share of wages is slightly higher for the poor and extremely poor, compared with the MBPF recipients (Table 1), suggesting that MBPF beneficiaries might behave differently in the labor market compared with other equally poor households. Table 1 also hints at the importance of informal transfers. In MBPF households, money from relatives and work abroad accounts for 20 per cent of total household income, which is considerably more compared with the average for all households (11.8 per cent).

To understand the potential for work disincentives, the GMI and average MBPF transfer have to be compared with local salaries and minimum wage regulations. The average monthly wage in the formal economy was KGS 10,884 in 2012, and the lowest average wage was

Table 1: Household income composition, by poverty status and MBPF receipt, 2012

Components of total income	*Total population (%)*	*Poor (%)*	*Extremely poor (%)*	*MBPF beneficiaries (%)*
Wage	66.2	64.5	64.7	54.4
Agricultural activities	11.5	11.9	9.5	18.6
Pension	16.7	17.7	19.9	11.9
Money from relatives and work abroad	11.8	11.9	18.0	20.0
MBPF	0.7	1.4	1.2	9.2
Other benefits and income sources	1.3	1.4	1.8	1.6
No. of observations	4999	1246	115	214

Source: Authors' calculations based on KIHS 2012.
Notes: Average shares across households.

reported for agriculture, hunting, and forestry (KGS 5454) (National Statistics Committee, www.stat.kg). Informal agricultural labor pays considerably less. The average monthly wage for persons involved in planting or animal production is less than KGS 500, which is below the official minimum wage (KGS 760 per month in 2012) (National Statistics Committee, www.stat.kg). Given the low level of the GMI, the amount of MBPF benefits a household is maximally entitled to is less than the wage this household could earn in the formal and most of the informal labor market. It is therefore unlikely that the MBPF a priori creates work disincentives, a conclusion which is also supported by Gotcheva and Sundaram (2013) for the Western Balkans.

The design of the MBPF, whereby the transfer amount is equal to the gap between total family income per capita and the GMI, theoretically imposes a 100 per cent marginal tax rate on income exceeding the GMI. It assumes that the means test is strictly applied with recertification in the event that the family income has changed. While this might be feasible for income from formal employment or other social transfers, it is administratively more challenging to assess changes in informal income. The prospect that each additional Kyrgyz Som earned reduces the MBPF by one Kyrgyz Som may prevent beneficiaries from reporting additional income and deter them from accepting work if the expected wage only marginally exceeds the GMI. This potential poverty trap is further enhanced by several in-kind benefits MBPF and other poor households are entitled to (Gassmann and Trindade, 2015).

Data and Methodology

The empirical analysis uses data from the 2012 Kyrgyz Integrated Household Survey (KIHS). The KIHS is an annual household survey implemented by the National Statistics Committee (NSC) of the Kyrgyz Republic. Households participating in the KIHS are visited four times per year. The 2012 KIHS contains information on 5000 households and is representative at national and regional level. The survey provides information on the demographic composition of the household, incomes, expenditures, housing, assets, and labor. The labor module of the KIHS collects quarterly data for present and migrant individuals 15 years and older. The subsequent analysis uses quarterly data in order to capture seasonal effects, as it is likely that an individual's participation in the labor market varies throughout the year, but only considers individuals present in the household.

The KIHS is designed as a stratified two-stage random sampling survey. The 15 strata represent the urban and rural dimensions of the seven oblasts and the capital city of Bishkek. Given the rather complex sample design (Esenaliev *et al*, 2011), standard errors calculated under the assumption of simple random sampling are likely to be downwardly biased. For this reason, all estimations consider the sample design variables and sampling weights available in the data.

In assessing the impact of cash transfers on work disincentives, the analysis considers different labor market outcomes. Active labor market participation includes both employed and unemployed individuals. Although the definition for employed individuals follows the International Labour Organization (ILO) convention, it does not consider individuals engaged in unpaid informal activities. We therefore use a second labor market outcome, referred to as extended employment, which includes individuals engaged in informal unpaid activities, such as working on the plot, in the forest, or the own production of goods. The third labor market outcome considers formal and informal work,[6] while the fourth outcome focuses only on informal work. The analysis of labor market outcomes of beneficiaries and nonbeneficiaries

focuses on the able-bodied working-age population (aged 18–62 years old for men, and 18–57 for women), excluding full-time students,[7] living in households with children under 18 years old, unless indicated otherwise. This group (reference population) represents 38.5 per cent of the total population in the Kyrgyz Republic. The position of household head is more common among men (74.4 per cent), while spouses are generally women (96.5 per cent).

The treatment group in the subsequent analysis are able-bodied working-age individuals, not studying, living in a household with children under 18 years old, and receiving the MBPF. Note that the term "MBPF beneficiary or recipient" used throughout the text refers to all individuals living in a MBPF recipient household, unless indicated otherwise.

The analysis in this study empirically assesses the potential existence of adverse incentives for labor force participation for adult MBPF beneficiaries with different household positions. As a first step, we use binary response models and a Heckman selection model to test whether individuals living in MBPF beneficiary households are more or less likely to participate in the labor market. The analysis focuses on four different outcomes: (i) active labor market participation, (ii) extended employment (including unpaid work),(iii) participation in informal work (including unpaid work), and (iv) work intensity. The models are estimated separately for quarter 1 (winter) and quarter 3 (summer) to capture seasonal variations. The probability of an individual to be active or to be employed is assumed to be a function of: MBPF beneficiary status, individual characteristics (gender, age, level of educational attainment), household characteristics (household size, the number of children under 6 years old, and the number of children between 6 and 18 years old), and geographical location (residing in the southern part of the country, rural area, and mountainous areas). The models further include a variable indicating whether a household receives remittances from relatives or work abroad to capture informal transfers. Remittances are likely to be endogenous in the labor supply equation, as the labor supply status of individuals from households receiving informal transfers may affect the decision of the remittance sender. Given that the focus of our analysis is on benefit receipt, we use remittances only as a control variable to increase the precision of the coefficient estimate of the variable of interest. Hence, no causal interpretation should be given to its coefficient. Given the pronounced differences in labor force participation by household position, the models are estimated separately for household heads and spouses. The model for informal work is estimated only for employed household heads and spouses in the sample, including those engaged in unpaid work (extended definition of employment). Work intensity is measured by total hours worked per week at the principal and additional places of employment (including unpaid work). A Heckman selection model is used, as the sample of workers (or of nonworkers) is not a random sample of the population (Heckman, 1979). This model framework treats unobserved selection factors as a problem of specification error or omitted variables, correcting for bias in the estimation of the outcome equation by explicitly using information from the determinants of the probability of being employed (including unpaid work), the sample selection equation. Finally, the four models are estimated again, but this time only including the bottom 40 per cent of the welfare distribution, assuming that the determinants of labor market participation differ for low-income households.

Given the limitations of binary response models, a quasiexperimental design is used to establish an adequate counterfactual to isolate effects from program participation. Given the cross-sectional nature of the data, this study applies propensity score matching (PSM), whereby individuals from the treatment group (MBPF beneficiaries) are matched with similar individuals from the control group. By comparing the labor market outcomes of these two groups, we will be able to analyze whether or not the MBPF creates work disincentives. The

PSM model estimates the average treatment effect (ATT) of the treated (i.e., MBPF receipt) on labor market outcomes[10] according to the following model specification:

$$\mathrm{LM}_i = \beta_0 + \beta_1 T_i + \beta_2 \boldsymbol{X} + u_i,$$

where LM_i refers to the labor market outcome for able-bodied working-age adults, T_i is the identifier for MBPF beneficiary (treatment group), $\boldsymbol{X}$ is the vector of variables used for matching, and u_i is the error term. The coefficient β_1, estimated for the benefit variable, measures the average treatment effect on the treated (ATT), and reflects the heterogeneity of the impact via interaction with other variables. The quasiexperimental analysis is applied to each quarter of 2012, as seasonal effects are likely to have an effect on labor market outcomes. The model further considers the hypothesis that labor market outcomes of MBPF beneficiaries differ for heads and spouses, given their position in the household. To test the hypothesis that the MBPF program has different impacts according to the location of a household, the sample is then divided into households living in the north and south of the country. The PSM model considers individual and household characteristics to estimate the impact of receiving the MBPF on labor market outcomes. As matching variables for heads and spouses, the model considers individual characteristics (age and gender), household characteristics (household size, presence of children under 6 years old, and presence of children between 6 and 18 years old), housing conditions (walls, water), and household location (rural area, mountainous area, and south region). Table 4 (see Annex) provides summary statistics for the variables included in the analysis.

To verify whether the matching estimators identify and consistently estimate the treatment effect of the treated, two assumptions must be satisfied by the model: (i) the conditional independence assumption, and (ii) the common support condition. The first verifies that the treatment group is independent of unit characteristics after controlling for a set of observed covariates; if outcomes are independent of participation, then participation is exclusively based on observable characteristics and all variables that influence participation and potential outcomes simultaneously are observed. Therefore, the independence condition implies conditional exogeneity of program selection, so that the unobserved characteristics can be replaced by the observed ones (Rosembaum and Rubin, 1983). Thus, according to Ravallion (2008), impact estimates obtained using PSM are always dependent on the variables used for matching and the quantity and quality of available data. Although PSM is not necessarily the most efficient impact estimator, exact matching eliminates selection bias under the independence assumption. It "assumes away" the problem of endogeneity of the social transfer variables, only requiring to balance the conditional probability, i.e., the propensity score.

When testing whether the matching characteristics used to estimate the propensity score balance between treatment and comparison group units,[11] we verify that most of the standardized differences and variance ratios for the covariates are closer to the expected values of zero and one (Table 5 in the Annex). Diagnostic kernel density plots using the matched propensity score distributions appear to be balanced (Figure 3 in the Annex) and satisfy the common support or overlap. This assumption is automatically tested when estimating the ATT using *teffects psmatch*, and the estimator is not identified when the overlap assumption is violated. The unmatched and matched distributions of the propensity score for employed adults are omitted since they are similar to the one presented.

Results

About 80 per cent of the reference population are active labor market participants.[8] Participation rates for MBPF beneficiaries are between 1.5 and 5 percentage points lower compared with the average. Total labor force participation rates in the north are higher than in the south (Figure 1).[9] Although MBPF beneficiaries living in the north appear to have lower labor force participation rates, the difference is not statistically significant. Seasonal employment has a stronger and significant influence on the participation rate of beneficiaries living in the south: in the southern oblasts, the share of employed beneficiaries varies between 58.5 per cent in the first quarter and 78.6 per cent in the third quarter, while in the north the seasonal changes are not significant. MBPF beneficiaries living in the north are less likely to be employed at firms, institutions or collective farms compared with the south, but more likely to be self-employed and wage workers. They are also more likely to be engaged in informal economic activities compared with those living in the south (Gassmann and Trindade, 2015).

Unemployment rates in 2012 started at a relatively high 9.7 per cent in the first quarter and declined to 5.5 per cent at the end of the year. This reflects the overall economic situation in the Kyrgyz Republic and the seasonality of employment in agriculture (Esenaliev *et al*, 2011). As the Kyrgyz economy only regained speed in the second half of 2012 and 2013, MBPF beneficiaries were particularly hard hit with unemployment in the first quarter of 2012 compared with the rest of the population (16.6 per cent). However, in the second half of 2012, unemployment rates for beneficiaries were slightly below average. As Figure 2 shows, labor force participation rates differ substantially by household position. Household heads are more active in the labor market than spouses, and they are less affected by seasonal variations. While household heads' rates remain above 80 per cent throughout the year, the rate for spouses varies from 64.6 per cent in the first quarter to 76.5 per cent in the third quarter. This also reflects the gender distribution of heads and spouses. Heads are predominantly male (76 per

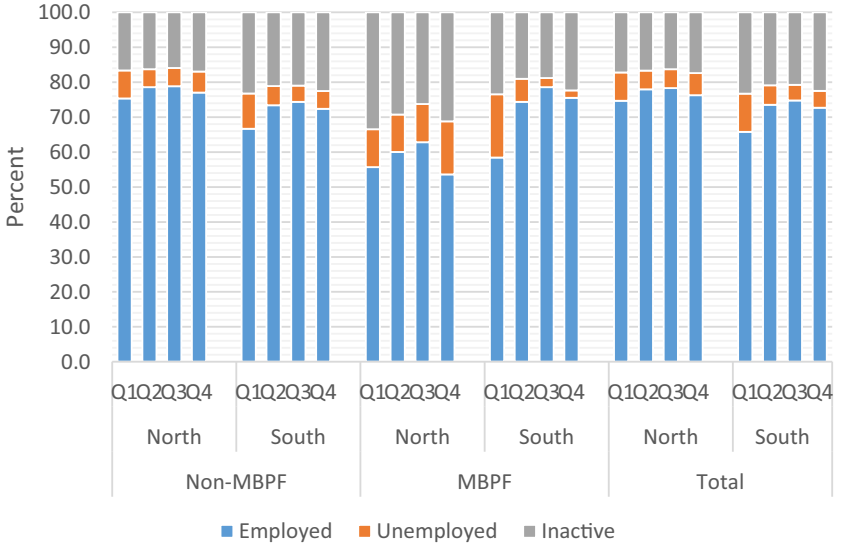

Figure 1: Labor force participation rates by quarter, 2012. *Source*: Authors' calculations based on KIHS 2012.

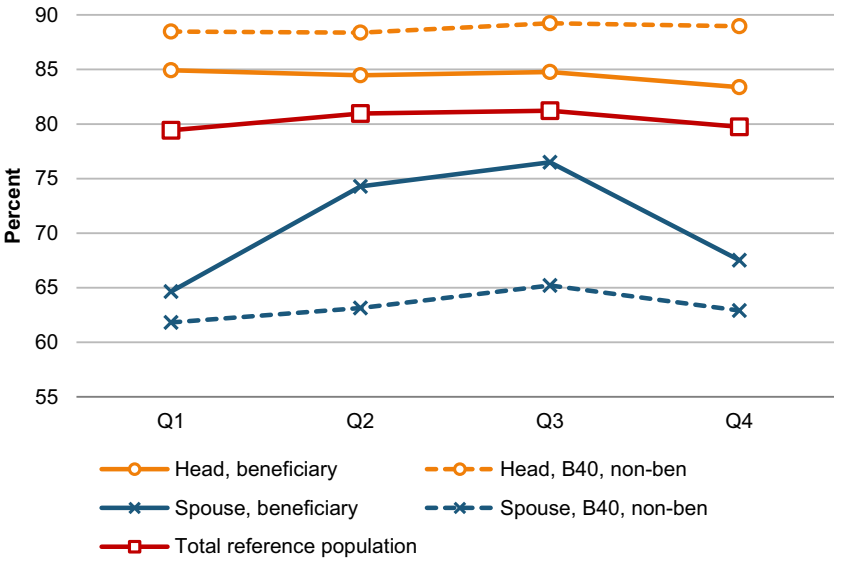

Figure 2: Active labor force participation of heads and spouses, Q1–Q4, 2012. *Source*: Authors' calculations based on KIHS 2012.

cent), while spouses are in most cases female (97 per cent) (Table 4 in the Annex). While the difference in participation between heads in MBPF recipient households and other poor households is small, their spouses have significantly higher activity rates than spouses in poor nonbeneficiary households.

Determinants of Labor Market Outcomes

Based on the results from the binary models, receiving an MBPF transfer is neither negatively nor positively correlated with active labor market participation irrespective of the individual's household position (Table 2). The only exception are household heads in MBPF recipient households, who are less likely to be active in the first and third quarters compared with other poor heads. The strongest determinant which is positively correlated with active labor force participation across all models is gender. Male household heads are between 27 and 29 percentage points more likely to be active (Table 6 in the Annex). This is hardly a surprising result given that, in most countries, men have higher labor market participation rates than women (see, e.g., Verick, 2014). Lower educational attainment of women, social norms regarding women's position in society, and, maybe most importantly, care duties of women are among the most frequently cited reasons explaining the gender gap in labor market participation (Verick, 2014; Thévenon, 2013). Female participation rates may however be underestimated if unpaid work and domestic activities are not included in labor market statistics (Verick, 2014). Given that the size of the MBPF depends on the number of children, the presence of more children may lead to negative work incentives. The analysis indicates that the number of children indeed matters, but that the age of the children plays a role as well. The number of children below the age of six reduces the likelihood of spouses to be active in the labor market, irrespective of the specific outcome analyzed. On the other hand, an increasing number of children aged 6–18 has a weak but positive effect on the labor market participation

Table 2: Determinants of labor market outcomes using linear probability and Heckman selection models with exogenous MBPF, 2012

Labor outcome	*Quarter 1*				*Quarter 3*			
	All		*Poorest 40 %*		*All*		*Poorest 40 %*	
	Household head	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*
Marginal effects for MBPF participation								
Active	−0.058	−0.006	−0.142*	−0.019	−0.092	0.022	−0.160***	0.022
	(0.063)	(0.036)	(0.077)	(0.047)	(0.061)	(0.035)	(0.057)	(0.082)
Extended employment (including unpaid work)	−0.145**	−0.061	−0.222***	−0.076	−0.087	0.052	−0.125*	0.082
	(0.062)	(0.043)	(0.075)	(0.058)	(0.067)	(0.041)	(0.068)	(0.060)
Informal work (extended employed)	0.138*	0.336***	0.016	0.534***	0.139**	0.311***	0.016	0.519***
	(0.071)	(0.104)	(0.078)	(0.130)	(0.067)	(0.097)	(0.082)	(0.099)
Coefficient for MBPF participation								
Hours worked (ln) in formal and informal work	−0.035	−0.558**	−0.034	−0.189	−0.041	0.035	0.100	−0.073
	(0.124)	(0.269)	(0.139)	(0.216)	(0.066)	(0.099)	(0.068)	(0.158)

Source: Authors' calculations based on KIHS 2012.
Notes: Standard errors in parentheses; *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

of household heads. Given that spouses are mainly female, inactivity may be a deliberate choice in order to care for small children. Assuming that the costs of having school-aged children are higher, household heads may need to work in order to cover the extra costs. These findings are in line with Gronau's (1977) observation that the presence of children induces fathers to increase their labor supply. The relation between active labor market participation and place of residence varies across the models. Living in rural areas increases the likelihood of spouses to be active, but it loses its significance when only considering spouses in poor households. Living in the south of the country reduces the likelihood of active labor force participation for household heads in the first quarter, but it does not matter if only heads in poor households are included in the model.

In Table 2, the analysis also uses extended employment (including unpaid work) as labor market outcome variable. While the signs of the explanatory variables remain the same, the magnitude and significance of some determinants change. Household heads in MBPF recipient households are less likely to be employed in the first quarter of the year. This result is most probably driven by the significantly higher unemployment rate for MBPF beneficiaries in the first quarter of 2012. For spouses, MBPF receipt has no effect on their likelihood to be employed or engaged in unpaid work. Although the gender variable is still highly significant in all models, the marginal effects are smaller for extended employment. This supports the argument made above, that standard labor market definitions may underestimate female labor market participation given that women are often engaged in unpaid work. The presence of young children decreases the likelihood of employment of spouses, except for poor spouses in the first quarter (Table 7 in the Annex).

The last set of binary response models considers determinants of informal work, including unpaid activities (Table 2). Spouses in MBPF households are between 31 and 53 percentage points more likely to be active in the informal sector. The effects for household heads are also positive at around 14 percentage points, but only if all heads are considered. Given that the effects are much larger for spouses and with 96 per cent of spouses being female, these results may reflect gender-based preferences. One of the concerns about means-tested social assistance programs relates to the potential risk that such transfers will push recipients into the informal sector (Tesliuc *et al*, 2014). While such effects have been found, for example in countries of the Western Balkans (Gotcheva and Sundaram, 2013; Koettl and Weber, 2012), it is not clear whether similar mechanisms explain the high likelihood of female MBPF beneficiaries to work informally in the Kyrgyz Republic. Informal employment accounts for 70 per cent, which is significantly higher than in most countries in the Western Balkans. The argument that particularly individuals with low levels of education and low skills are pushed into informality (Koettl, 2013) does not hold either. Compared with individuals with only completed primary education, incomplete general secondary or less, adults who completed general secondary education or higher are neither less nor more likely to work in the informal sector (Table 8 in the Annex). Furthermore, the means test in the Kyrgyz Republic includes income from all sources, whether formal or informal, and also accounts for potential income from land ownership.

Work intensity differs among employed adults. Using Heckman selection models, we estimate the determinants of hours worked per week for household heads and spouses (Table 2). MBPF receipt has no impact on the number of hours worked for household heads. But spouses in MBPF households tend to work less during the winter season, suggesting that the MBPF might have the potential to replace income during periods in which agricultural activities are harder to be executed. The hourly wage is strongly positively associated with a higher workload. The number of hours worked by spouses is often more sensitive to increases

in wage per hour than those by household heads. Finally, the presence of children is negatively correlated with work intensity of spouses and household heads if the children are below the age of six and not attending a nursery or kindergarten. However, when children are above the age of 6 and below 18, household heads are more likely to work less (Table 9 in the Annex).

Given that the binary analysis above does not allow assessment of the impact of MBPF receipt on labor market outcomes, PSM is used to establish the counterfactual for MBPF beneficiaries. Control groups are created for each subgroup of the population (by household position and location).[12] This approach allows disentangling the impact of the MBPF on labor market outcomes for different groups. Table 3 presents the estimated average treatment effects for each subgroup.

Determinants of MBPF Participation

The first step of PSM estimates a binary response model of MBPF receipt. This provides insights into the determinants of programme participation. The covariates are individual

Table 3: Average treatment effect (ATT) of MBPF participation on labor market outcomes, 2012

Sample	*Outcome variable for the ATT*					
	Active		*Employed (extended definition)*		*Informal (extended definition)*	
	Household head	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*
All						
Q1	−0.076***	−0.075***	−0.193***	−0.237***	0.049***	−0.007**
	(0.004)	(0.006)	(0.005)	(0.005)	(0.003)	(0.003)
Q2	−0.046***	0.054***	−0.046***	0.073***	0.026***	0.241***
	(0.005)	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)
Q3	−0.057***	0.024***	−0.097***	0.091***	0.105***	0.319***
	(0.004)	(0.005)	(0.004)	(0.005)	(0.003)	(0.003)
Q4	−0.013***	−0.085***	−0.059***	−0.031***	0.083***	0.204***
	(0.003)	(0.005)	(0.004)	(0.006)	(0.003)	(0.004)
North						
Q1	−0.004*	−0.435***	−0.145***	−0.316***	−0.058***	0.028***
	(0.002)	(0.009)	(0.007)	(0.008)	(0.004)	(0.007)
Q2	0.102***	−0.281***	0.049***	−0.302***	0.151***	−0.031***
	(0.006)	(0.011)	(0.008)	(0.010)	(0.006)	(0.007)
Q3	−0.005	−0.221***	0.054***	−0.205***	0.238***	−0.050***
	(0.003)	(0.011)	(0.005)	(0.011)	(0.006)	(0.006)
Q4	−0.017***	−0.200***	−0.181***	−0.090***	−0.041***	−0.043***
	(0.002)	(0.007)	(0.006)	(0.011)	(0.005)	(0.007)
South						
Q1	−0.103***	0.102***	−0.245***	0.004	−0.065***	0.134***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.003)	(0.005)
Q2	−0.027***	0.258***	−0.077***	0.223***	−0.105***	0.207***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.003)	(0.003)
Q3	−0.021***	0.125***	−0.062***	0.367***	0.155***	0.409***
	(0.006)	(0.005)	(0.006)	(0.005)	(0.003)	(0.004)
Q4	0.006	0.003	−0.102***	0.127***	0.104***	0.294***
	(0.005)	(0.005)	(0.004)	(0.005)	(0.003)	(0.003)

Source: Authors' calculations based on KIHS 2012.
Notes: Standard errors in parentheses. *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

characteristics (age and gender), household characteristics (household size, presence of children under 6 years old, and presence of children between 6 and 18 years old), housing conditions (walls, water), and household location (rural area, mountainous area, and south region) (Table 10 in the Annex). The results indicate that household heads and spouses are more likely to receive the MBPF when they are older, live in larger households, and with children under six. Moreover, housing quality as an indirect indicator of living standards matters as well, as MBPF receipt is more likely if the walls are not made of brick or concrete. Finally, both heads and spouses have a higher probability of receiving the MBPF if they live in the south. On the other hand, living in a rural area increases the likelihood of benefit receipt only for spouses.

Effect of MBPF Receipt on Labor Market Outcomes

The analysis shows that the position in the household and the location of the household matter for the effect of MBPF receipt on labor market participation. Moreover, effects vary across seasons for certain groups. Household heads who are MBPF beneficiaries are less likely to be economically active than similar nonbeneficiaries throughout the year; on the other hand, spouses are more likely to be economically active during the warmer months (quarters 2 and 3). The negative effect of the MBPF on household head participation varies between −7.6 percentage points in the first quarter to −1.3 percentage points in the fourth quarter. Spouses in MBPF households are around 8 percentage points less likely to be active in quarters 1 and 4, and between 2 and 5 percentage points more likely to be active in quarters 2 and 3. The country-level analysis masks stark differences between regions in the north and south of the country. The MBPF negatively affects labor market participation in the north, particularly for spouses and throughout the year. On the other hand, the MBPF results in significantly higher labor market participation among spouses in the south, except for the last quarter. Use of extended employment as outcome variable, which includes unpaid work, increases in most cases the effects for both household heads and spouses, though the increase is often more pronounced for spouses.

Based on economic theory, we expected the MBPF to negatively affect labor market participation given that eligibility depends on formal and informal income. However, the analysis produced mixed results depending on the household position, household location, and time of year considered. Although the eligibility criteria are strictly applied, the analysis of the targeting performance indicated that also nonpoor households benefit from the MBPF. It remains challenging to assess family income given that the Kyrgyz economy is predominantly rural and largely informal. Income from land is, for example, imputed and depends on the size of land and the respective land coefficients, which are established administratively (Hasanov and Izmailov, 2011). Remittances from migrants in Russia and Kazakhstan are widespread and are also difficult to trace. Most MBPF beneficiaries live in rural areas and are engaged in agricultural activities. As the demand for labor varies at different points in the season, labor scarcity and seasonal or temporary unemployment are expected during the winter season. This may explain why we see changes across quarters in the relation between benefits and labor outcomes and why the effects are often stronger in case of the extended definition of employment and informal work, assuming that spouses, who are mainly women, engage in unpaid activities related to subsistence agriculture. For adult women, seasonal underemployed might be less evident since they undertake the largest share of domestic work, including child care.

The opposite findings for heads and spouses provide support to the theory that additional income leads to intrahousehold reallocation of labor supply. In response to MBPF eligibility,

households may indeed have changed their preferences. One of the most striking findings of the analysis is the pronounced difference in outcomes between the north and south of the country. It is indeed as if the Kyrgyz Republic is not one, but two countries (Pannier, 2010). Compared with the empirical findings from other countries in the region that analyzed the differential impacts of social transfers on men and women, the negative effects found for spouses in the north seem to confirm the findings for Georgia (Kits *et al*, 2015), while our findings for the south seem to align more with findings from Tajikistan, where social assistance transfers led to an increase of employment in female-headed households (Arias and Sanchez-Paramo, 2014). The south is economically, socially, and ethnically rather different from the north. The population in the southern provinces (Osh, Jalalabad, and Batken) mainly live from agriculture and livestock. They are farmers and herders. The Ferghana Valley is highly fertile and shared by Kyrgyzstan, Tajikistan, and Uzbekistan. Uzbeks and Tajiks are the predominant ethnic groups in the south of the country. Osh City hosts one of the largest markets in Central Asia, and the trade relationships with the neighboring countries, including China, are strong. On the other hand, the northern provinces, including the capital Bishkek, host most of the industrial zones and are more "russified" (Pannier, 2010). Average wages in the southern provinces are below the national average, and poverty is more widespread. This may explain the greater urgency of being economically active, especially for the spouses. It may also indicate that it is easier to engage in informal and seasonal work in the south given its economic structure.

Conclusions

In this paper, we empirically estimated the potential work disincentives of a means-tested income transfer with a particular focus on the household position of adult individuals and the socioeconomic context of the location. The paper contributes to the hitherto mixed evidence on labor market effects of income transfers. The analysis first considered the determinants of active labor market participation, extended employment, and the likelihood of doing informal work using binary response models estimated with maximum-likelihood probit models. To capture possible variations in the relevance of different determinants for household heads and spouses, the models were estimated separately for each group. Moreover, separate models were estimated for the poorest 40 per cent of the population, and, using the availability of quarterly labor force data, estimates were provided for the first and third quarter separately in order to capture seasonal variation.

The MBPF is the only income transfer in the Kyrgyz Republic specifically targeted at extremely poor households with children. It is a means-tested transfer whereby eligibility depends on average formal and informal family income. Although the design of the MBPF implies a 100 per cent marginal tax rate for income above the eligibility threshold, the likelihood of potential work disincentives is limited. Even though income transfers can create labor market disincentives, similar to other countries in Eastern Europe and Central Asia, such concerns are not warranted given the low generosity (and generally also low coverage) of social assistance benefits (Arias and Sanchez-Paramo, 2014).

The analysis in this paper indicates that individuals living in MBPF households have on average higher labor market participation rates when compared with nonbeneficiaries, but this aggregate conclusion masks heterogeneous effects across different groups. Household heads in MBPF households are less likely to work throughout most of the year. Location, with reflects the socioeconomic environment of the household, matters only to some extent. However, for spouses, location matters. Spouses in MBPF households in the south have better labor outcomes

compared with nonrecipients, while the effect is opposite in northern provinces. Given that MBPF beneficiaries predominantly live in rural areas and are engaged in farming activities, the effects are sensitive to the season considered. Despite high levels of labor market participation among both MBPF beneficiaries and nonbeneficiaries, making ends meet remains difficult for many households given the low wages in the agricultural sector, in which most of the poor in rural areas are engaged.

Acknowledgments

We thank the National Statistical Committee of the Kyrgyz Republic for the provision of the data.

Notes

1. This assumes elastic labor supply, an assumption which is rather unlikely in most lower- and middle-income countries (Barrientos and Villa, 2015).
2. Barrientos and Kudebayeva (2015) apply binary models to the cross-section and panel component of the Life in Kyrgyzstan data.
3. Equivalent to 19.36 USD PPP in 2012 (USD PPP from IMF, 2015).
4. The extreme poverty line was KGS 1286 per capita per month in 2012. The absolute poverty line was KGS 2182 (NSC). The GMI is set by government decree depending on the available financial resources and expected number of beneficiaries.
5. Authors' calculations. See next section for a description of the data.
6. Informal work includes informal employment, informal self-employment, and own production activities in case of unemployment or inactivity.
7. Adults indicating to be *day students* when reporting their social status were excluded from the analysis given the importance of education for human capital development.
8. Differences across quarters are not statistically significant.
9. South: Osh, Jalalabad, Batken. Differences are statistically significant at 99 per cent confidence level.
10. The average treatment effect (ATT) of the treated was estimated using the Stata program *teffects psmatch*.
11. Stata14 provides the command *tebalance summary*, used after *teffects psmatch*, which calculates for each covariate the standardized difference, that is, the size of the difference in means of a conditioning variable (between the treatment and comparison units), scaled by (or as a percentage of) the square root of the average of their sample variances, and the variance ratio. In this paper, after estimating the ATT using *teffects psmatch*, *tebalance summary* was used.
12. Across quarters, treatment and control groups remain the same, as individual and household characteristics are based on the situation in the first quarter.

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Annex

See Figure 3 and Tables 4, 5, 6, 7, 8, 9, and 10.

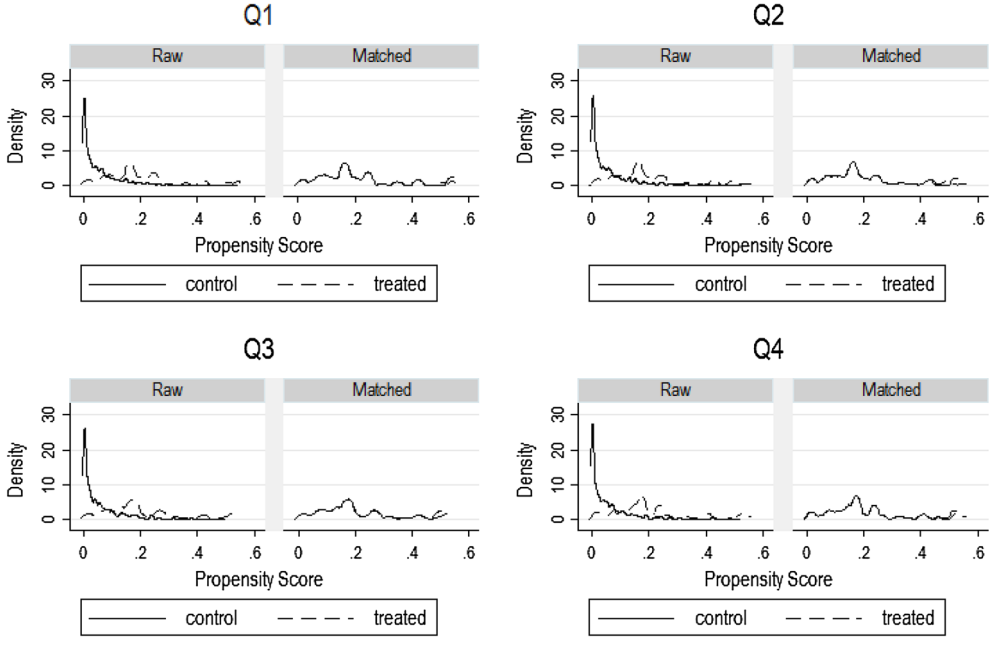

Figure 3: Diagnostic kernel density distribution of the propensity score for active labor market participation. *Source*: Authors' calculations based on KIHS 2012.

Table 4: Summary statistics for variables used in the analysis

*Variable**	*Household head*					*Spouse*				
	Obs.	*Mean*	*Std. dev.*	*Min.*	*Max.*	*Obs.*	*Mean*	*Std. dev.*	*Min.*	*Max.*
MBPF beneficiary household	2594	0.07	0.25	0	1	1962	0.07	0.26	0	1
Male	2594	0.76	0.43	0	1	1962	0.03	0.17	0	1
Age (years)	2594	45.03	8.19	18	62	1962	41.33	8.24	19	61
Education – higher or general secondary degree	2594	0.97	0.18	0	1	1962	0.97	0.16	0	1
Household size (ln)	2594	1.45	0.34	1	2	1962	1.53	0.27	1	2
Number of children under 6	2594	0.60	0.77	0	4	1962	0.63	0.77	0	4
HH has at least one child under 6	2594	0.44	0.50	0	1	1962	0.47	0.50	0	1
Number of children above 6 and below 18	2594	1.58	1.04	0	6	1962	1.66	1.06	0	5
HH has at least one child above 6 and below 18	2594	0.87	0.34	0	1	1962	0.88	0.33	0	1
Rural area	2594	0.43	0.50	0	1	1962	0.45	0.50	0	1
Southern oblasts	2594	0.40	0.49	0	1	1962	0.38	0.49	0	1
Mountainous area	2594	0.35	0.48	0	1	1962	0.36	0.48	0	1
HH receives money from relatives or work abroad	2594	0.23	0.42	0	1	1962	0.20	0.40	0	1
House: walls not made from brick or concrete	2567	0.62	0.48	0	1	1945	0.65	0.48	0	1
House with no running water	2594	0.50	0.50	0	1	1962	0.48	0.50	0	1
Active labor market participation										
Q1	2594	0.90	0.30	0	1	1962	0.67	0.47	0	1
Q2	2564	0.90	0.29	0	1	1951	0.69	0.46	0	1
Q3	2530	0.90	0.30	0	1	1926	0.70	0.46	0	1
Q4	2493	0.89	0.31	0	1	1903	0.68	0.47	0	1
Employed (extended definition)										
Q1	2594	0.85	0.35	0	1	1962	0.69	0.46	0	1
Q2	2564	0.88	0.32	0	1	1951	0.72	0.45	0	1
Q3	2530	0.89	0.31	0	1	1926	0.72	0.45	0	1
Q4	2493	0.88	0.33	0	1	1903	0.70	0.46	0	1
Informal work (extended definition)										
Q1	2214	0.30	0.46	0	1	1352	0.42	0.49	0	1
Q2	2257	0.31	0.46	0	1	1407	0.43	0.50	0	1
Q3	2248	0.31	0.46	0	1	1395	0.43	0.50	0	1
Q4	2190	0.29	0.46	0	1	1324	0.40	0.49	0	1
Engaged in own production activities										
Q1	2594	0.19	0.39	0	1	1962	0.23	0.42	0	1
Q2	2564	0.18	0.38	0	1	1951	0.25	0.44	0	1
Q3	2530	0.17	0.37	0	1	1926	0.24	0.43	0	1
Q4	2493	0.16	0.37	0	1	1903	0.21	0.41	0	1

Source: Authors' calculations based on KIHS 2012.
*Variables refer to quarter 1 unless indicated otherwise.

Table 5: Covariate balance summary of the propensity score for active labor market participation

Variable used for matching	*Quarter 1*				*Quarter 3*			
	Standardized differences		*Variance ratio*		*Standardized differences*		*Variance ratio*	
	Raw	*Matched*	*Raw*	*Matched*	*Raw*	*Matched*	*Raw*	*Matched*
Household head								
Male	0.000	−0.059	1.000	1.074	0.008	−0.002	0.991	1.002
Age	−0.331	−0.134	0.777	1.096	−0.328	−0.146	0.794	1.599
Age sq	−0.348	−0.119	0.795	1.097	−0.360	−0.114	0.795	1.580
Household size	0.605	−0.519	0.558	0.653	0.594	−0.519	0.565	0.832
Number of children under 6	0.559	−0.220	0.865	1.282	0.537	0.088	0.880	0.940
Number of children above 6 and below 18	0.148	−0.204	0.705	2.052	0.167	−0.287	0.666	3.485
House walls not made from brick or concrete	0.837	−0.047	0.207	1.231	0.839	−0.207	0.207	3.444
House with no running water	−0.381	0.361	0.887	1.524	−0.357	−0.081	0.901	0.954
South oblasts	0.660	0.343	0.645	0.706	0.706	0.084	0.605	0.883
Rural	0.493	0.001	0.614	0.999	0.476	0.445	0.630	0.639
Mountainous area	0.323	0.169	1.352	1.136	0.288	0.410	1.334	1.610
Spouse								
Male	−0.273	−0.128	0.019	0.070	−0.278	−0.237	0.018	0.024
Age	−0.552	−0.010	0.633	1.139	−0.546	−0.041	0.624	1.280
Age sq	−0.575	0.009	0.606	1.202	−0.565	0.010	0.616	1.411
Household size	0.559	−0.135	0.885	1.009	0.554	−0.187	0.890	1.073
Number of children under 6	0.435	−0.053	0.895	1.041	0.441	−0.117	0.896	1.104
Number of children above 6 and below 18	0.123	−0.370	0.744	6.427	0.107	−0.120	0.769	1.451
House walls not made from brick or concrete	0.774	−0.076	0.244	1.368	0.770	−0.151	0.245	2.022
House with no running water	−0.541	0.142	0.772	1.200	−0.539	0.202	0.772	1.319
South oblasts	0.498	0.152	0.786	0.878	0.502	0.196	0.786	0.854
Rural	0.830	0.100	0.287	0.747	0.830	0.112	0.288	0.724
Mountainous area	0.384	0.064	1.407	1.035	0.397	−0.006	1.432	0.997

Source: Authors' calculations based on KIHS 2012.

Table 6: Determinants of active labor market participation using a linear probability model with exogenous MBPF, 2012

	Marginal effects							
	All		*Poorest 40 %*		*All*		*Poorest 40 %*	
	Household head	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*
	Quarter 1				*Quarter 3*			
MBPF beneficiary	−0.058	−0.0058	−0.142*	−0.019	−0.092	0.022	−0.16***	0.022
	(0.063)	(0.036)	(0.077)	(0.047)	(0.061)	(0.035)	(0.057)	(0.082)
Male	0.269***	0.38***	0.288***	0.435***	0.267***	0.376***	0.279***	–
	(0.040)	(0.041)	(0.061)	(0.057)	(0.039)	(0.039)	(0.070)	
Number of children under 6	0.011	−0.062***	0.061	−0.035	0.015	−0.075***	0.034	−0.125**
	(0.026)	(0.021)	(0.046)	(0.032)	(0.025)	(0.019)	(0.035)	(0.050)
Number of children above 6 and below 18	0.031	0.011	0.065*	0.02	0.04**	−0.0032	0.067**	−0.0073
	(0.020)	(0.017)	(0.035)	(0.027)	(0.020)	(0.014)	(0.032)	(0.039)
Rural	0.0057	0.055**	0.104**	0.035	−0.024	0.046**	0.041	0.09
	(0.027)	(0.023)	(0.044)	(0.037)	(0.026)	(0.022)	(0.033)	(0.061)
South oblasts	−0.072***	−0.03	−0.037	−0.022	−0.03	−0.017	0.022	−0.059
	(0.027)	(0.022)	(0.044)	(0.032)	(0.024)	(0.021)	(0.033)	(0.053)
Receives money from relatives or work abroad	0.005	−0.065**	0.084	−0.094**	−0.047*	−0.078***	0.071	−0.146**
	(0.030)	(0.026)	(0.054)	(0.043)	(0.027)	(0.024)	(0.049)	(0.065)
Other control variables omitted								
Number of observations	2688	2076	950	803	2621	2045	923	792
F	18.670	12.020	8.280	4.900	20.930	13.730	9.660	5.540
Prob > *F*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Authors' calculations based on KIHS 2012.
Notes: Standard errors in parentheses; *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. (−) variable is a perfect predictor and has been omitted.

Table 7: Determinants of extended employment (including unpaid work) using a linear probability model with exogenous MBPF, 2012

Variables	*Marginal effects*							
	All		*Poorest 40 %*		*All*		*Poorest 40 %*	
Employed	*Household head*	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*
	Quarter 1				*Quarter 3*			
MBPF beneficiary	−0.145**	−0.061	−0.222***	−0.076	−0.087	0.052	−0.125*	0.082
	(0.062)	(0.043)	(0.075)	(0.058)	(0.067)	(0.041)	(0.068)	(0.060)
Male	0.15***	0.302***	0.115*	0.374***	0.271***	0.286***	0.249***	0.324***
	(0.041)	(0.041)	(0.061)	(0.053)	(0.039)	(0.044)	(0.071)	(0.072)
Number of children under 6	0.039	−0.068***	0.052	−0.04	0.043	−0.069***	0.072	−0.074**
	(0.031)	(0.021)	(0.043)	(0.034)	(0.032)	(0.020)	(0.045)	(0.035)
Number of children above 6 and below 18	0.058***	0.0087	0.057*	0.011	0.069***	0.00085	0.074**	−0.007
	(0.021)	(0.017)	(0.030)	(0.029)	(0.021)	(0.017)	(0.031)	(0.029)
Rural	0.02	0.1***	0.085*	0.071*	0.036	0.122***	0.11**	0.128***
	(0.032)	(0.023)	(0.048)	(0.041)	(0.034)	(0.024)	(0.053)	(0.045)
South oblasts	−0.098***	−0.013	−0.036	−0.026	−0.074**	−0.014	−0.0031	−0.0064
	(0.031)	(0.023)	(0.046)	(0.037)	(0.033)	(0.024)	(0.047)	(0.036)
Receives money from relatives or work abroad	−0.041	−0.07**	0.05	−0.075	−0.034	−0.075***	0.047	−0.085*
	(0.031)	(0.028)	(0.051)	(0.046)	(0.031)	(0.028)	(0.050)	(0.048)
Other control variables omitted								
Number of observations	2594	1,962	915	755	2530	1926	886	740
F	4.470	9.090	1.910	4.360	9.700	9.680	6.380	4.160
Prob > *F*	0.000	0.000	0.029	0.076	0.000	0.000	0.000	0.000

Source: Authors' calculations based on KIHS 2012.
Notes: Standard errors in parentheses; *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Table 8: Determinants of informal work for employed (extended definition) using a linear probability model with exogenous MBPF, 2012

Variables	*Marginal effects*							
	All		*Poorest 40 %*		*All*		*Poorest 40 %*	
Employed	*Household head*	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*
	Quarter 1				*Quarter 3*			
MBPF beneficiary	0.138*	0.336***	0.016	0.534***	0.139**	0.311***	0.016	0.519***
	(0.071)	(0.104)	(0.078)	(0.130)	(0.067)	(0.097)	(0.082)	(0.099)
Male	0.018	0.015	−0.032	−0.02	0.032	0.004	0.019	0.067
	(0.043)	(0.118)	(0.073)	(0.130)	(0.044)	(0.110)	(0.077)	(0.122)
Number of children under 6	0.051*	0.0056	0.056	−0.028	0.052*	0.0038	0.065	−0.026
	(0.029)	(0.046)	(0.041)	(0.066)	(0.029)	(0.045)	(0.041)	(0.061)
Number of children above 6 and below 18	0.035	0.013	0.03	0.038	0.02	0.022	0.036	0.061
	(0.022)	(0.034)	(0.032)	(0.048)	(0.023)	(0.034)	(0.033)	(0.045)
Rural	0.013	0.12***	−0.0019	0.093	0.0021	0.118***	−0.026	0.055
	(0.034)	(0.044)	(0.054)	(0.072)	(0.034)	(0.046)	(0.052)	(0.068)
South oblasts	−0.025	0.031	−0.054	−0.035	−0.01	0.0085	−0.027	−0.0043
	(0.033)	(0.046)	(0.049)	(0.063)	(0.033)	(0.047)	(0.049)	(0.059)
Receives money from relatives or work abroad	−0.058	0.101	−0.0045	0.251***	−0.068*	0.126*	−0.058	0.404***
	(0.038)	(0.063)	(0.061)	(0.090)	(0.039)	(0.066)	(0.062)	(0.073)
Other control variables omitted								
Number of observations	2214	1352	749	432	2248	1395	773	473
F	2.770	4.180	1.820	3.070	4.520	3.480	2.770	5.360
Prob > *F*	0.001	0.000	0.040	0.000	0.000	0.000	0.001	0.000

Source: Authors' calculations based on KIHS 2012.
Notes: Standard errors in parentheses; *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Table 9: Determinants of work intensity using a Heckman selection model with exogenous MBPF, 2012

Variable	*All*		*Poorest 40 %*		*All*		*Poorest 40 %*	
Hours worked (ln)	*Household head*	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*	*Household head*	*Spouse*
	Quarter 1				*Quarter 3*			
MBPF beneficiary	−0.035	−0.558**	−0.034	−0.189	−0.041	0.035	0.100	−0.073
	(0.124)	(0.269)	(0.139)	(0.216)	(0.066)	(0.099)	(0.068)	(0.158)
Wage per hour (ln)	0.264***	0.338***	0.422***	0.527***	0.076***	0.176***	0.097***	0.178***
	(0.031)	(0.042)	(0.060)	(0.089)	(0.017)	(0.030)	(0.027)	(0.046)
Male	0.052	0.509***	−0.145	0.848***	0.108***	0.309***	0.046	0.232**
	(0.068)	(0.118)	(0.113)	(0.240)	(0.041)	(0.090)	(0.072)	(0.116)
Number of children under 6	−0.173***	−0.214**	−0.143*	−0.247**	−0.099***	−0.206***	−0.107***	−0.254***
	(0.043)	(0.089)	(0.073)	(0.124)	(0.029)	(0.067)	(0.040)	(0.071)
Number of children above 6 and below 18	−0.078**	0.015	−0.102**	−0.053	−0.069***	−0.011	−0.045	−0.066
	(0.036)	(0.062)	(0.052)	(0.077)	(0.022)	(0.041)	(0.030)	(0.049)
Other control variables omitted								
Athrho	0.146	0.431***	0.449**	0.676*	0.112*	0.277***	0.294	0.297**
	(0.128)	(0.135)	(0.182)	(0.383)	(0.058)	(0.078)	(0.181)	(0.139)
lnsigma	−0.534***	−0.260***	−0.421***	−0.192	−0.928***	−0.423***	−0.933***	−0.557***
	(0.040)	(0.049)	(0.073)	(0.130)	(0.052)	(0.062)	(0.074)	(0.075)
Lambda = inv. Mills ratio	0.085	0.313	0.276	0.486	0.044	0.177	0.112	0.166
	(0.075)	(0.098)	(0.114)	(0.265)	(0.023)	(0.054)	(0.069)	(0.079)
Number of observations	2353	1805	806	688	2473	1813	867	702
Wald χ^2 (10)	117.310	138.320	66.040	92.090	62.730	89.440	33.550	59.440
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Authors' calculations based on KIHS 2012.
Notes: Standard errors in parentheses; *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Table 10: Determinants of MBPF participation using a linear probability model, 2012

	Quarter 1		*Quarter 3*	
	Household head	*Spouse*	*Household head*	*Spouse*
MBPF recipient				
Male	−0.300	−1.76**	−0.266	−1.600**
	(0.240)	(0.752)	(0.246)	(0.665)
Age	0.070	0.121	0.123*	0.072
	(0.089)	(0.082)	(0.073)	(0.094)
Age sq	−0.001	−0.002*	−0.002**	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Household size	0.676*	0.767	0.631*	0.805*
	(0.345)	(0.483)	(0.361)	(0.489)
Number of children under 6	0.502**	0.226	0.483**	0.198
	(0.218)	(0.213)	(0.223)	(0.223)
Number of children above 6 and below 18	0.393	0.123	0.353	0.175
	(0.291)	(0.352)	(0.284)	(0.350)
House walls not made from brick or concrete	1.02***	0.773***	1.04***	0.764***
	(0.240)	(0.241)	(0.242)	(0.241)
House with no running water	0.071	−0.060	0.114	−0.065
	(0.192)	(0.218)	(0.197)	(0.219)
South oblasts	0.716***	0.513***	0.771***	0.517***
	(0.135)	(0.149)	(0.136)	(0.149)
Rural	0.305	0.751***	0.297	0.725***
	−0.234	−0.193	−0.234	−0.198
Mountainous area	0.324**	0.298*	0.304**	0.311**
	(0.144)	(0.155)	(0.146)	(0.156)
N	2567	1945	2529	1926
F	9.220	6.800	8.860	6.760
Prob > *F*	0.000	0.000	0.000	0.000

Source: Authors' calculations based on KIHS 2012.