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**The effect of means-tested social transfers on labour supply:  
heads versus spouses - An empirical analysis of work  
disincentives in the Kyrgyz Republic**  
Franziska Gassmann and Lorena Zardo Trindade

**Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT)**

email: [info@merit.unu.edu](mailto:info@merit.unu.edu) | website: <http://www.merit.unu.edu>

**Maastricht Graduate School of Governance (MGSoG)**

email: [info-governance@maastrichtuniversity.nl](mailto:info-governance@maastrichtuniversity.nl) | website: <http://www.maastrichtuniversity.nl/governance>

Boschstraat 24, 6211 AX Maastricht, The Netherlands  
Tel: (31) (43) 388 44 00

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# The effect of means-tested social transfers on labour supply: heads versus spouses

## *An empirical analysis of work disincentives in the Kyrgyz Republic*

Franziska Gassmann<sup>1</sup> and Lorena Zardo Trindade<sup>2</sup>

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### *Abstract*

This paper empirically estimates potential work disincentives of a means-tested social transfer in the Kyrgyz Republic for adults with different household positions. Using data from the Kyrgyz Integrated Household Survey 2012, the analysis compares labour market outcomes for household heads and spouses. Binary response models and quasi-experimental methods are applied to assess the effect of the Monthly Benefit for Poor Families with Children (MBPF) on labour supply. The analysis indicates that overall beneficiaries have on average higher labour market participation rates when compared to non-beneficiaries, but they are more exposed to seasonal effects. Results differ when analysing different household members separately. Household heads in beneficiary households are less likely to be economically active than similar non-beneficiaries. Yet, spouses are more likely to be economically active. However, the effects differ depending on whether the household is located in the South or the North of the country.

Key words: social transfers, work disincentives, Kyrgyz Republic

JEL Codes: I38, J22

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<sup>1</sup> UNU-MERIT/MGSOG, Maastricht University; franziska.gassmann@maastrichtuniversity.nl

<sup>2</sup> Center for Social Policy Herman Deleeck, University of Antwerp

# 1. Introduction

The objective of social transfers is to help households in coping 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 programmes in the early 1990s, as poverty increased during the economic transition, popular perceptions prevail that the provision of income transfers to poor and vulnerable households (commonly called social assistance) creates work disincentives and leads to welfare dependence.<sup>3</sup> The empirical literature on the relationship between social assistance programmes and work disincentives provides mixed evidence depending on the type of country analysed. Evidence from developing countries indicates that social cash transfers have hardly any effects on adult labour supply (Banerjee et al., 2015; Bosch & Manacorda, 2012). Some studies even find a positive effect due to the re-allocation of labour within households resulting in an increase of adult labour participation (ILO, 2010). Evidence from Eastern Europe and Central Asia itself is still scarce finding both positive and negative effects depending on the country, the type of social transfer and the population group analysed.

The purpose of this paper is to estimate potential labour market disincentives of the Monthly Benefit for Poor Families with Children (MBPF) for adults holding different household positions in Kyrgyz Republic. The Kyrgyz Republic was the first Central Asian country to adopt a national poverty benefit in 1995 (World Bank, 2000). The Monthly Benefit for Poor Families with Children (MBPF) is the only social assistance transfer specifically targeted at extremely poor households with children. It is a means-tested transfer whereby eligibility depends on average family income being below the Guaranteed Minimum Income (GMI).

According to standard economic theory, income transfers reduce labour supply at the margin by raising the wage needed to attract these workers into the labour market. If leisure is a normal good, the transfer and the related marginal tax rate at the eligibility threshold lead to income and

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<sup>3</sup> Work (dis-)incentives commonly refer to changes in labor supply as a result of income transfers, while welfare dependence is concerned with the length of the welfare spell (Moffitt, 1992; Gottschalk & Moffitt, 1994)

substitution effects, both resulting in lower labour supply (Danziger et al. 1981).<sup>4</sup> The strict application of income criteria to poverty-targeted cash transfers is expected to negatively affect the labour 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. This is particularly an issue where benefit eligibility is assessed based on formal income (Packard et al., 2012). If income tests focus on formal income, beneficiaries may be pushed into the informal sector in order to maintain their benefit eligibility (Tesliuc et al., 2014; Bosch & Manacorda, 2012). Particularly those with low skills or working in low paid jobs have fewer incentives to graduate into fulltime (formal) work (Gotcheva & Sundaram, 2013). In situations with a high tax wedge on earned (formal) income, beneficiaries may opt for not working at all or staying in the informal sector to avoid withdrawal from social assistance (Koettl, 2013; Koettl & Weber, 2012).

Social transfers may lead to intra-household labour reallocation among working-age adults. Depending on the household position, adults respond differently to the receipt of benefits. Intra-household decisions on labour supply may be reconsidered once a household is eligible for transfers. Studies on intra-household decisions on labour supply became popular after Gary Becker's (1965) seminal work "A Theory of the Allocation of Time", in which he assumes that the household is a rational economic unit. According to Becker's approach, 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 behaviour, market equilibrium and stable preferences. The general formulation of Becker, however, did not differentiate leisure activities from domestic activities (Heckman, 2015).

Gronau (1977) proposed an extension to the Becker model incorporating time as an input in the production of goods and services consumed in the household. This model became known as the Becker-Gronau model and was a fundamental contribution to detach domestic labour from leisure. In this study, Gronau confirms several stylized facts about the distribution of labour supply within the household. Changes in the socioeconomic context, such as income, education and number of

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<sup>4</sup> This assumes elastic labor supply, an assumption which is rather unlikely to hold in many lower and middle income countries (Barrientos and Villa, 2015).

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 labour supply and, consequently, a reduction of time devoted to domestic activities and leisure. A change in the income of the spouses does not affect the labour supply of household heads, but if the change refers to the household head's wage rate, there is an increase in labour supply and a similar reduction in the spouse's labour supply. Gronau further concludes that the presence of children induces the mother to reallocate her time in the labour market to domestic activities. With respect to fathers, the main effect of the presence of children is his increased labour supply and time devoted to household chores, especially for parents with higher education levels and from non-paternalistic societies (Gronau, 1977).

The collective model for household consumption behaviour, developed by Chiappori (1988, 1992) has lately become popular for analysing intra-household decision making processes. Within this framework, household members interact with each other to make decisions through an exogenous unobservable process that produces a Pareto efficient allocation. Household preferences can be described by a weighted sum of individual preferences, in which the individual weights represent the bargaining power of household members. These preferences can be modified according to changes in prices, wages or household income from other sources. However, other factors can affect the intra-household allocation process, such as personal income from other sources. Chiappori (1992) developed the *sharing rule* function, which describes how income from other sources is distributed within the household and can be used to identify the individual preferences and intra-household allocation process. Several extensions of the collective model have been developed based on Chiappori's (1988, 1992) seminal work. These extensions contributed to the analysis of relevant aspects related to decisions on household labour supply. Chiappori et al. (2002) derived conditions to determine the *sharing rule* for household income from other sources between spouses. Chiappori (1997) and Apps and Rees (1997) formulated the collective model of labour supply and domestic production, in which home production was taken into account, implying that all unused time in the labour market is not interpreted as leisure.

Empirical studies on intra-household allocation decisions are still limited. However, given that in paternalist societies intra-household allocation decisions often reflect gendered outcomes, empirical findings from studies on the impact of social transfers on male and female labour 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 programme 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 & Sanchez-Paramo, 2014). Using data from the “Life in Kyrgyzstan” survey, Barrientos and Kudebayeva (2015) present ambiguous results of the MBPF on women depending on the data and models used.

The analysis in this paper compares labour market outcomes for household heads and spouses using data from the Kyrgyz Integrated Household Survey 2012. Quasi-experimental methods are applied to assess the effect of the Monthly Benefit for Poor Families (MBPF) on active labour market participation and employment. Contrary to other studies<sup>5</sup>, 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 percent of the population. In the Kyrgyz Republic, paternalistic structures are common within families and in wider society. Current market institutions and prevailing socio-cultural attitudes do not support the active involvement of women in economic activity. In addition, women’s economic behaviour is restrained by the lack of opportunities and the requirement to carry out their traditional family roles (World Bank, 2011). In this context, assuming that intra-household allocation decisions might be highly correlated to gender, it is essential to investigate whether means-tested social transfer have distinct effect on

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<sup>5</sup> Barrientos and Kudebayeva (2015) apply binary models to the cross-section and panel component of the Life In Kyrgyzstan data to analyze the effect of the MBPF on female labor market participation.

labour supply of adults with different household positions. The analysis indicates that overall beneficiaries have on average higher labour market participation rates when compared to non-beneficiaries, but they are more exposed to seasonal effects. Results differ when analysing different household members separately. Household heads in beneficiary households are less likely to be economically active than similar non-beneficiaries. 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 3 describes the data and methodology used for the empirical analysis. Section 4 presents and discusses the findings of the empirical analysis, and Section 5 concludes.

## **2. MBPF and potential work disincentives**

The Kyrgyz labour market is characterized by insufficient labour demand, high informality and a sizeable gender gap. Over the last decade, the labour force frequently grew more rapidly than the annual growth of employment. Approximately 70 percent of employment is informal, and almost two thirds of those working in the informal sector are self-employed. Under-employment is particularly an issue in rural areas. Although unemployment rates are lower in rural areas, the work intensity is less and seasonal employment is more frequent. The employment-to-population rate is considerably lower for women than for men. While male employment increased from 66.4 percent in 2003 to 70.7 percent in 2010, female employment levels remained unchanged. 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 non-contributory transfers and services which play an important role in helping individuals and families cope with income shocks. The MBPF is a means-tested, non-contributory 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.<sup>6</sup> The income assessment includes both formal and informal income. In addition to the recipient household's formal and informal 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 & Izmailov, 2011). In 2012, the GMI was equal to KGS 370 per month<sup>7</sup>, which reflected less than 30 percent of the extreme poverty line.<sup>8</sup>

Despite its potential to alleviate extreme poverty, which accounted for four percent of the population in 2012 (Mamadaliyev, 2014), and contribute to equalizing opportunities in the years of childhood, coverage of the extremely poor remains limited. The number of MBPF beneficiaries has been declining from 480 thousand beneficiaries in 2005, representing nine percent of the population, to 377,000 beneficiaries in 2011 (Mamadaliyev, 2014). Based on estimates derived from the Kyrgyz Integrated Household Survey (KIHS)<sup>9</sup>, 7.4 percent of the population lived in a beneficiary household in 2012 (Table 1). Coverage is highest among the poorest households with 13.3 percent of the population of the first (poorest 10 percent) and 19.4 percent of the population of the second decile covered. Although the allocation of the MBPF is progressive, more than 50 percent of total transfers are reaching the poorest 20 percent; more than 80 percent of extremely poor children below the age of 18 are not covered. Furthermore, the benefit provided by the programme is not sufficient to meet the most basic needs. In 2012, MBPF transfers accounted for 12.2 percent of total household consumption among the poorest households. Hence, the impact on poverty reduction is limited due to low coverage and benefit levels.

Income from wage remains the most important income source for Kyrgyz households. This applies both to the total population and to the group of MBPF beneficiaries. Income from wage accounts for 66.2 percent of total household income for MBPF beneficiary households, followed by pensions (16. percent). On average, the share of wage income is slightly higher for the poor and extremely

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<sup>6</sup> This has recently changed to a flat rate benefit.

<sup>7</sup> The equivalent of 19.36 USD PPP in 2012 (currency equivalent in international USD from IMF WEO, April 2015).

<sup>8</sup> The extreme (food) poverty line was KGS 1,286 per capita per month in 2012. The absolute poverty line was KGS 2,182 (NSC). The GMI is set by government decree depending on the available financial resources provided by the Ministry of Finance and expected number of beneficiaries.

<sup>9</sup> See next section for a description of the data.

poor, compared to the MBPF recipients (Table 2). This suggests that MBPF beneficiaries might behave differently on the labour market compared to other households that are equally poor. Table 2 also hints at the importance of informal transfers. In MBPF households, money from relatives and work abroad accounts for 20 percent of total household income, which is considerably more than compared to the average for all households (11.8 percent).

**Table 1. MBPF: coverage, distribution and adequacy by consumption decile, 2012**

Indicators	Deciles										Total
	1	2	3	4	5	6	7	8	9	10	
Coverage*	13.3	19.4	8.4	6.6	13.7	4.1	4.5	3.8	0.2	0.1	7.4
Distribution of benefits*	22.7	33.8	10.0	5.9	15.2	4.3	4.6	3.0	0.4	0.1	100.0
MBPF as % of total consumption (only recipients)**	12.2	9.6	6.0	4.1	4.6	4.1	3.6	2.4	4.8	2.0	7.2

\*Deciles are based on annual per capita consumption before transfers, assuming a marginal propensity to consume of 33%.

\*\*Deciles are based on annual per capita consumption after transfers.

Source: Authors' calculations based on KIHS 2012

**Table 2. Household income composition, by poverty status and MBPF receipt, 2012**

Components of total income <sup>1</sup>	in percent			
	Total population	Poor	Extremely-poor	MBPF beneficiaries
Wage	66.2	64.5	64.7	54.4
Agriculture activities	11.5	11.9	9.5	18.6
Pension	16.7	17.7	19.9	11.9
Money from relatives and work abroad <sup>2</sup>	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

Notes: (1) Income shares reflect the average shares across households.

Source: Authors' calculations based on KIHS 2012

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 reported for agriculture, hunting and forestry (KGS 5,454) (National Statistics Committee, [www.stat.kg](http://www.stat.kg)). The situation is different in the informal sector. Informal labour in agriculture 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](http://www.stat.kg)).

Given the low level of the GMI, the amount of MBPF benefits a household is maximally entitled to is considerably less than the wage this household could earn in the formal and most of the informal labour market. It is therefore unlikely that the MBPF a priori creates work disincentives, a conclusion which is also supported by Gotcheva and Sundaram for the Western Balkans (2013). **Table 3** compares different hypothetical households with respect to their earning potential and the GMI, which reflects the amount a household can receive per child if it has no income at all. In households with one working adult, the MBPF only exceeds the minimum wage if this household has three or more children. In case of two working adults and assuming that both earn the minimum wage, income from work exceeds transfer income. Employment in the formal and informal sector always pays off, with the exception of informal work in the agricultural sector, where the earning potential is clearly below a full MBPF transfer. Hence, based on the comparison of these standard situations, there is a potential for work disincentives for adults working informally in agriculture.

The design of the MBPF, whereby the transfer amount is equal to the gap between total family income per capita and the GMI, in principal imposes a 100 percent marginal tax rate on each additional Kyrgyz Som of reported income exceeding the GMI. However, the actual marginal tax rate may be different. It assumes that the means test is strictly applied with recertification in the event that the family income situation has changed. While this might be feasible for income from formal employment or other social transfers, it is administratively much more challenging to assess changes in informal income when households do not inform the local authorities of such changes. The fact that each additional Kyrgyz Som earned would reduce the MBPF transfer by one Kyrgyz Som may induce beneficiaries not to report additional income and may 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. MBPF recipients are exempted from paying state charges and fees, are eligible for free legal support, and are exempted from paying for the registration of a birth or issuance of a passport. Financially

disadvantaged citizens are exempted from co-payments for hospital care and children from poor families with four or more children are also eligible for free outpatient care. Local governments have the right to provide textbooks free of charge and exempt children from paying school fees. Finally, in Bishkek pre-school children from poor families are entitled for free school meals (Gassmann & Zardo Trindade, 2015).

**Table 3. Comparing potential incomes for model families**

Sources of income	Model 1: One working adult +			Model 2: Two working adults +		
	1 Child	2 Children	3 Children	1 Child	2 Children	3 Children
<b>Full or maximum MBPF</b>	<b>370</b>	<b>740</b>	<b>1,110</b>	<b>370</b>	<b>740</b>	<b>1,110</b>
Minimum wage	760	760	760	1,520	1,520	1,520
Average wage: formal sector	10,884	10,884	10,884	21,768	21,768	21,768
in agriculture, hunting and forestry activities	5,454	5,454	5,454	10,908	10,908	10,908
Average wage: informal sector	3,879	3,879	3,879	7,758	7,758	7,758
in planting production	230	230	230	460	460	460

*Source:* Based on data from National Statistics Committee ([www.stat.kg](http://www.stat.kg)).

### 3. 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, collecting data since 2003. Households participating in the KIHS are visited four times per year. The 2012 KIHS contains information on 5,000 households and is representative at the national and regional level. The survey provides detailed information on the demographic composition of the household, incomes, expenditures, housing, assets and labour. The labour module of the KIHS collects labour force data for present and migrant individuals 15 years and older at quarterly level. Due to seasonal events, it is likely that an individual's participation in the labour market varies throughout the year. Therefore, the information used for the labour market analysis is based on quarterly data, but only considers present individuals in the household. Although quarterly data is used for the analysis, the weights used for the estimations are annual weights. This does not compromise the analysis and might only lead to minor differences in estimations.

Labour force participation refers to the proportion of the working age population that is economically active: all individuals who supply labour for the production of goods and services, or are ready to work. In assessing the impact of cash transfers on work disincentives, the analysis considers different labour market outcomes. Active labour market participation includes both employed and unemployed individuals. Although the definition for employed individuals follows the ILO convention, it does not consider individuals engaged in unpaid informal activities. The analysis therefore uses a second labour 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 labour market outcome considers formal versus informal work.<sup>10</sup> The analysis of labour market outcomes of beneficiaries and non-beneficiaries focuses on the able-bodied working age population (aged 18-62 years old for men, and 18-57 for women), excluding full time students<sup>11</sup>, living in households with children under 18 years old, unless indicated otherwise. This group represents almost 40 percent of the total population in the Kyrgyz Republic. The position of household head is more common among men (74.4 percent), while spouses are generally women (96.5 percent) (Table 4).

The treatment group in the subsequent analysis comprises 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*' used throughout the text refers to all individuals living in a MBPF recipient household, unless otherwise indicated.

Active labour force participation rates for the total reference population (all able-bodied working age adults, excluding fulltime students, and living in households with children) are close to 80 percent over the year (Table 5).<sup>12</sup> Participation rates for MBPF beneficiaries are between 1.5 and 5 percentage points lower compared to the average. Given that the majority of beneficiaries lives in rural areas, the higher level of activity in the second and third quarter suggests that beneficiaries are more likely to be involved in agricultural activities than non-beneficiaries.

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<sup>10</sup> Informal work includes informal employment, informal self-employment and own production activities in case of unemployment or inactivity.

<sup>11</sup> 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.

<sup>12</sup> Differences for labor force participation rates across quarters are not statistically significant.

**Table 4. Share of the reference population in the total population, 2012**

	in percent
Population	Share of total population
Working age adult	53.6
Able-bodied working age adult	52.6
Able-bodied working age adult, not studying	49.0
Able-bodied working age adult, not studying, living in household with children under 18 years' old	38.5
	Share of reference group
Household head, able-bodied working age adult, not studying, living in household with children under 18 years' old, of which:	37.9
Male	74.4
Female	25.6
Spouse, able-bodied working age adult, not studying, living in household with children under 18 years' old, of which:	28.4
Male	3.5
Female	96.5

*Source:* Authors' calculations based on KIHS 2012.

Total labour force participation rates in the North are slightly higher than in the South.<sup>13</sup> Although, MBPF beneficiaries living in the North appear to have lower labour force participation rates compared to beneficiaries in the South, the difference is not statistically significant. This holds for all four quarters. Seasonal employment seems to have 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 percent in the first quarter and 78.6 percent 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 to 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 to those living in the South (Gassmann & Zardo Trindade, 2015).

<sup>13</sup> Differences for total labor force participation rates between north and south are statistically significant at 99% confidence level.

Unemployment rates in 2012 started at a relatively high 9.7 percent in the first quarter and declined to 5.5 percent at the end of the year. This reflects the overall economic situation in the Kyrgyz Republic. The 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 to the rest of the population (16.6 percent). However, in the second half of 2012, unemployment rates for beneficiaries were slightly below average.

Table 5. Labour force participation rates by quarter, 2012

in percent

Labour force status by quarter	Total			MBPF Beneficiaries		
	North	South	Total	North	South	Total
Active						
Q1	82.8	76.7	79.4	66.6	76.6	74.5
Q2	83.3	79.1	81.0	70.8	81.0	78.9
Q3	83.7	79.2	81.2	73.8	81.2	79.7
Q4	82.6	77.5	79.7	68.8	77.7	75.9
Employed*						
Q1	74.7	65.8	69.8	55.7	58.5	57.9
Q2	78.0	73.5	75.5	60.0	74.4	71.5
Q3	78.3	74.8	76.4	62.8	78.6	75.5
Q4	76.3	72.7	74.3	53.6	75.5	71.1
Unemployed						
Q1	8.1	10.9	9.7	10.8	18.1	16.6
Q2	5.4	5.6	5.5	10.7	6.6	7.4
Q3	5.4	4.4	4.9	11.0	2.6	4.2
Q4	6.3	4.8	5.5	15.2	2.1	4.8
Inactive						
Q1	17.2	23.3	20.6	33.4	23.5	25.5
Q2	16.7	20.9	19.0	29.3	19.0	21.1
Q3	16.3	20.8	18.8	26.2	18.8	20.3
Q4	17.4	22.5	20.3	31.2	22.3	24.1

Note: Includes only able-bodied adults of working age, not studying, living in households with children.

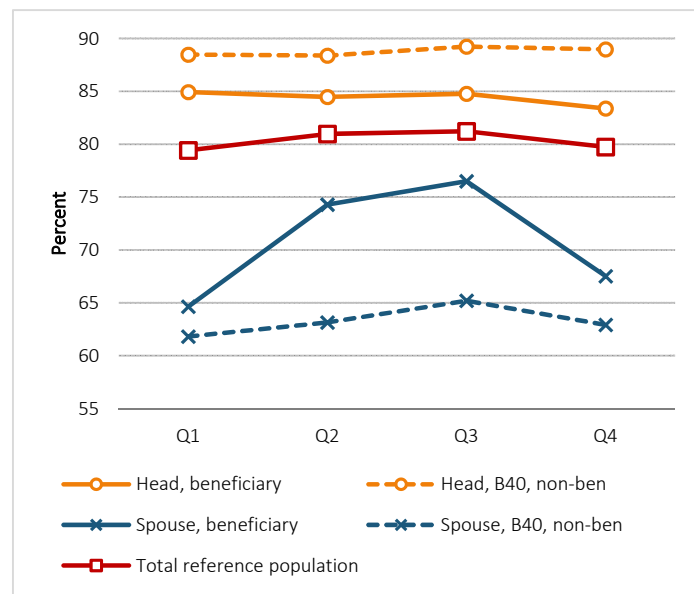
\* Standard definition of employment, without including unpaid work.

Source: Authors' calculations based on KIHS 2012

As Figure 1 shows, labour force participation rates differ substantially by household position. Household heads are more active in the labour market than spouses and they are less affected by seasonal variations. While household heads' rates remain above 80 percent throughout the year, the rate for spouses varies from 64.6 percent in the first quarter to 76.5 percent in the

third quarter. 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 non-beneficiary households.

**Figure 1. Active labour force participation of heads and spouses, Q1-Q4, 2012**



Note: Includes only working age able-bodied adults, not studying, living in households with children.

Source: Authors' calculations based on KIHS 2012.

The analysis in this study empirically assesses the potential existence of adverse incentives for labour force participation for adult MBPF beneficiaries with different household positions. In order to understand whether certain characteristics are more likely to induce the presence or absence from the labour market, different econometric models will be applied. As a first step, we use binary response models to test whether able-bodied adults living in MBPF beneficiary households are more or less likely to participate in the labour market. The analysis focuses on three different outcomes: (i) active labour market participation, (ii) extended employment (including unpaid work), and (iii) participation in informal work (including unpaid work). The results indicate which individual or household characteristics are positively or negatively correlated with labour market outcomes and to what extent seasonal influences matter. For the latter purpose, the models are estimated separately for quarter 1 (winter) and quarter 3 (summer). In the binary response model estimated



by maximum-likelihood probit models, 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 six 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. Given the pronounced differences in labour 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). At last, the three models are estimated again, but this time only including the bottom 40 percent of the welfare distribution, assuming that the determinants of labour market participation may differ for low-income households.

Given the limitations of the binary response models to draw conclusions about the impact of MBPF receipt on labour force participation, a quasi-experimental design is used to establish an adequate counterfactual to isolate effects from programme participation. According to Khandker, Koolwal & Samad (2009), several quasi-experimental approaches can be used to evaluate programme effects and assess whether changes in well-being or behaviour are the result of the programme intervention or other factors. 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 labour market outcomes of these two groups, we will be able to analyse whether or not the MBPF creates work disincentives. The Propensity Score Matching model estimates the Average Treatment Effect (ATT) of the treated (i.e. MBPF receipt) on labour market outcomes<sup>14</sup> according to the following model specification:

$$LM_i = \beta_0 + \beta_1 T_i + \beta_2 X + u_i ,$$

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<sup>14</sup> The Average Treatment Effect (ATT) of the treated is estimated by Stata's programme *teffects psmatch*.

for which  $LM_i$  refers to the labour market outcome for able-bodied working age adults;  $T_i$  is the identifier for MBPF beneficiary (treatment group);  $X$  is the vector of variables used for the matching; and  $u_i$  is the error term. The coefficient  $\beta_1$ , estimated for the benefit variable, describes the effect of the MBPF on labour market outcomes. This coefficient is the average treatment effect on the treated (ATT), and it measures the heterogeneity of the impact via interaction with other variables.

The quasi-experimental analysis will be applied separately for each quarter of 2012, as seasonal effects are likely to have an effect on labour market outcomes. In addition to the quarterly analysis, the model will also consider the hypothesis that labour market outcomes of MBPF beneficiaries differ for heads and spouses, given their position in the household. To test the hypothesis that the MBPF programme might have different impacts according to the location of a household, the sample will be further divided into households living in the North and households living in the South of the country. The PSM model considers individual and household characteristics to estimate the impact of receiving the MBPF on labour 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, presence of children between 6 and 18 years old), housing conditions (walls, water)<sup>15</sup>, and household location (rural area, mountainous area, and south region). Table 10 (see annex) provides summary statistics for the variables included in the analysis.

## 4. Results

### Determinants of labour outcomes

In order to assess whether MBPF receipt indeed affects labour market outcomes the analysis has to go beyond a simple comparison of group averages. We first consider the determinants of active labour market participation, extended employment and the likelihood of doing informal work using binary response models estimated with maximum-likelihood probit models. Active labour market participation and other labour market outcomes are determined by individual and household characteristics, and possibly by the receipt of formal and informal transfers. The latter

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<sup>15</sup> House walls not made from brick or concrete; house with no running water.

may reduce the need to be active and generate income. In order to capture possible variations in the relevance of different determinants for household heads and spouses, the models are estimated separately for each group. Given that the majority of MBPF beneficiaries belongs to the poor, estimates are also provided for heads and spouses belonging to the bottom 40 percent of the population. Moreover, using the availability of quarterly labour force data, the models are estimated for the first and third quarter separately providing further insights into seasonal effects.

Based on the results from the binary models, receiving an MBPF transfer is neither negatively nor positively correlated with active labour market participation irrespective of the individual's household position (Table 6). The only exception are household heads in MBPF recipient households that are less likely to be active in the first and third quarters compared to other poor heads. The strongest determinant which is positively correlated with active labour force participation across all models is gender. Male household heads are between 27 and 29 percentage points more likely to be active. This is hardly a surprising result given that in most countries men have higher labour market participation rates than women (see, e.g., Verick, 2014). Lower educational attainment of women, social norms regarding women's position in the society, and, maybe most importantly, care duties of women are among the most frequently cited reasons explaining the gender gap in labour market participation (Verick, 2014; Thévenon, 2013). Female participation rates may however be underestimated if unpaid work and domestic activities are not included in labour market statistics (Verick, 2014). Given that the size of the MBPF depends on the number of children in eligible households, the presence of more children may result in 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 labour market, irrespective of the specific outcome analysed. On the other hand, an increasing number of children aged 6 to 18 has a weak but positive effect on the labour market participation of household heads. Given that spouses are mainly female; inactivity may be a deliberate choice in order to care for the 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. The finding is also in line with Gronau's (1977) observation that the presence of children induces fathers to increase their labour supply. The relation between

active labour 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 labour 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. Finally, informal transfers, such as remittances, have a negative effect on labour market participation, particularly for spouses.

In Table 7, the analysis uses extended employment (including unpaid work) as labour 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. It supports the argument made above, that standard labour market definitions may underestimate female labour market participation given that the 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. Informal transfers also lose most of their significance for spouses in poor household once unpaid work is included in the labour outcome variable.

Finally, the last set of binary response models considers determinants of informal work, including unpaid activities (Table 8). 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 percent of spouses being female, these results may reflect gender-based preferences. One of the concerns about means-tested social assistance programmes relates to the potential risk of such transfers to 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 & Sundaram, 2013; Koettl & 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 percent, which is significantly higher than in most countries in the Western Balkan. The argument that particularly individuals with low levels of education and low skills are pushed into informality (Koettl, 2013) does not hold either. Compared to individuals with only completed primary education, incomplete general secondary or less, adults that completed general secondary education or higher are neither less nor more likely to work in the informal sector. 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.

Table 6. Determinants of active labour market participation (probit), 2012

	<i>Marginal effects</i>							
	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 (0.0630)	-0.0058 (0.0360)	-.142* (0.0770)	-0.019 (0.0470)	-0.092 (0.0610)	0.022 (0.0350)	-.16*** (0.0570)	0.022 (0.0820)
Male	.269*** (0.0400)	.38*** (0.0410)	.288*** (0.0610)	.435*** (0.0570)	.267*** (0.0390)	.376*** (0.0390)	.279*** (0.0700)	-
number of children under 6	0.011 (0.0260)	-.062*** (0.0210)	0.061 (0.0460)	-0.035 (0.0320)	0.015 (0.0250)	-.075*** (0.0190)	0.034 (0.0350)	-.125** (0.0500)
number of children above 6 and below 18	0.031 (0.0200)	0.011 (0.0170)	.065* (0.0350)	0.02 (0.0270)	.04** (0.0200)	-0.0032 (0.0140)	.067** (0.0320)	-0.0073 (0.0390)
Rural	0.0057 (0.0270)	.055** (0.0230)	.104** (0.0440)	0.035 (0.0370)	-0.024 (0.0260)	.046** (0.0220)	0.041 (0.0330)	0.09 (0.0610)
south oblasts	-.072*** (0.0270)	-0.03 (0.0220)	-0.037 (0.0440)	-0.022 (0.0320)	-0.03 (0.0240)	-0.017 (0.0210)	0.022 (0.0330)	-0.059 (0.0530)
receives money from relatives or work abroad	0.005 (0.0300)	-.065** (0.0260)	0.084 (0.0540)	-.094** (0.0430)	-.047* (0.0270)	-.078*** (0.0240)	0.071 (0.0490)	-.146** (0.0650)
	Other control variables omitted							
Number of observations	2688	2076	950	803	2621	2045	923	792
F	18.67	12.02	8.28	4.90	20.93	13.73	9.66	5.54
Prob > F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01. (-) variable is a perfect predictor and has been omitted.

Source: Authors' calculations based on KIHS 2012

Table 7. Determinants of extended employment (including unpaid work) (probit), 2012

*Marginal effects*

	All		Poorest 40%		All		Poorest 40%	
	Household head	Spouse	Household head	Spouse	Household head	Spouse	Household head	Spouse
	<i>Quarter 1</i>				<i>Quarter 3</i>			
MBPF beneficiary	-.145** (0.0620)	-0.061 (0.0430)	-.222*** (0.0750)	-0.076 (0.0580)	-0.087 (0.0670)	0.052 (0.0410)	-.125* (0.0680)	0.082 (0.0600)
Male	.15*** (0.0410)	.302*** (0.0410)	.115* (0.0610)	.374*** (0.0530)	.271*** (0.0390)	.286*** (0.0440)	.249*** (0.0710)	.324*** (0.0720)
number of children under 6	0.039 (0.0310)	-.068*** (0.0210)	0.052 (0.0430)	-0.04 (0.0340)	0.043 (0.0320)	-.069*** (0.0200)	0.072 (0.0450)	-.074** (0.0350)
number of children above 6 and below 18	.058*** (0.0210)	0.0087 (0.0170)	.057* (0.0300)	0.011 (0.0290)	.069*** (0.0210)	0.00085 (0.0170)	.074** (0.0310)	-0.007 (0.0290)
Rural	0.02 (0.0320)	.1*** (0.0230)	.085* (0.0480)	.071* (0.0410)	0.036 (0.0340)	.122*** (0.0240)	.11** (0.0530)	.128*** (0.0450)
south oblasts	-.098*** (0.0310)	-0.013 (0.0230)	-0.036 (0.0460)	-0.026 (0.0370)	-.074** (0.0330)	-0.014 (0.0240)	-0.0031 (0.0470)	-0.0064 (0.0360)
receives money from relatives or work abroad	-0.041 (0.0310)	-.07** (0.0280)	0.05 (0.0510)	-0.075 (0.0460)	-0.034 (0.0310)	-.075*** (0.0280)	0.047 (0.0500)	-.085* (0.0480)
	Other control variables omitted							
Number of observations	2,594	1,962	915	755	2,530	1,926	886	740
F	4.47	9.09	1.91	4.36	9.7	9.68	6.38	4.16
Prob > F	0.00	0.00	0.029	0.08	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Source: Authors' calculations based on KIHS 2012

Table 8. Determinants of informal work (probit) for employed (extended definition), 2012

	<i>Marginal effects</i>							
	All		Poorest 40%		All		Poorest 40%	
	Household head	Spouse	Household head	Spouse	Household head	Spouse	Household head	Spouse
	<i>Quarter 1</i>				<i>Quarter 3</i>			
MBPF beneficiary	-.145** (0.0620)	-0.061 (0.0430)	-.222*** (0.0750)	-0.076 (0.0580)	-0.087 (0.0670)	0.052 (0.0410)	-.125* (0.0680)	0.082 (0.0600)
Male	.15*** (0.0410)	.302*** (0.0410)	.115* (0.0610)	.374*** (0.0530)	.271*** (0.0390)	.286*** (0.0440)	.249*** (0.0710)	.324*** (0.0720)
number of children under 6	0.039 (0.0310)	-.068*** (0.0210)	0.052 (0.0430)	-0.04 (0.0340)	0.043 (0.0320)	-.069*** (0.0200)	0.072 (0.0450)	-.074** (0.0350)
number of children above 6 and below 18	.058*** (0.0210)	0.0087 (0.0170)	.057* (0.0300)	0.011 (0.0290)	.069*** (0.0210)	0.00085 (0.0170)	.074** (0.0310)	-0.007 (0.0290)
rural	0.02 (0.0320)	.1*** (0.0230)	.085* (0.0480)	.071* (0.0410)	0.036 (0.0340)	.122*** (0.0240)	.11** (0.0530)	.128*** (0.0450)
south oblasts	-.098*** (0.0310)	-0.013 (0.0230)	-0.036 (0.0460)	-0.026 (0.0370)	-.074** (0.0330)	-0.014 (0.0240)	-0.0031 (0.0470)	-0.0064 (0.0360)
receives money from relatives or work abroad	-0.041 (0.0310)	-.07** (0.0280)	0.05 (0.0510)	-0.075 (0.0460)	-0.034 (0.0310)	-.075*** (0.0280)	0.047 (0.0500)	-.085* (0.0480)
	Other control variables omitted							
Number of observations	2,594	1,962	915	755	2,530	1,926	886	740
F	4.47	9.09	1.91	4.36	9.7	9.68	6.38	4.16
Prob > F	0.00	0.00	0.029	0.08	0.00	0.00	0.00	0.00

Notes: Standard errors in parentheses; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Source: Authors' calculations based on KIHS 2012



### Average treatment effects

Given that the binary analysis above does not allow assessing the impact of MBPF receipt on labour market outcomes, quasi-experimental analysis is used to establish a counterfactual which allows matching MBPF beneficiaries with similar non-beneficiaries. Using Propensity Score Matching (PSM), control groups are created for each sub-group of the population (household position and location).<sup>16</sup> This approach allows disentangling the impact of the MBPF on labour market outcomes for different groups. Table 9 presents the estimated average treatment effects for each sub-group.

The analysis shows that the position in the household and the location of the household matter for the effect of MBPF receipt on labour 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 non-beneficiaries throughout the year, on the other hand, spouses are more likely to be economically active during the warmer months (quarters two and three). 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 eight percentage points less likely to active in quarters one and four, and between two and five percentage points more likely to be active in quarter two and three. The country-level analysis masks stark differences between regions in the North and the South of the country. The MBPF negatively affects labour market participation in the North, particularly for spouses and throughout the year. On the other hand, the MBPF results in significantly higher labour market participation among spouses in the South, except for the last quarter. Using 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.

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<sup>16</sup> Across quarters, treatment and control groups remain the same as individual and household characteristics are based on the situation in the first quarter.

Table 9. Average treatment effect (ATT) of MBPF participation on labour market outcomes, 2012

Sample	Outcome variable for the ATT			
	Active		Employed (extended definition)	
	Household head	Spouse	Household head	Spouse
<b>All</b>				
Q1	-0.076*** (0.004)	-0.075*** (0.006)	-0.193*** (0.005)	-0.237*** (0.005)
Q2	-0.046*** (0.005)	0.054*** (0.006)	-0.046*** (0.006)	0.073*** (0.006)
Q3	-0.057*** (0.004)	0.024*** (0.005)	-0.097*** (0.004)	0.091*** (0.005)
Q4	-0.013*** (0.003)	-0.085*** (0.005)	-0.059*** (0.004)	-0.031*** (0.006)
<b>North</b>				
Q1	-0.004* (0.002)	-0.435*** (0.009)	-0.145*** (0.007)	-0.316*** (0.008)
Q2	0.102*** (0.006)	-0.281*** (0.011)	0.049*** (0.008)	-0.302*** (0.010)
Q3	-0.005 (0.003)	-0.221*** (0.011)	0.054*** (0.005)	-0.205*** (0.011)
Q4	-0.017*** (0.002)	-0.200*** (0.007)	-0.181*** (0.006)	-0.090*** (0.011)
<b>South</b>				
Q1	-0.103*** (0.004)	0.102*** (0.005)	-0.245*** (0.005)	0.004 (0.005)
Q2	-0.027*** (0.005)	0.258*** (0.005)	-0.077*** (0.005)	0.223*** (0.006)
Q3	-0.021*** (0.006)	0.125*** (0.005)	-0.062*** (0.006)	0.367*** (0.005)
Q4	0.006 (0.005)	0.003 (0.005)	-0.102*** (0.004)	0.127*** (0.005)

Note: Standard errors in parentheses. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Source: Authors' calculations based on KIHS 2012

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. It tests if the matching characteristics used to estimate the propensity score balances

between treatment and comparison group units.<sup>17</sup> The test results indicate that most of the standardized differences and variance ratios for the covariates are often closer to the expected values of zero and one (Table 11 in the annex). Diagnostic kernel density plots using the matched propensity score distributions appear to be balanced (Figure 2 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 able-bodied working age employed adults are omitted since they are similar to the one below.

Based on economic theory, we have expected the MBPF to negatively affect labour 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 the year considered. Although the eligibility criteria are strictly applied, the analysis of the targeting performance indicated that also non-poor 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 & Ismailov, 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. The latter may explain why we see changes in the relation between benefits and participation and why the effects are often stronger in case of the extended definition of employment, assuming that spouses, which are mainly women, engage in unpaid activities related to subsistence agriculture.

The opposite findings for heads and spouses provides support to the theory that additional income leads to intra-household reallocation of labour 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 the South of the

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<sup>17</sup> For that, 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.

country. It is indeed as if the Kyrgyz Republic is not one, but two countries (Pannier, 2010). Compared to the empirical findings from other countries in the region that analysed 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 & 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 neighbouring 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.

## 5. Conclusion

The Monthly Benefit for Poor Families with Children (MBPF) is the only social assistance 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 being below the Guaranteed Minimum Income (GMI). Although the design of the MBPF implies a 100 percent marginal tax rate for every additional Kyrgyz Som earned above the GMI, the likelihood of potential work disincentives is limited considering the low benefit levels. In 2012, MBPF benefits represent less than 30 percent of the extreme poverty line; they are considerably below the official minimum wage and even more to what adults can earn in the formal and informal sector. While social assistance benefits can create labour market disincentives, in most 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 & Sanchez-Paramo, 2014).

Overall, the analysis in this paper indicates that the MBPF creates disincentives for labour force participation for specific groups of the working age population. The effect of the MBPF is negative for household heads throughout most of the year and only loosely related to location. However, for spouses, location matters. Spouses in MBPF households in the South have better labour outcomes compared to non-recipients, while the effect is opposite in Northern provinces. Seasonal effects have some impact on labour force participation. This is closely related to the fact that MBPF beneficiaries predominantly live in rural areas and are engaged in farming activities, which are rather seasonal. Inactive MBPF recipients are mainly engaged with housekeeping and childcare.

Regional and seasonal effects on labour market outcomes should be further investigated. The analysis in this paper indicates that the labour market in the Kyrgyz Republic follows a seasonal pattern with more work opportunities during the summer months. This has implications for able-bodied individuals looking for work. Despite high levels of labour market participation both among MBPF beneficiaries and non-beneficiaries, making ends meet remains difficult for many households given the low wages in the agricultural sector, where most of the poor in rural areas are engaged.

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## Annex

Table 10. Summary statistics for variables used in the analysis

Variables *	Household head					Spouse				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
MBPF beneficiary household	2594	0.070	0.25	0	1	1962	0.07	0.26	0	1
Male	2594	0.759	0.43	0	1	1962	0.03	0.17	0	1
Age (years)	2594	45.031	8.19	18	62	1962	41.33	8.24	19	61
Education - higher or general secondary degree	2594	0.968	0.18	0	1	1962	0.97	0.16	0	1
Household size (ln)	2594	1.449	0.34	1	2	1962	1.53	0.27	1	2
Number of children under 6	2594	0.598	0.772609	0	4	1962	0.63	0.77	0	4
HH has at least on child under 6	2594	0.443	0.50	0	1	1962	0.47	0.499253	0	1
Number of children above 6 and below 18	2594	1.584	1.036209	0	6	1962	1.66	1.06	0	5
HH has at least on child above 6 and below 18	2594	0.868	0.34	0	1	1962	0.876	0.329498	0	1
Rural area	2594	0.434	0.50	0	1	1962	0.45	0.50	0	1
Southern oblasts	2594	0.396	0.49	0	1	1962	0.38	0.49	0	1
Mountainous area	2594	0.350	0.476952	0	1	1962	0.36	0.48	0	1
HH receives money from relatives or work abroad	2594	0.231	0.42	0	1	1962	0.196	0.397245	0	1
House: walls not made from brick or concrete	2567	0.624	0.48	0	1	1945	0.65	0.48	0	1
House with no running water	2594	0.495	0.50	0	1	1962	0.48	0.50	0	1
Active labour 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

\*Variables refer to quarter 1 unless indicated otherwise.

Source: Authors' calculations based on KIHS 2012.

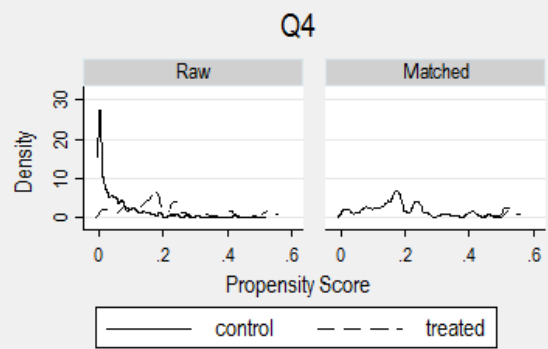
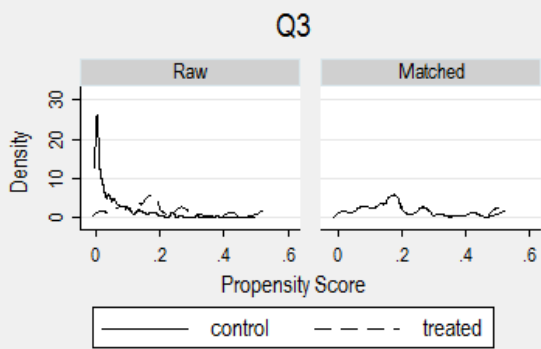
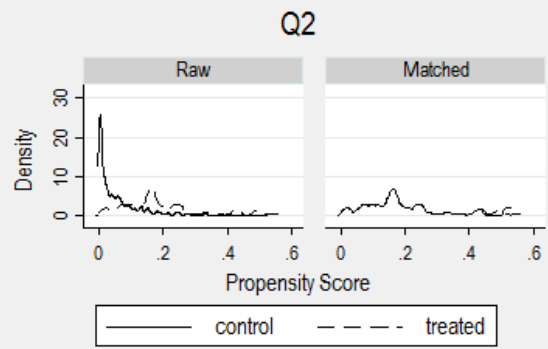
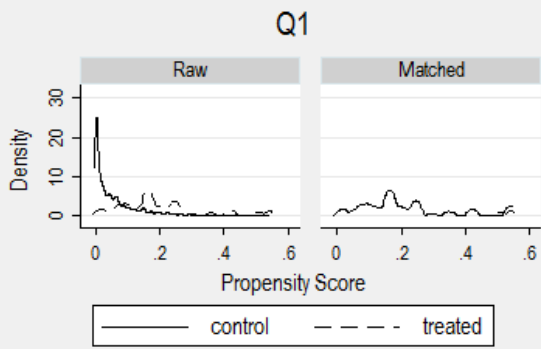


**Table 11. Covariate balance summary of the propensity score for active labour market participation**

Variable used for matching	Q1				Q3			
	Standardized differences		Variance ratio		Standardized differences		Variance ratio	
	Raw	Matched	Raw	Matched	Raw	Matched	Raw	Matched
<b><i>Household head</i></b>								
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
<b><i>Spouse</i></b>								
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.

**Figure 2. Diagnostic kernel density distribution of the propensity score for active labour market participation**



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