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The Impacts of Cash Transfers on Subjective Wellbeing and Poverty: The Case of Colombia

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Abstract
Cash transfer programs have been the main social policy in the fight against poverty and inequality in Latin-American countries. This paper analyzes the impacts of the program *Más Familias en Acción* on the perception of poverty and subjective wellbeing in Colombia. The analyses are based on data from the *Encuesta Nacional de Calidad de Vida* between 2008 and 2016. Two empirical strategies were compared to account for the lack of randomness in groups of beneficiary and non-beneficiary families: (i) non-experimental designs (linear and nonlinear models with cross-sectional and pooled data); (ii) quasi-experimental designs (*Propensity Score Matching* and *Inverse Probability Weighted Regression Adjustment*). The results were robust to the different empirical strategies and emphasized that: (i) transfers increase the perception of food insecurity and subjective poverty; (ii) conditionalities involve positive impacts on different indicators of subjective wellbeing, especially health and education; (iii) general impacts on the perceptions of life are nonsignificant, as a result of divergent impacts on the dimensions of the subjective wellbeing of families.

Keywords Subjective poverty · Subjective wellbeing · Public policies · Impact assessment · Matching

Introduction

Conditional cash transfer (CCT) programs are among the most successful social policy strategies in the fight against poverty and inequality in developing countries. Several studies have highlighted their positive impacts on social indicators, including health, education, child and adolescent nutrition, household consumption, child labor, poverty, vulnerability, and inequality (Burlandy 2007; Cacciamali et al. 2010; Melo and Duarte 2010; Rocha 2011; Trevisani and Jaime 2012).

The assessment of CCT impacts has been based mainly on objective indicators, such as school attendance, anthropometric measures, poverty rate, and labor market indicators. While objective measures are useful to assess aspects related to living and working conditions, subjective wellbeing (SWB) indicators have the ability to assess people's own perceptions about their social environment (Gori-Maia 2013; Grable et al. 2013) In this sense, SWB indicators would provide valuable information to develop, plan, and evaluate public policies targeted to reduce poverty and inequality (Van Praag and Ferrer-i-Carbonell 2008).

Few studies have assessed CCT impacts on people's SWB. The evidence is not conclusive either way. Some studies suggest that CCTs would increase financial insecurity and poverty perception (Dabalen et al. 2008). Others suggest positive impacts on the perception of poverty, caused mainly by changes in beneficiary household consumption patterns (Martorano et al. 2014). On the other hand, the conditionalities imposed by CCTs could have indirect and positive impacts on the perception of wellbeing in dimensions related, for example, to life satisfaction, autonomy, community social participation, and family interaction and acceptance (Attah et al. 2016).

This study assesses CCT impacts on the perception of poverty and subjective wellbeing in Colombia. We analyze the case of the program *Más Familias en Acción* (MFA) using microdata from the *Encuesta Nacional de Calidad de Vida* [National Survey of Quality of Life] (ENCV) from 2008 to 2016, which provides a rich base of information on living conditions, perception of poverty and subjective

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indicators in Colombia. MFA is the most important component of Colombia's Social Promotion System, aimed at enabling the poorest to have access to their fundamental rights and to the social protection system. In 2016, more than 2.5 million families received cash incentives for health and education; 1.2 million children under seven received medical follow-up; and 3.1 million school-age children benefited from the educational system (DNP 2017).

To account for lack of randomness in groups of MFA beneficiary and non-beneficiary families, two groups of empirical strategies were compared: (i) non-experimental designs, using linear and nonlinear models with cross-sectional and pooled data; (ii) quasi-experimental designs, using the *Propensity Score Matching* (PSM) and the *Inverse Probability Weigthed Regression Adjustment* (IPWRA) methods. Estimates were robust to the different strategies and suggest that, although MFA has negative impacts on the perception of poverty, food and income insecurity, this program exerts positive impacts on other important dimensions of subjective wellbeing, such as health and education.

Background

Subjective Wellbeing

Poverty can have two main meanings (Saunders 2003): a meaning for those who study poverty; and a meaning for those who experience poverty. The first approach has dominated the discussion in the literature and is known as objective poverty, oriented for defining poverty lines based fundamentally on income. The second is a subjective measure of poverty. It considers that poverty is closely related to its consequences, focusing on the individuals' perception about their own living conditions. In other words, objective measures analyzes intrinsic material characteristics, whereas subjective indicators analyzes perceptions about people's reality (Grable et al. 2013).

Objective and subjective indicators have their discrepancies and limitations. Nonetheless, the latter is able to assess more general aspects of living conditions and should play an important role in the evaluation of economic and social development (Graham 2005; Schimmel 2009). SWB analysis also attracted considerable attention in the behavioral sciences, covering studies related to happiness, satisfaction, state of mind, and positive affect (Attah et al. 2016).

In general, SWB has been considered a retrospective judgment that captures overall assessments of people's lives and feelings (Diener 1996). SWB also incorporates cognitive and affective aspects. The cognitive component is related to satisfaction with life, both globally and in specific domains (Diener 1994; Diener et al. 1999, 2003). It is based on standards that determine what a good way of life would be for an individual. The affective component refers to the emotional state, that is, the presence of positive feelings resulting from a particular event, which is usually referred to as happiness (Arita 2006; Cummins 2016).

Dolan et al. (2011) have recommended the use of SWB measures for evaluation of public policies, since these indicators provide a broader understanding of a social problem. In this sense, SWB measures would also be used to recommend public policies which could bring social improvements in Pareto's sense (Veenhoven 1996). Moreover, the measurement of SWB indicators is complementary, and sometimes superior to income as a criterion for public policy evaluation (Dolan and Peasgood 2008), since it is also related to institutional aspects as the quality of governance, the size of social capital, the rule of law, and the structure of the values and beliefs of a society (Siposné 2011).

Subjective Wellbeing and Conditional Cash Transfer Programs

Given that SWB indicators have been essential to analyze individuals' perceptions of quality of life, they should also be considered important tools to evaluate the impacts of social policies on poverty and wellbeing. Among these policies, we highlight the CCT programs, whose aim is to strengthen human capital providing cash assistance to families living in poverty. CCT program conditionalities usually involve commitment to education, health, and nutrition (Rawlings and Rubio 2003).

According to Azevedo and Robles (2013), CCT programs combine redistributive and structural objectives. The redistributive (immediate) objectives relate to poverty reduction through income supplementation to increase the purchasing power and facilitate the insertion of socially vulnerable families into the market. The structural (strategic) objectives aim to improve the wellbeing of beneficiaries, as well as contributing to develop human capital in children and adolescents and to reduce the intergenerational transmission of poverty. These objectives would be achieved, for example, through children's attendance at school, mothers' access to children's medical services, and also through beneficiaries' immunization level.

Despite the importance of CCT programs to socioeconomic development and wellbeing, studies that have assessed the relationship between CCT programs and SWB indicators are still scarce. Dabalen et al. (2008) used pooled data and the PSM method to estimate the effects of two Albanian programs of poverty alleviation. According to the authors, the beneficiary families showed higher levels of dissatisfaction with their life and financial situation, especially when living in urban areas. Chindarkar (2012) analyzed a CCT program in Peru and also suggested that the beneficiaries had lower levels of SWB. It happens because

the program would have caused feelings of frustration and low self-esteem, affecting the beneficiaries' perception and acceptance of social programs.

Handa et al. (2016) used an experimental design to analyze two unconditional cash transfer programs in Zambia. The authors suggested that the programs are associated with significant improvements in the perception of poverty, because of changes in the consumption patterns of beneficiary households. On the other hand, Lloyd-Sherlock et al. (2012) assessed the impacts of social protection interventions on the elderly in the cities of Rio de Janeiro and Ilhéus, Brazil. The authors highlighted an increase in life satisfaction at both the individual and family level. However, these results seem to be strongly associated with the dynamics of economic and income growth in the country, which allowed for substantial increases in subsidies over time. Along the same line, Martorano et al. (2014) evaluated the Kenyan government's cash transfer program for orphans and vulnerable children. The authors corroborated positive impacts on the beneficiaries' current perceptions of quality of life and on their future expectations of subjective wellbeing.

Through a quasi-experimental design, Novotny and Kubelkova (2015) analyzed the impacts of cash transfers for workers' social protection in India. The results suggested that the program is related to a greater overall satisfaction with life and to a lower perception of poverty, but also with lower levels of happiness. Kilburn et al. (2016) analyzed the impacts of a Malawi unconditional cash transfer program through a panel of families with limitations to enter the labor market. The results stressed that transfers may have positive effects on SWB. The families used the money to improve their living conditions, which ensured that basic needs—such as food, shelter, and clothing—had been met.

Attah et al. (2016) analyzed the effects of social programs on psychosocial wellbeing (which involves subjective aspects meditated by the social environment) in Sub-Saharan Africa (Kenya, Ghana, Zimbabwe, and Lesotho). The results highlighted that cash transfers may have positive impacts on the perception of wellbeing in dimensions related to life satisfaction, autonomy, community social participation, and family interaction and acceptance. This would benefit or enhance other positive impacts, especially concerning the cognitive development of the children in the beneficiary households.

The Más Familias en Acción

MFA is a Colombian CCT program designed in 2000 to attend the vulnerable population in rural municipalities with less than 100,000 inhabitants. In 2004, the Constitutional Court ordered its extension to cover more than 3 million victims of the forced displacement caused by the armed conflict in Colombia. In 2007, MFA was also extended to

municipalities with more than 100,000 inhabitants. Nowadays, the MFA is a permanent program that covers the whole country (Arboleda 2014).

The main objective of the MFA is to alleviate poverty and inequality and to contribute to human capital formation, imposing several conditionalities to beneficiary families (DPS and DNP 2013). In this sense, the program seeks to prevent some of the main responses of poor families when facing economic crises: school drop-out and decrease in food consumption (Angulo and Gomez 2014).

The target population are poor and vulnerable families with children under 18 years old. Poverty is defined by using a multidimensional index that estimates families' living standard (Medellín and Prada 2015). In addition, all families in situations of special vulnerability, which includes extreme poverty, forced displacement by armed conflicts, and indigenous communities, are also eligible. Beneficiaries are selected according to two main mechanisms: (i) SISBEN score[1]; and (ii) official records certifying their poverty. The first criterion is a multidimensional index to identify families in social vulnerability using a system called SISBEN (*Sistema de Indentificación para Potenciales Beneficiários de los Programas Sociales*). The second criterion takes into account especially vulnerable families, including cases of forced displacement and indigenous communities. These special cases are entered into three official records: the record of beneficiaries of the strategy to fight extreme poverty *Red Unidos*,[2] the *Registro Único de Victimas*,[3] and the *Censo Indígena* (Medellín and Sánchez 2015).

The enrollment of beneficiaries is carried out in two main stages (Medellín and Prada 2015). First, based on SISBEN score and official registers, municipalities inform potential beneficiaries to attend an enrollment event and let them know which documents are needed for the official enrollment. In the case of indigenous families, enrollments are carried out in their territories, reservations, and town councils, based on the information provided by the traditional authorities. Families voluntarily decide whether to participate in the program and to attend to the enrollment event to provide their documents. The second stage of enrollment comprises the validation of the documents and selection of the beneficiary families through an centralized system (SIFA, which means *Más Familias en Acción* Information System).

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[1] According to DPS (2015), the potential beneficiaries of MFA program should have a SISBEN score of 0–30.56 for capital cities, 0–32.20 for rural town and 0–29.03 for rural area.

[2] *Red Unidos* is a strategy of the Colombian government to provide a comprehensive response to the many dimensions of extreme poverty. In this strategy public entities provide social services. It also uses SISBEN as a selecting mechanism.

[3] *Registro Único de Victimas* is the national registry of victims of the armed conflict in Colombia.

The MFA is implemented through two main components (DPS 2015). The first provides two types of transfers, conditional on the fulfillment of health and education commitments. Health transfers are made when all family members under 7 years of age attend to medical appointments for monitoring growth and development. Each beneficiary family receives a single incentive, regardless of the number of children in this age group, which in 2014 ranged between USD 32 and 37 per bimester, depending on the locality. Education transfers, in turn, vary with the number of children and adolescents attending school and with the grades that they are attending. Each child or adolescent receives a transfer, to a maximum of three per family, not including children in daycare or the disabled. In 2014, the bimonthly transfer[4] per child ranged between USD 5 and 88, depending on the age and locality.

The second component relates to the community wellbeing through actions based on social participation and institutional interaction, aiming to improve the social capital and the quality of life of the beneficiaries. The mothers, the program rights-holder, and their families must participate in activities directed to: (i) the appropriation of the objectives and content of the program; (ii) the provision of services to connect strategies complementary to the objectives of the program; (iii) training in personal improvement, leadership, entrepreneurship, and themes related to the role of mothers in family life and child rearing; (iv) the development of processes to strengthen the beneficiaries' shared capacities; and (v) the development of processes of citizen education, community participation, and social capital construction (DPS 2015).

Summary and Contributions

This study adds some important contributions to the literature about the relations between public policies and the family quality of life. The first main contribution is to comprehend the impacts of CCT on SWB. The evaluation of public policies has largely relied on objective indicators, education, health and labor market. Nonetheless, SWB indicators comprehend more general aspects of living conditions and may provide a broader understanding of social problems. There are still rare studies exploring this topic in the literature, some of them with opposing results.

The second main contribution is to analyze the effectiveness of the MFA in Colombia. The MFA provides a particular case of study because the program imposes a series of conditionalities that may affect different components of the family wellbeing. Although our analyses are restricted to Colombian families, results can be a reference to understand

the effectiveness of CCT in other developing countries, where these social policies have been largely employed to reduce poverty and improve the family quality of life.

Materials and Methods

The ENCV and Outcome Variables

This study used microdata from the ENCV, between 2008 and 2016. The ENCV is a household survey conducted every year by the *Departamento Administrativo Nacional de Estadística* [National Administrative Department of Statistics] (DANE[5]). It collects valuable information about socioeconomic characteristics, living conditions, perception of poverty, subjective dimensions of wellbeing, and family participation in social programs. The ENCV covers the whole Colombian territory, which is divided in nine regions: Bogotá D.C., Antioquia, Valle, Atlantic Region, Eastern Region, Central Region, Pacific Region, San Andrés, and Orinoquia-Amazonia. The unit of analysis was the family and the average sample size was 20,377 families per year during the period under study.

The 14 subjective indicators used as outcome variables in our analyses are shown in Table 1. They were grouped in five main dimensions of analysis: income and poverty; human capital; social capital; work and wellbeing; placebo. The first three dimensions (income and poverty; human capital; social capital) represent the MFA program *direct impacts*, because they are related to the program's main objectives. The indicators related to work and wellbeing are expected to represent the *indirect impacts* of the program. Although, at first, the MFA did not envisage these indirect impacts, it can be indirectly affected by the accumulation of human and social capital. Finally, the indicators in the last dimension (placebo) represent the MFA *unexpected impacts*. Since no significant impact is expected for these indicators, they are used as a placebo to test the robustness of the results.

Control Variables and Sample Design

The Colombian households were classified into six socioeconomic strata according to the topology defined by the Act 142 of 1994 and by the DANE (2011) (Table 2): (1) low–low; (2) low; (3) medium–low; (4) medium; (5) medium–high; and (6) high. This stratification is based on the structural characteristics of the dwellings and on the urban or rural surroundings. It has been used to

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[4] Education incentives are received only five times a year.

Table 1 Dimensions and outcome variables

Impact	Dimensions	Variable	Definition	Information
Direct	Poverty and income	Subjective poverty	1 If the family considers themselves poor, 0 otherwise	2008, 2010–2016
		IEQ[a]	1 If the family considers that their income does not cover basic expenses, 0 otherwise	2008, 2010–2016
		Income	1 If the family is dissatisfied with their income, 0 otherwise	2010, 2011, 2014–2016
	Human capital	Health	1 If the family is dissatisfied with their health, 0 otherwise	2010, 2011, 2014–2016
		Education	1 If the family is dissatisfied with their education, 0 otherwise	2010, 2011, 2014–2016
		Food	1 If the family is dissatisfied with their food, 0 otherwise	2010, 2011, 2014–2016
	Social capital	Friends	1 If the family is dissatisfied with theirs friends, 0 otherwise	2010, 2011, 2014–2016
		Family	1 If the family is dissatisfied with their family environment, 0 otherwise	2010, 2011, 2014–2016
		Community	1 If the family is dissatisfied with their community, 0 otherwise	2010, 2011, 2014–2016
Indirect	Work and well-being	Work	1 If the family is dissatisfied with their work, 0 otherwise	2010, 2011, 2014–2016
		Housing	1 If the family is dissatisfied with their housing, 0 otherwise	2010, 2011, 2014–2016
		Living conditions in general	1 If the family is dissatisfied with their living conditions in general, 0 otherwise	2010, 2011, 2014–2016
Unexpected	Placebo	Autonomy	1 If the family is dissatisfied with their autonomy, 0 otherwise	2008–2011, 2014–2016
		Security	1 If the family is dissatisfied with their security, 0 otherwise	2008–2011, 2014–2016

Source Prepared by the authors

[a]Version of the *Income Evaluation Question*—IEQ introduced by Van Pragg (1968, 1971), adapted to the Colombian case by DANE (1997)

Table 2 Sample size, population size, and percentage of the total for each group of MFA and non-MFA families per socioeconomic stratum

Strata	2008					2016				
	n	N	% N	NMFA	% NMFA	n	N	% N	NMFA	% NMFA
1	4834	3,282,089	28.6	993,875	67.7	9382	4,390,207	30.8	1,270,198	63.6
2	5305	4,673,971	40.8	347,158	23.6	8386	5,671,739	39.8	617,931	31.0
3	1942	2,390,091	20.9	41,355	2.8	3225	2,854,413	20.0	99,884	5.0
4	374	593,731	5.2	6766	0.5	595	735,162	5.2	7872	0.4
5	106	163,670	1.4	1667	0.1	166	197,908	1.4	0	0.0
6	85	147,770	1.3	0	0.0	90	136,374	1.0	115	0.0
Ignored	261	209,595	1.8	77,644	5.3	586	277,318	1.9	0	0.0
Total	12,907	11,460,917	100	1,468,465	100.00	22,430	14,263,121	100.00	1,996,000	100.00

Source Prepared by the authors based on ENCV 2008 and ENCV 2016

differentiate tariffs for public utilities and to allocate social subsidies for vulnerable families—people in Strata 1, 2 and 3 are the main targets for social policies. The stratification is also a proxy for the multidimensional indicator of poverty and extreme poverty used by the SISBEN.

Strata 1 and 2 contain the largest socioeconomic group in Colombia (70.5% of the population in 2016). Stratum 1 (31% of the population in 2016), the most vulnerable group, represents the largest share of families benefitting from the MFA (68% in 2008 and 64% in 2016). To ensure a more

Table 3 Average values of explanatory variables (thousand pesos for income and % for others)—Stratum 1

Variable	Description	2008		2016	
		MFA	No MFA	MFA	No MFA
Per capita income	Average per capita income[a]	154.3	299.2	258.6	452.4
Own and paid	1 If the family owns a fully paid house, 0 otherwise	54.6	50.4	49.2	50.7
Urban	1 If the family lives in the urban area, 0 otherwise	54.3	62.3	50.1	62.9
Male	1 If head of household is a man, 0 otherwise	74.4	71.9	66.0	67.5
Age	Age of the head of household	44.3	46.6	42.7	48.5
Education	Years of education of head of household	4.4	5.0	5.9	6.4
Unemployed	1 If the head of household is unemployed, 0 otherwise	4.3	4.2	4.7	4.4
Married	1 If the head of household is married or has affective commitment	81.0	67.1	76.7	61.7
Dependency ratio	Number of children (< 15) + number of elderly (> 64)/number of people aged 15–64	109.3	70.9	95.6	59.9
Water	1 If the family has access to the water supply network, 0 otherwise	66.9	78.5	76.1	82.6
Sewage	1 If the family has access to the sewage system, 0 otherwise	39.5	53.1	42.7	57.7
Waste collection	1 If the family has access to the waste collection service, 0 otherwise	48.1	60.2	56.8	69.3
Atlántica	1 if the family lives in the Atlántica region, 0 otherwise	40.8	33.1	36.8	34.3
Oriental	1 If the family lives in the Oriental region, 0 otherwise	14.6	15.4	10.7	16.7
Central	1 If the family lives in the Central region, 0 otherwise	8.6	9.6	11.8	11.1
Pacífica	1 If the family lives in the Pacífica region, 0 otherwise	18.4	14.7	23.5	13.8
Antioquia	1 If the family lives in the Antioquia region, 0 otherwise	9.7	10.0	8.9	8.5
Valle	1 If the family lives in the Valle region, 0 otherwise	3.2	10.2	5.4	9.0
San Andrés	1 If the family lives in the San Andrés region, 0 otherwise	0.1	0.1	0.0	0.1
Orinoquía	1 If the family lives in the Orinoquía region, 0 otherwise	2.4	1.4	1.8	1.7
Colombia mayor	1 If the family has Colombia Mayor subsidy, 0 otherwise	5.5	6.3	9.0	12.0
Housing subsidy	1 If the family has housing subsidy, 0 otherwise	3.1	1.5	1.8	0.8
Other subsidies	1 If the family has other subsidies, 0 otherwise	7.8	5.3	2.6	1.4

[a]The average per capita income was deflated by the Consumer Price Index (CPI)

Source Prepared by the authors based on ENCV 2008 and ENCV 2016

accurate comparison of treatment (MFA families) and control (non-MFA families) groups, the analyses of this study will be restricted to Stratum 1.

Table 3 shows the average characteristics of MFA and non-MFA families in Stratum 1 for 2008 and 2016. The characteristics considered in this study were: income; household infrastructure; region; sex; age; education; occupational status; marital status; dependency ratio; and participation in social programs (MFA and others). Most of these variables have been used in previous SWB studies; others have been incorporated to account for the specificities of the Colombian society (Guillen-Royo 2008; Hallerod 2006; Piñeros and Clavijo 2013; Wagle 2007; Wang et al. 2011).

The per capita income of MFA families increased by 68% between 2008 and 2016, a better result when compared with non-MFA families (51%). However, this dynamic cannot be explained solely by the MFA' cash transfers, because economic growth and decreasing inequality have benefited mainly the poorest and most vulnerable social groups in the period.[6] Nonetheless, differences between MFA and non-MFA families remain high: In 2016, per capita income in the latter group was 1.75 times higher than in the former.

In 2016, no marked differences were observed between the dwelling status of beneficiary and non-beneficiary families (owned and paid houses). Families were predominantly male-headed, with no marked differences between MFA and non-MFA (66 and 68% in 2016, respectively). In turn, MFA families were more likely to live in rural areas and be headed by younger people. In 2016, only 50% of the MFA families lived in urban areas, against 63% of the non-MFA families. In the same year, the average age of beneficiary family heads was 43, and 48 years old for non-beneficiary family heads. The percentage of married couples (or those with some kind

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[6] According to DANE data, the Colombian economy grew by an average of 4.1% p.a. in the period, and inequality (Gini coefficient) increased from 0.59 in 2008 to 0.52 in 2016.

of affective bond or commitment) was 77% among MFA families, against 62% in non-MFA families.

Unemployment rate was low and had similar values in MFA and non-MFA families (4.7% and 4.4% in 2016, respectively). However, MFA families had a remarkably higher dependency ratio than non-MFA families and tended to be headed by persons with lower levels of education. Household heads had few years of education in both groups, but slightly lower in MFA families (5.9 vs. 6.4 years). Although the dependency ratio declined between 2008 and 2016, it remains high, especially among MFA families: about 96 dependents for each 100 people of economically productive age in 2016 (only 60 among non-MFA families).

Access to public services was also lower among MFA families. In 2016, only 43% of MFA families had access to the sewage system (58% among non-MFA families), and 56% had access to waste collection (69% among non-MFA families). MFA families were mostly from the Atlantic and Pacific regions. In 2016, 72.1% of the MFA families lived in these regions (59.2% of the non-MFA families), which historically have the highest poverty rates in Colombia (DANE 2016).

Colombia Mayor is another important social program in Colombia, and the share of participant families increased in the period. This is an unconditional cash transfer that seeks to strengthen social protection for the non-retired elderly living in poverty or extreme poverty. The prevalence of poverty among the Colombian families headed by the elderly was high and this group's participation in the program has increased due to ageing.[7] In turn, the share of MFA and non-MFA families participating in other social programs was small and decreased slightly between 2008 and 2016.

Empirical Strategy

The equation to measure the impacts of the MFA on indicators of SWB can initially be represented by:

$$y_i = \alpha + \gamma T_i + \mathbf{x}_i' \boldsymbol{\beta} + u_i \tag{1}$$

where y_i represents the subjective indicator for family i ($y_i = 1$ or 0, variables in Table 1). T_i indicates whether the person participates ($T_i = 1$) or not ($T_i = 0$) in the MFA program; $\mathbf{x}_i'$ is the column vector of control variables; α is the intercept and $\boldsymbol{\beta}$, the vector of coefficients; γ represents the program's expected impact on y_i and u_i is the random error.

Four different strategies were used to estimate the net effect of the MFA on poverty perception and subjective wellbeing (γ). Two of these strategies were based on non-experimental designs: (1) a linear probability model (LPM),

using a pooled data sample; (2) *Probit* models, with independent cross-sectional samples. The other two are based on quasi-experimental designs: (3) PSM, with independent cross-sectional samples for each year; and (4) IPWRA for each cross-sectional sample. The objective was to analyze the robustness of the estimates under different hypotheses on the type of relationship between the variables of interest and on the distribution of the model errors.

Linear Probability Model with Pooled Data

In the first strategy, we pooled the cross-sectional household surveys of 2008 and 2010–2016. The main advantage of pooled data is the efficiency of the estimators, since the sample size and, consequently, the degrees of freedom increase considerably. This method also allows for identifying structural changes in time through the interaction between the treatment variable T and the binary variables that identify the year of the survey ($T \times$ year). The main disadvantage of the method is the assumption of homogenous distribution of errors over time (Wooldridge 2003). To correct for occasional heterogeneity in the error distribution, we used robust estimates for standard errors.

The LPM for pooled data was estimated by ordinary least squares (OLS) and is a simple and usually convenient approximation of the underlying response probability, especially when the researcher is only interested in analyzing the average net impacts of the explanatory variables for the middle ranges of the data (Wooldridge 2003). However, the errors in the LPM are not normally distributed. They are heteroskedastic with variance depending on the parameters in vector $\boldsymbol{\beta}$ (Greene 2003). Because of these limitations, the OLS estimates for the LPM model must be analyzed carefully, even when they provide useful information for a comparison with nonlinear probability models.

Probit Model with Cross-Sectional Data

In the second strategy, we estimated the coefficients of Eq. (1) using nonlinear *Probit* models for each cross-sectional sample from the ENCV. Cross-sectional estimates assume that both the error distribution and all the coefficients vary in time. Additionally, the nonlinear *Probit* models show greater theoretical adherence to the binary choice variables (Long 1997). Although errors in the *Probit* model are also heteroskedastic, the maximum likelihood estimators are asymptotically efficient (Wooldridge 2003).

The dependent variable in the *Probit* model corresponds to an underlying latent variable related to self-perception of poverty and subjective wellbeing. Thus, the *Probit* coefficients refer to the marginal impacts on the latent variable, and not to variations in the observed probability y_i (Greene and Hensher 2008). Given that the marginal effect on

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[7] According to Fedesarrollo and FSC (2015), the poverty rate for Colombia's population over 65 stands at 44%.

probability y_i differs for each point in the regression model, it was estimated by calculating the average marginal effects for each regressor value (Wooldridge 2003).

Propensity Score Matching with Cross-Sectional Data

One important assumption in previous analyses is that participation in the MFA program (variable T_i in Eq. 1) is independent of unobservable factors affecting the SWB indicators (errors in Eq. 1). Since the groups of MFA beneficiaries and non-beneficiaries are not random selections of the population, there may be unobservable factors influencing both people's participation and perceptions of wellbeing (proactive attitudes, for example). In this case, the estimates previously obtained tend to be biased and inconsistent due to selection bias.

This third strategy of analysis corrects for lack of randomness in treatment and control groups, using the PSM method. The conditional expectation y_i for the treated ($T_i = 1$) and control ($T_i = 0$) groups in Eq. (1) can be represented by (Angrist and Pischke 2009):

$$E[y_i|T_i = 1] = \alpha + \gamma + E[u_i|T_i = 1] \quad (2)$$

where γ is the effect of the treatment T_i. In turn, the selection bias will be given by[8]:

$$E[u_i|T_i = 1] - E[u_i|T_i = 0] = E[y_{0i}|T_i = 1] - E[y_{0i}|T_i = 0] \quad (3)$$

where $E[y_{0i}|T_i = 1]$ is the counterfactual and represents the expected perception of wellbeing for non-beneficiary families (control group) if they were benefited by the MFA. $E[y_{0i}|T_i = 0]$ is the expected perception of wellbeing for non-beneficiaries of the MFA. If the MFA beneficiaries were chosen randomly, the simple regression of y_i over T_i would accurately measure the causal effect γ.

The parameter γ would ideally be estimated by comparing the responses of the same family i before and after the treatment (y_{0i} and y_{1i}). In this case, the effect of the treatment on family i would be the difference $y_{1i} - y_{0i}$, and the *Average Treatment Effect* (ATE) would be $E(y_{1i} - y_{0i})$. The problem is that it is impossible to observe y_0 and y_1 for the same family in the same period of time. If selection for the program was random in **x**, then the ATE would be basically given by the difference between the average values of y_i for the treatment and control groups:

$$ATE = E(y_{1i} - y_{0i}) = E(y_i|T = 1) - E(y_i|T = 0) \quad (4)$$

However, given that selection for the MFA is based on predefined criteria, we cannot assume that beneficiary and non-beneficiary families are random selections of the

population. In this case, estimates based on Eq. (4) would be biased and inconsistent. The non-randomness of the treatment and control groups requires the use of quasi-experimental methods to ensure that families in the treated and control groups show similar characteristics.

We applied the PSM proposed by Rosenbaum and Rubin (1983) to match beneficiary and non-beneficiary families based on similar observable characteristics **x**. For each family in the treated group (MFA families), the method finds one or more families in the non-treated control group (non-MFA families) with similar characteristics. Once the matched families are comparable, the expected value of y for each group will be given by:

$$E(y_0|\mathbf{x}, T = 0) = E(y_0|\mathbf{x}) \text{ and } E(y_0|\mathbf{x}, T = 1) = E(y_1|\mathbf{x}) \quad (5)$$

The PSM eliminates the selection bias by matching the groups of beneficiaries and non-beneficiaries based on the observable characteristics **x**. The matching is based on a probability model for participation in the program ($T_i = 1$ or $T_i = 0$). This probability, named propensity score, can be estimated by a *Probit* model and is represented by $p(\mathbf{x}_i)$. The assumption under the PSM estimates is the conditional independence $\mathbf{x}_i \perp T_i | p(\mathbf{x}_i)$ (Rosenbaum and Rubin 1983). According to this assumption, the distribution of covariates should be similar in the treated and control groups, since families have been paired through the propensity score.

The effect of the treatment will then be estimated by the *average effect of treatment on the treated* (ATT). The ATT is the difference between the average results of the treatment and control groups once individuals are matched based on observable characteristics. In other words, the PSM matches the groups of beneficiary and non-beneficiary families with similar scores and compares the expected values of y in these paired groups:

$$ATT = E[Y_{1i} - Y_{0i}|T_i = 1, p(\mathbf{x}_i)] = E[Y_{1i}|T_i = 1, p(\mathbf{x}_i)] - E[Y_{0i}|T_i = 0, p(\mathbf{x}_i)] \quad (6)$$

Inverse Probability Weighted Regression Adjustment with Cross-Sectional Data

One of the PSM main limitations is that the method does not take into account differences in the sample weights. The sample weight (w) in the ENCV considers the stratified sample design of the survey, which implies that families can present unequal probabilities of selection. Since the PSM treats all sample units equally, the ATT estimates may not accurately represent the real impact of the program on the whole population (Dugoff et al. 2014). In this context, the IPWRA method has two main advantages over the PSM: (i) the estimates include the sample weights; (ii) it deals with problems associated with poor functional specification of the propensity score (Wooldridge 2010).

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[8] Additional information can be available upon request.

Table 4 Families matched by PSM—Stratum 1

Year	Families matched		Total
	Treatment group	Control group	
2008	1.334	3.352	4.686
2010	2.010	3.384	5.394
2011	3.551	7.039	10.590
2012	2.286	5.598	7.884
2013	2.828	5.179	8.007
2014	2.456	4.977	7.433
2015	2.664	6.107	8.771
2016	2.429	6.684	9.113

Source Prepared by the authors based on ENCV

The IPWRA combines two methods to estimate the ATT (Imbens and Wooldridge 2009): Inverse Probability Weighted (IPW) and Regression Adjustment (RA). The IPW compares the weighted averages of the control and treatment groups, where the weighting factor is a function of the sample weights and the inverse of the probability estimated by the propensity score. Specifically, the weighting factor is the inverse of the estimated probability of participation in the social program multiplied by the sample weight of each observation $\left(\frac{1}{p(x_i)} w_i \text{ for } T_i = 1, \text{ and } \frac{1}{1-p(x_i)} w_i \text{ for } T_i = 0 \right)$. This approach gives more weight for those non-MFA families whose characteristics are more similar to the treated observations (MFA families).

In turn, the RA estimates the net impact assuming the existence of conditional independence, i.e., adjusting independent regressions for the dependent variable for both the treatment and control groups. The ATT will then be computed by averaging the differences between the expected values of y_i for the treated families (MFA), once we control for **x** (Abadie and Imbens 2011). By obtaining separate estimators for the treatment and dependent variable, the IPWRA treats the treatment group as an endogenous variable. Hirano et al. (2003) defined the IPWRA estimator as robust and efficient, because it exhibits smaller biases for the ATT in comparison with other estimators. Moreover, the IPWRA estimator produces consistent ATT estimates, even when one of the two models (treatment or outcome) is incorrectly specified (Cattaneo 2010).

Results

Matching Treated and Control Groups

First, we matched homogeneous pairs of MFA and non-MFA families by year applying the PSM. The matching was done by the nonparametric kernel algorithm, which provides more

efficient estimates by comparing each treated family with a weighted average of all non-treated families (Bernal and Peña 2011). Standard errors were estimated using the bootstrap technique with 50 replications. The common support was defined by eliminating 10% of the families with the lowest probabilities of participation in the program. Table 4 summarizes the number of families matched in both the control and treatment groups in each year.

After the matching, the differences between the observable characteristics of the treatment and control groups are expected to be not significant, that is, the percentage of bias reduction, which is the difference between the observable characteristics of the treatment and control groups before and after the matching, is expected to be high (Caliendo and Kopeinig 2008; Rosenbaum and Rubin 1983). Most variables indicated bias reductions greater than 50%, suggesting a well-balanced matching (Araújo 2010). Only the variable dependency ratio in 2013 remained with significant differences between the averages of the treatment and control groups after matching. The goodness-of-fit diagnostics for the PSM and IPWRA is shown in Appendices 1 and 2 respectively.

The Impacts of the MFA Program

Table 5 shows the estimates of MFA impacts on the subjective indicators of poverty and income. The results provide substantial evidence that the MFA program increased the perception of poverty and income insufficiency. The ATTs estimated by PSM were positive and significant, except for subjective poverty in 2015 and income evaluation question (IEQ) in 2014.[9] Similar results were observed for the other methods (LPM, *Probit* and IPWRA). *Probit* and IPWRA estimates were similar to PSM estimates in all years. For example, the estimates suggested that MFA increased the probability of reporting subjective poverty between 2.4 and 5.8 percentage points. In turn, the LPM produced a larger number of nonsignificant estimates: subjective poverty in 2014, IEQ in 2014 and 2015, and dissatisfaction with income in 2011. However, LPM estimates should be analyzed with care, since they assume a linear relationship between the probability of wellbeing perception and the regressors in the absence of selection bias.

The effects of the MFA program on the dimension of human capital, which also refers to the direct impacts of the program, are shown in Table 6. The estimates for dissatisfaction with health and education were negative in some years and not significant in others, suggesting moderate evidence that MFA improved the perceptions of good health and

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[9] IEQ is a measure developed by Van Praag (1968) to assess the utility of income for families.

Table 5 Estimates of MFA impacts on the dimensions of poverty and income. Colombia—Stratum 1

Variable	Year	Pooled OLS		CS—probit (marginal effect)		Propensity score matching ATT (kernel)		IPWRA ATT	
		Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Subjective poverty	2008	0.052**	0.018	0.048*	0.021	0.030*	0.014	0.038[+]	0.021
	2010	0.037**	0.014	0.032[+]	0.018	0.040*	0.016	0.031[+]	0.018
	2011	0.040**	0.014	0.055**	0.017	0.024*	0.010	0.050**	0.018
	2012	0.067***	0.013	0.041**	0.016	0.038**	0.012	0.036*	0.016
	2013	0.037**	0.012	0.037*	0.016	0.038**	0.013	0.044**	0.016
	2014	0.016	0.013	0.043**	0.016	0.056***	0.010	0.043**	0.016
	2015	0.029*	0.013	0.006	0.016	0.015	0.014	0.006	0.017
	2016	0.058***	0.014	0.054**	0.017	0.058***	0.014	0.047**	0.017
Income evaluation question IEQ	2008	0.121***	0.018	0.099***	0.021	0.083***	0.017	0.101***	0.022
	2010	0.087***	0.014	0.053**	0.018	0.055***	0.013	0.049*	0.019
	2011	0.093***	0.014	0.083***	0.018	0.068***	0.011	0.075***	0.019
	2012	0.041**	0.013	0.062***	0.016	0.072***	0.011	0.062***	0.016
	2013	0.021[+]	0.012	0.064***	0.015	0.063***	0.011	0.067***	0.016
	2014	− 0.017	0.012	0.020	0.015	0.016	0.014	0.018	0.016
	2015	0.003	0.013	0.050**	0.015	0.030*	0.013	0.050**	0.016
	2016	0.145***	0.014	0.067***	0.016	0.075***	0.014	0.064***	0.017
Dissatisfaction with income	2010	0.105***	0.015	0.047**	0.018	0.043**	0.013	0.050**	0.018
	2011	0.021	0.015	0.092***	0.018	0.079***	0.014	0.090***	0.019
	2014	0.078***	0.013	0.040*	0.017	0.043**	0.014	0.041*	0.017
	2015	0.045**	0.014	0.035*	0.017	0.028[+]	0.015	0.042*	0.017
	2016	0.079***	0.015	0.088***	0.017	0.082***	0.013	0.083***	0.017

Source Prepared by the authors based on ENCV

[+] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

education. The MFA impacts on dissatisfaction with health were negative and significant in 2014 and 2015, according to the *Probit*, PSM, and IPWRA methods. The estimates indicate reductions between 2.4 and 4.2 percentage points in the probability of dissatisfaction. The estimates for 2010 were also negative and significant in the LPM and PSM. In turn, all methods indicated negative and significant impacts of the MFA on dissatisfaction with education in 2010, 2011, and 2014 (reductions range between 2.4 and 6.5 percentage points). The impacts were also negative and significant in 2014 (PSM) and 2016 (LPM).

On the other hand, the MFA program tends to be associated with greater dissatisfaction with food. Positive and significant estimates were obtained in 2010 (all methods), 2011 (*Probit*, PSM and IPWRA) and 2016 (all methods). These positive impacts varied between 2.2 and 7.3 percentage points.

Table 7 shows the MFA impacts on the dimension of social capital, which is one of the direct objectives of the program's community welfare component. In particular, the MFA program seems to be associated with moderate reductions in dissatisfaction with family. The negative and significant estimates obtained in 2010 (LPM), 2011 (all methods),

2014 (PSM and IPWRA), and 2015 (PSM) varied between 1.1 and 3.4 percentage points. In contrast, the results were inconclusive regarding MFA effects on dissatisfaction with friends and the community. Most estimates were not significant, and the others ranged between negative and positive impacts.

The impacts of MFA program on the dimensions of work, housing, and living conditions in general are shown in Table 8. These dimensions are related to the indirect impacts of the MFA, since changes in these indicators would indirectly reflect changes in the dimensions of income, human, and social capital. The results stress that the MFA program tends to increase the probabilities of dissatisfaction with work and housing. All methods indicated that MFA had positive and significant impacts on dissatisfaction with work in 2010, 2014, and 2016 (increase ranges between 3.7 and 7.3 percentage points). The impacts on dissatisfaction with housing were more robust, with positive and significant estimates in most years (increase ranges between 1.2 and 7.1 percentage points).

In turn, the estimates for the impacts of the MFA on dissatisfaction with living conditions in general are not

Table 6 Estimates of MFA impacts on the dimension of human capital. Colombia—Stratum 1

Variable	Year	Pooled OLS		CS—probit (marginal effect)		Propensity score matching ATT (Kernel)		IPWRA ATT	
		Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Dissatisfaction with health	2010	− 0.027*	0.011	− 0.013	0.014	− 0.022*	− 0.012	− 0.015	0.013
	2011	0.003	0.012	0.008	0.015	0.000	0.008	0.006	0.015
	2014	− 0.012	0.010	− 0.042**	0.014	− 0.038**	0.011	− 0.039**	0.013
	2015	− 0.016	0.010	− 0.029**	0.013	− 0.024*	0.011	− 0.024*	0.012
	2016	− 0.010	0.011	0.014	0.012	0.002	0.008	0.014	0.012
Dissatisfaction with education	2010	− 0.065***	0.013	− 0.032*	0.015	− 0.030*	0.014	− 0.031*	0.015
	2011	− 0.035**	0.013	− 0.059***	0.016	− 0.049***	0.009	− 0.055**	0.016
	2014	0.000	0.011	− 0.018	0.015	− 0.027*	0.011	− 0.019	0.014
	2015	− 0.024*	0.011	− 0.032*	0.014	− 0.049***	0.012	− 0.032*	0.014
	2016	− 0.021+	0.012	− 0.007	0.014	− 0.010	0.010	− 0.010	0.014
Dissatisfaction with food	2010	0.073***	0.013	0.049***	0.014	0.065***	0.014	0.047**	0.015
	2011	0.009	0.012	0.032*	0.013	0.022*	0.010	0.030*	0.014
	2014	0.011	0.010	0.006	0.012	0.014	0.009	0.005	0.012
	2015	0.015	0.010	0.019	0.012	0.005	0.010	0.015	0.012
	2016	0.035**	0.011	0.042***	0.012	0.044***	0.009	0.039**	0.013

Source Prepared by the authors based on ENCV

[+]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

straightforward. Most estimates were not significant, with positive and negative signals, depending on the year and method of analysis. In other words, the impacts of the MFA on the perception of life in general were not conclusive, which might be reflecting the divergent impacts observed in specific dimensions of wellbeing.

Finally, Table 9 allows us to test the robustness of the results (placebo test), with MFA impacts on dissatisfaction with autonomy and security. Since these dimensions are not directly or indirectly related to the MFA program, no relevant impacts are expected. All methods produced not significant estimates, in most years. The exception is the positive and significant impact on dissatisfaction with security in 2010 (all methods) and 2011 (PSM). Nonetheless, this positive effect may be associated with the victims of the armed conflict in Colombia, who are also MFA beneficiaries, given that peace negotiations between the government and the guerrillas started only in 2012.

Discussion

Cash transfer programs became the main policy in the fight against poverty and inequality in Latin-America. This study analyzes the impact of the Colombian MFA program on 14 indicators of SWB, providing important elements to understand how people feel about the improvements the program has brought to their lives. The MFA is the main social policy to reduce poverty and improve the formation of human capital in Colombia, attending more than 2.5 million families. But the program has had divergent impacts on the dimensions of SWB. The negative side of the MFA is that the program increased the perception of poverty and dissatisfaction with income of the MFA families in comparison with non-MFA families. The positive side is that the program reduced mainly the dissatisfaction with health and education, which is probably a result of the main conditionalities imposed to the beneficiary families.

The higher perception of poverty among beneficiary families may be associated with the concept of welfare stigma. This concept considers the implications of the absence of self-esteem and the presence of negative feelings among the beneficiaries of social benefits (Chindarkar 2012; Wong and Lou 2010). According to Moffitt (1983), the main source of welfare stigma lies in the fact of receiving a social benefit, rather than in the amount of the benefit. It means that the welfare stigma might be related to the psychological impact of being a beneficiary of social subsidies. In this sense, the results suggest that beneficiary families, despite having similar socioeconomic conditions, see themselves as poorer than their non-beneficiary peers, because they depend on cash subsidies.

The results for the IEQ indicator, a measure of the utility of income, also suggest that cash transfers would become a source of insufficiency of income. Beneficiary families would be more likely to consider their income as insufficient to cover basic expenses and, consequently, experience

Table 7 Estimates of MFA impacts on the dimension of social capital. Colombia—Stratum 1

Variable	Year	Pooled OLS		CS—probit (marginal effect)		Propensity score matching ATT (Kernel)		IPWRA ATT	
		Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Dissatisfaction with family	2010	− 0.014*	0.007	0.001	0.007	− 0.004	0.005	− 0.002	0.007
	2011	− 0.016*	0.007	− 0.034**	0.011	− 0.013**	0.004	− 0.031**	0.010
	2014	− 0.005	0.005	− 0.012	0.008	− 0.018**	0.005	− 0.013[+]	0.007
	2015	0.002	0.006	0.001	0.008	− 0.011*	0.005	− 0.001	0.007
	2016	0.000	0.006	0.008	0.007	0.003	0.004	0.005	0.006
Dissatisfaction with friends	2010	0.015	0.009	0.031**	0.010	0.030***	0.007	0.033**	0.011
	2011	0.009	0.011	0.005	0.012	0.000	0.006	0.009	0.013
	2014	0.002	0.007	− 0.012	0.010	− 0.013[+]	0.007	− 0.013	0.009
	2015	− 0.008	0.007	− 0.019*	0.009	− 0.007	0.007	− 0.018*	0.009
	2016	− 0.004	0.008	0.002	0.009	0.012[+]	0.007	0.004	0.009
Dissatisfaction with community	2010	0.017*	0.007	0.008	0.013	0.013	0.009	0.008	0.014
	2011	− 0.008	0.005	0.023	0.014	− 0.002	0.007	0.030[+]	0.016
	2014	0.002	0.006	0.004	0.012	0.000	0.008	0.000	0.011
	2015	0.008	0.006	− 0.008	0.011	− 0.005	0.009	− 0.008	0.011
	2016	− 0.002	0.006	0.005	0.011	0.008	0.007	0.007	0.010

Source Prepared by the authors based on ENCV

[+] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

greater dissatisfaction with their income sufficiency. Similarly, the results also stress the beneficiary families' greater dissatisfaction with their food consumption, which can be related both to the impossibility of the cash transfer to ensure relevant structural changes in food standards and to the stigma of welfare. In other words, cash transfer would be a source of income instability and food insecurity.

On the other hand, the MFA program shows positive impacts on two important dimensions of human capital: health and education. The CCT program imposes the fulfillment of basic actions in health and education, especially school attendance and medical appointments for children and adolescents. CNC (2011) also argues that beneficiary families use subsidies mainly to buy food, school supplies, and medicines. The MFA program also offers training activities for beneficiary families living in the same community, which would provide access to complementary health services (nutrition, physical activity, health care and prevention) and education (citizenship education, handiwork, and entrepreneurship) (DPS 2017).

The MFA program exerts only moderate impacts on the dimensions of social capital. It seems to reduce dissatisfaction with family slightly, and this may be associated with the participation of families in pedagogical meetings. These activities are part of the community wellbeing component and try to provide beneficiary families with information and knowledge

to improve their living conditions. In these spaces of sociability, family members receive training to improve family life and strengthen the role of mothers in child rearing (DPS 2017). On the other hand, the MFA program seems to have no conclusive impacts on dissatisfaction with friends and the community. According to the DPS (2017), the community component of the MFA program incorporates actions based on social participation to strengthen the community's shared capacities and social capital construction. However, the program may not be generating social capital beyond the family level, which prevents beneficiary families from enjoying greater participation and integration in their communities.

Participation in the MFA program is positively related to dissatisfaction with work and housing. In general, the heads of the beneficiary families have informal, unstable, poorly remunerated, and unskilled jobs. In this context, cash transfers might be acting as unemployment benefits, temporarily relieving the lack of income derived from poor insertion in the labor market. Under these conditions, the individuals would not have the chance to improve and develop their productive skills, thus increasing their needs. Similarly, cash transfers may not be enough to reduce dissatisfaction with housing, since the value of the benefits does not allow expenses beyond the basic.

Finally, the program does not seem to provide conclusive results on dissatisfaction with life in general. This may

Table 8 Estimates of MFA impacts on the dimensions of work and well-being. Colombia—Stratum 1

Variable	Year	Pooled OLS		CS—probit (marginal effect)		Propensity score matching ATT (kernel)		IPWRA ATT	
		Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Dissatisfaction with work	2010	0.062***	0.016	0.037*	0.019	0.044**	0.014	0.044*	0.019
	2011	− 0.011	0.018	0.014	0.021	0.035**	0.011	0.013	0.023
	2014	0.073***	0.013	0.055**	0.016	0.047***	0.011	0.057**	0.017
	2015	0.021	0.013	0.003	0.016	0.002	0.013	0.000	0.016
	2016	0.037**	0.014	0.062***	0.015	0.054***	0.013	0.065***	0.016
Dissatisfaction with housing	2010	0.047**	0.014	0.035*	0.016	0.048**	0.016	0.031[+]	0.017
	2011	0.024[+]	0.014	0.043**	0.016	0.042***	0.010	0.038*	0.016
	2014	0.041**	0.012	0.033*	0.015	0.035***	0.009	0.029[+]	0.015
	2015	0.046***	0.012	0.018	0.014	0.029**	0.011	0.020	0.015
	2016	0.051***	0.013	0.067***	0.014	0.061***	0.010	0.071***	0.015
Dissatisfaction with living conditions in general	2008	0.100***	0.019	− 0.035	0.022	− 0.018	0.019	− 0.041[+]	0.023
	2010	− 0.085***	0.012	0.027*	0.014	0.035*	0.014	0.029**	0.014
	2011	− 0.096***	0.011	0.003	0.014	0.002	0.008	0.000	0.014
	2014	− 0.008	0.010	− 0.002	0.013	− 0.004	0.008	− 0.008	0.012
	2015	0.004	0.009	− 0.007	0.012	− 0.010	0.012	− 0.005	0.011
	2016	0.039***	0.010	0.005	0.011	0.017*	0.008	0.001	0.011

Source Prepared by the authors based on ENCV

[+]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Table 9 Estimates of MFA impacts on the placebo. Colombia—Stratum 1

Variable	Year	Pooled OLS		CS—probit (marginal effect)		Propensity score matching ATT (Kernel)		IPWRA ATT	
		Coef.	s.e.	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Dissatisfaction with autonomy	2010	− 0.010	0.008	− 0.012	0.009	− 0.011	0.007	− 0.012	0.009
	2011	0.016[+]	0.009	0.012	0.010	− 0.001	0.005	0.011	0.011
	2014	− 0.002	0.006	− 0.001	0.008	− 0.008	0.005	− 0.004	0.008
	2015	0.006	0.007	0.002	0.008	− 0.009	0.007	0.000	0.008
	2016	− 0.001	0.007	0.008	0.007	0.005	0.006	0.006	0.007
Dissatisfaction with security	2010	0.064***	0.014	0.048**	0.016	0.055***	0.014	0.050**	0.017
	2011	0.009	0.014	0.023	0.016	0.024*	0.009	0.025	0.017
	2014	0.016	0.011	0.007	0.014	0.009	0.011	0.007	0.014
	2015	0.018	0.012	0.003	0.014	0.008	0.012	− 0.002	0.014
	2016	0.001	0.013	0.015	0.014	0.014	0.011	0.015	0.014

Source Prepared by the authors based on ENCV

[+]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

result from the sum of the adverse impacts of the program on the dimensions of subjective wellbeing: poverty, income, food, friendship, community, work, and housing. Although MFA presents positive results on some important dimensions, such as health and education, it tends to increase the perceptions of income and food insecurity. Consequently, it

may not be a structural change to reduce the dissatisfaction of beneficiary households with their lives in general.

The placebo tests, performed with indicators of autonomy and security, indicate the robustness of the analysis. Few estimates are significant or inconsistent. The exceptions are the positive impacts on dissatisfaction with security in 2010 and 2011, which may be associated with the benefits provided to the victims of the armed conflict in Colombia (Arboleda 2014). Peace negotiations between the government of President Juan Manuel Santos and the guerrillas of the *Fuerzas Armadas Revolucionarias de Colombia* (FARC) started only in 2012. Since then, none of the methods has shown statistically significant effects of the MFA program on perception of security.

Conclusions and Limitations

Although the results of this study are based on the Colombian MFA program, they confirm many hypotheses formulated in studies on the different impacts of CCT on subjective well-being indicators. CCT programs tend to be related to higher perceptions of poverty and income insufficiency, but, on the other hand, they reduce dissatisfaction with health, education and family life, aspects that are associated with their conditionalities. Moreover, the programs may also be associated with higher perceptions of food insecurity and dissatisfaction with employment and housing. In general, a CCT program does not seem to have significant effects on social and community networks or on the perceptions of living conditions of the beneficiary families.

A main limitation of this analysis is that the matching criteria adopted to compare beneficiary and non-beneficiary families is based on a set of available observed characteristics. And there may still have other important observable and unobservable factors affecting simultaneously the selection and the evaluations of SWB. Analyses were restricted to the most vulnerable socioeconomic group in Colombia (Stratum 1), which to a large extent minimize the differences between MFA and non-MFA families. Nonetheless, the main sources of unobservable differences between this families may remain from the fact that the enrollment of potential beneficiaries is voluntary, families must attend to an official event and provide documents to prove their eligibility, and

the enrollment may be suspended any time by, among other factors, the lack of accomplishment with the conditionalities.

In order to overcome such limitations, the study takes special efforts to guarantee that treatment and control groups are truly comparable and that the results are robust to different empirical strategies. Results also are consistent with the literature on SWB, reinforcing some strengths and weakness of the CCT. In special, that CCT tends to increase the relative perceptions of income and food insecurity, although conditionalities have positive impacts on the satisfaction with health and education.

Some important conclusions can be derived from these results. First, that CCT may be seen as a temporary rather than as a permanent public policy to attenuate poverty and food insecurity. Although studies have highlighted positive impacts of CCT on objective indicators of income and food consumption, these programs do not provide a stable source of resources and the beneficiary families clearly recognizes their social vulnerability. The second main conclusion refers to the central role played by conditionalities on health and education. Such conditionalities link the transfers to investments in human capital, which are essential to reduce the inter-generational transmission of poverty in the long-run. And beneficiary families largely recognize the benefits of such achievements. Finally, the study also highlights that SWB measures can be a powerful, although not unique, instrument to analyze the effectiveness of public policies. Specially because SWB are able to capture more general aspects of living conditions that are not easily expressed by traditional objective indicators of income and access to basic needs.

Compliance with Ethical Standards

Appendix 1

See Table 10.

Table 10 Goodness-of-fit measures of the matching procedure. Colombia—Stratum 1

Variable	Matching	2008			2013			2016		
		Bias (%)	Red bias (%)	$p > t$	Bias (%)	Red bias (%)	$p > t$	Bias (%)	Red bias (%)	$p > t$
ln per capita income	Before	− 19.9		0.000	− 32.8		0.000	− 21.4		0.000
	After	0.3	98.4	0.935	0.6	98.2	0.841	1.1	95	0.726
Own and paid	Before	4.7		0.131	− 8.5		0.000	− 4.7		0.038
	After	0.4	91.6	0.919	0.4	95.8	0.894	0	99.9	0.999
Urban	Before	− 3.4		0.283	− 16.3		0.000	− 10.7		0.000
	After	1.3	61.7	0.739	− 2.4	85.2	0.362	− 1	90.7	0.729
Male	Before	− 3.1		0.316	− 2.2		0.328	− 2.5		0.280
	After	− 4.2	− 34.6	0.270	0.3	87.2	0.914	1.3	46.3	0.641
Age	Before	− 22.3		0.000	− 50.1		0.000	− 45.4		0.000
	After	1.4	93.5	0.707	0.3	99.4	0.911	0.6	98.8	0.847
Years of education	Before	− 15.8		0.000	− 8.9		0.000	− 4.8		0.038
	After	− 0.9	94.6	0.818	− 0.5	94.1	0.836	− 1.4	70.3	0.608
Uenmployed	Before	4.2		0.172	4.8		0.030	5.5		0.014
	After	0.7	83.7	0.859	− 0.8	84.1	0.781	− 0.8	85	0.782
Married	Before	23.3		0.000	34		0.000	33		0.000
	After	− 4.2	82.1	0.253	− 3.4	90.1	0.172	− 1.6	95.2	0.557
Dependency ratio	Before	45.7		0.000	48.5		0.000	47.8		0.000
	After	4.3	90.5	0.201	4.5	90.8	0.065	3.4	93	0.203
Water	Before	− 7.7		0.012	− 2.2		0.324	− 5.5		0.014
	After	− 0.8	89.6	0.836	0.3	86.8	0.912	− 2.4	56.9	0.409
Sewage	Before	− 8.6		0.006	− 13.1		0.000	− 17.3		0.000
	After	1	88	0.788	− 0.4	96.9	0.879	− 1.7	90	0.546
Waste collection	Before	− 14.2		0.000	− 19.2		0.000	− 15.6		0.000
	After	− 0.7	94.9	0.850	− 2.7	85.8	0.308	− 1.5	90.6	0.615
Atlântica	Before	12.1		0.000	10.9		0.000	7.2		0.001
	After	3	75.2	0.447	− 3.4	68.8	0.214	0.1	99.2	0.985
Oriental	Before	− 4.3		0.174	− 7.8		0.001	− 14.5		0.000
	After	0.7	84.8	0.865	0	99.8	0.996	0.4	97.4	0.886
Central	Before	− 3		0.334	− 4.3		0.056	− 4.9		0.035
	After	− 0.2	93.9	0.962	1.4	66.8	0.584	− 1.2	74.7	0.664
Pacífica	Before	12.4		0.000	14.9		0.000	25.1		0.000
	After	− 3.6	70.6	0.364	2.4	83.9	0.377	2.2	91.1	0.449
Antioquia	Before	3.5		0.260	6.9		0.002	6.4		0.004
	After	− 2	42.5	0.610	0.5	92.7	0.858	− 1	84.1	0.734
Valle	Before	− 30.1		0.000	− 18.3		0.000	− 20.7		0.000
	After	1.8	94.1	0.556	− 0.8	95.5	0.729	− 1	95.1	0.706
San Andrés	Before	− 11.7		0.001	− 15.4		0.000	− 12.8		0.000
	After	0.4	96.8	0.899	0.1	99.6	0.977	0	99.7	0.984
Orinoquía	Before	9		0.003	− 3.4		0.138	− 0.2		0.918
	After	0.9	90.2	0.829	− 0.4	89.6	0.891	− 0.2	32.4	0.957
Colombia Mayor	Before	− 11		0.001	− 19		0.000	− 11.8		0.000
	After	1	91	0.781	− 1.6	91.3	0.488	− 3.2	72.7	0.246
Housing subsidy	Before	11.9		0.000	7.1		0.001	9.1		0.000
	After	3.3	72.3	0.363	1.8	75.2	0.531	− 0.8	90.8	0.761
Other subsidies	Before	19.2		0.000	19.3		0.000	9.9		0.000
	After	4.7	75.4	0.212	− 2.8	85.3	0.322	1.3	86.4	0.655

Source Prepared by the authors based on ENCV
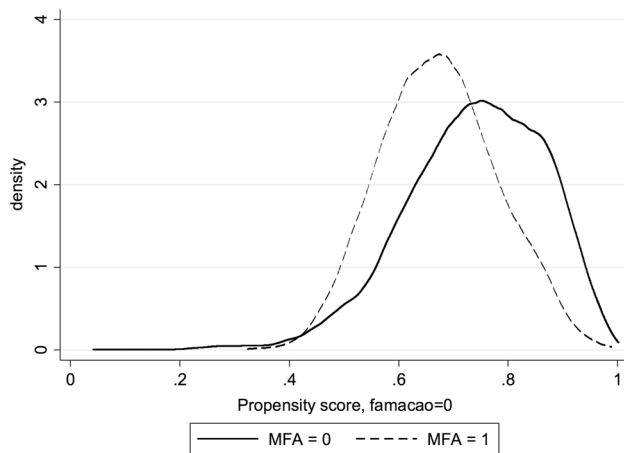
Appendix 2

See Figs. 1, 2 and 3.

Fig. 1 Overlap plot of estimated propensity score. Colombia—Stratum 1—2008. *Source* Prepared by the authors based on ENCV
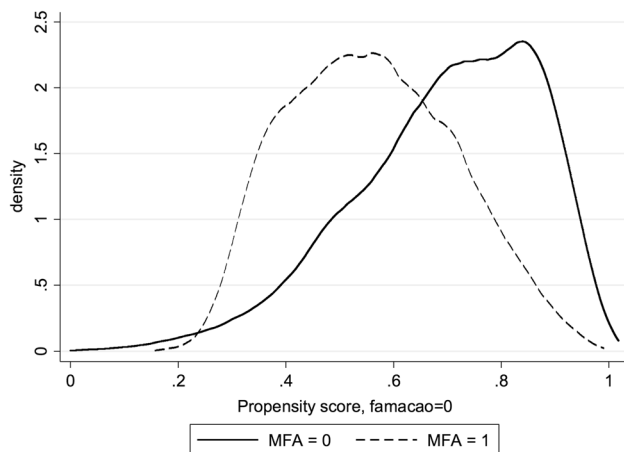

Fig. 2 Overlap plot of estimated propensity score. Colombia—Stratum 1—2013. *Source* Prepared by the authors based on ENCV
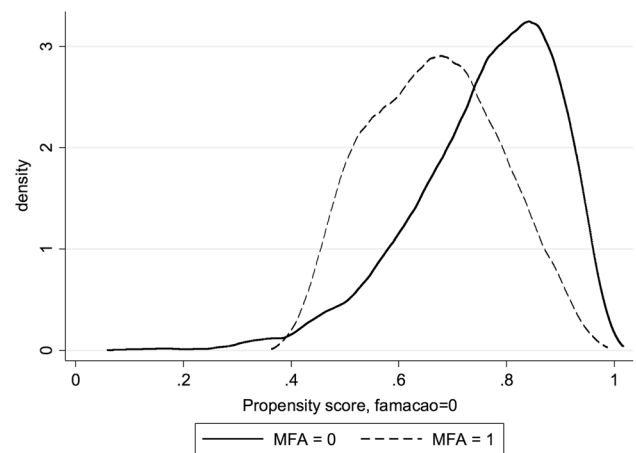

Fig. 3 Overlap plot of estimated propensity score. Colombia—Stratum 1—2016. *Source* Prepared by the authors based on ENCV

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