Social Protection and Food Security in Sub-Saharan Africa: An Evaluation of Cash Transfer Programmes

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ABSTRACT

This paper evaluates the effects of cash transfer (CT) programmes on undernourishment in a sample of African countries during the 1990s and 2000s. We apply the synthetic control method to compare changes in the post-intervention undernourishment trajectories of economies affected by CT programmes with countries that are unaffected. The results suggest that CT programmes exert significant effects on the prevalence of undernourishment in low-income sub-Saharan countries, whereas the impact on dietary energy supply adequacy is more articulated. Robustness analysis via placebo experiments confirms the soundness of our results and their implications for policy-makers are also discussed.

Keywords: Sub-Saharan Africa, Undernourishment, Cash Transfers.
JEL Classification: Q1, Q18, O13

1. Introduction

Recently, threats of financial collapse and global recession, food shortages and rising food prices have exacerbated nutrition vulnerability to adverse shocks[1]. One consequence has been the increased presence of food insecurity even in countries unaffected by recurrent famine (Gentilini

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[1]Following the food and economic crises, in 2009 more than one billion people worldwide were undernourished (FAO 2011). The UN Food and Agriculture Organization (FAO) estimates that in the 2010-12 period, about 870 million people were undernourished (FAO 2012a).

2007; Crawford et al. 2010). A number of inquiries have shown that the relationship between food intake and nutritional achievement could vary greatly depending, amongst other things, on the level of access to complementary inputs such as healthcare, basic education, clean drinking water and sanitation (Dreze and Sen 1989). These analyses supported a pragmatic approach to promoting capabilities and incentives, one that tackled hunger and food insecurity by bridging food assistance and other pillars of social protection (Crawford et al. 2010). In accordance with this perspective, new social protection measures have been implemented in numerous underdeveloped and emerging countries (Gentilini and Omamo 2011).

Social protection programmes targeting the poor, or those who may become poor as a result of adverse shocks, can take many forms: cash transfer (CT) schemes involving welfare payments, child allowances or pensions; in-kind transfers such as food aid or school food programmes; subsidies for goods purchased by the poor; unemployment insurance and public works or workfare schemes. The 'new social protection agenda' includes interventions that link the recipients of cash or food payments to other government services and conditional cash transfer (CCT) schemes (Hoddinott 2012). These programmes provide cash payments to poor households that meet certain behavioural requirements, generally related to children's healthcare, child nutrition and education, with the aim of promoting longer-term human capital investments (Fiszbein et al. 2009).

Despite the abundance of social protection innovations and studies assessing their effectiveness, the literature still lacks inquiries that rigorously measure the effects of such innovations in sub-Saharan Africa (Gilligan et al. 2009)[2]. This paper partially fills this gap by evaluating the effects of CTs introduced in the past 20 years on alleviating undernourishment in Africa. These programmes, which constitute the dominant form of social transfer in this region, can be provided as alternatives or complements to vouchers or traditional food transfer programmes[3]. They deal with short-term poverty by providing guaranteed extra money and serve as insurance against the risk of food insecurity.

This paper contributes to the current literature which determines whether CT has positive shifts in alleviating undernourishment. We use the synthetic control method (Abadie et al. 2010) to evaluate the effects of policy interventions on two indicators extracted by the Hunger Map compiled each year by the Food and Agriculture Organization of the United Nations (FAO): the prevalence of undernourishment (PU) and the dietary energy supply adequacy index (ADESA). These indexes are related to the access to and availability of food, which are two crucial dimensions of food insecurity (FAO 2012b). Following Billmeier and Nannicini (2013), we underline one caveat when interpreting the results obtained with this methodology. Since CT policies vary according to country application and beneficiaries, there is a difficulty when comparing CTs across countries

[2]An exception is Ethiopia's Productive Safety Nets Programme (PSNP), the largest social protection programme in sub-Saharan Africa. The PSNP has been rigorously evaluated across a range of indicators by Gilligan et al. (2009) and Sabates-Wheeler and Devereux (2011), amongst others.

[3]For a discussion of alternative food assistance policy tools, see Gentilini and Omamo (2011).

using quantitative indicators. We overcome this issue by estimating the effect of CT policies as case-specific.

Our results suggest that in the selected eight African countries, CTs have differing effects on the outcomes and in five cases they significantly reduce the prevalence of undernourishment indicator. Conversely, we find a significant impact of CTs on the ADESA only in Rwanda and Sierra Leone. In most of the cases considered here, CTs are part of a large-scale humanitarian response to a food emergency and have immediate effects on food distribution. In other cases, such as in Rwanda and Sierra Leone, CT intervention is more articulated and represents the start up of a development strategy aimed at stimulating demand and triggering food supply response by local production.

The remainder of the paper is organised as follows. In Section 2, we present the data. In Section 3, we discuss methodological issues whereas in Section 4, we provide the results of our empirical analysis, discuss the main results and draw the relevant policy implications. Section 5 concludes the paper by summarising the key issues.

2. Data

In this section, we present the main variables of interest for our analysis. This is based on a large dataset of sub-Saharan African countries for the 1992-2010 period. In particular, the length of the sample period is strongly influenced by data availability.

We attempt to investigate undernourishment through two outcomes that characterise the multidimensional content of food insecurity. The first is the prevalence of undernourishment (PU) which is based on the proportion of the population subject to chronic undernourishment. This measure indicates the population at risk of calorie inadequacy, estimated considering the level of habitual food consumption over one year. It proxies mainly the access dimension of food security at the country level and is extracted from the Food Security Indicators redacted yearly by the Food and Agricultural Organization (FAO 2012b).

Despite the wide adoption of this indicator in food security analyses, a number of questions arise in its use[4]. With regard to content, the indicator's reliance on the distribution of the country's average annual per capita food consumption means that short-term phenomena such as seasonal crises are not covered (Cafiero and Gennari 2011). In addition, chronic hunger is not the only interesting phenomenon that needs to be monitored. The evolution in food production, prevailing dietary composition and the ratio of food expenditure to other basic needs expenditures, such as health services and education, may be equally important in monitoring the state of food security (Cafiero and Gennari 2011). In contrast, the FAO's PU indicator is adequate for our analysis be-

[4]See, for example, Masset (2011); De Haen et al. (2011); Cafiero (2013) for a critical review of methodological issues related to the FAO indicators.

cause the aim is to assess the country-level changes in chronic hunger affected by one specific policy (e.g. CT) and this pattern is not significantly influenced by its main methodological weakness[5].

The second outcome that we use in our analysis is the average dietary energy supply adequacy ($ADESA$) which expresses the Dietary Energy Supply (DES)[6] as a percentage of the Average Dietary Energy Requirement ($ADER$)[7] in the country. Each country's or region's average supply of calories for food consumption is normalised by the average dietary energy requirement estimated for its population in order to provide an index of adequacy of the food supply in terms of calories. Clearly, the goodness of this indicator is associated with the reliability of the underlying official data on production, trade and the extent of various non-food uses. In particular, the literature concentrates the debate on the role of inventory changes which affects the precision of the DES indicator in any single year. For this reason, the data on food availability are corrected for stock variations by averaging over a three-year period (Cafiero 2011).

These indexes are published by the FAO for each country annually and are calculated over a three-year moving average. This methodology is applied to smooth the temporal behaviour of the series excluding short-run fluctuations. This procedure does not weaken the results of the present investigation since our aim is to compare the undernourishment trends within countries that have experienced a CT policy. In this perspective, the use of smooth series reduces unpredictable measurement errors that may bias comparability between the undernourishment trends. Moreover, analysing together the ADESA and the PU indicators enables us to discern whether undernourishment is mainly due to insufficiency of food supply or to particularly bad distribution (FAO 2012b). From an interpretative point of view, countries with low average dietary energy supply adequacy may most need policies for enhancing the means of making more food available to their citizens, while in countries where the prevalence of undernourishment is high, a focus on enhancing the access and distribution of food may be required.

A number of factors, including food market characteristics and household behaviour with respect to food consumption influence these outcomes (Cafiero, 2013). To control for these factors, we extract four additional variables from the FAO data source which we use as covariates in the evaluation procedure: access to improved water sources (AW), access to improved sanitation facilities (AS), the cereal import dependency ratio (CID) and the political stability and absence of

[5]Note that we cannot use anthropometric indicators of under-nutrition, which would give us complementary information, because these measures are not available on a yearly basis and are used only for medium-term assessment of nutritional problems (De Haen et al, 2011).

[6]DES estimates the per capita amount of energy (kcal) in food available for human consumption, during the reference period. The index is expressed in kcal per capita a day. Per capita supplies represent only the average supply available for each individual in the population as a whole and do not indicate what is actually consumed by individuals.

[7]The average of the individual's dietary energy requirement, ADER, is a proper normative reference for adequate nutrition in the population. Its value can be used to calculate the depth of the food deficit (FD), that is the amount of dietary energy that would be needed to ensure that, if properly distributed, hunger would be eliminated.

violence/terrorism index (PSV). Whilst AW and AS reduce the risks of diarrhoea and other diseases that hamper the capacity to convert food into good nutritional outcomes, the CID and PSV have direct effects on a country's probability of experiencing undernourishment (Dreze and Sen 1989; Smith 2000; Masset 2011; UNDP 2012).

In more detail, AW is measured as the percentage of the population with reasonable access to an adequate amount of water from an improved source such as a household connection, public standpipe, borehole or protected well or spring or rainwater collection. Reasonable access is defined as the availability of at least 20 litres per person per day from a source within one kilometre of the individual's dwelling. AS refers to the percentage of the population with at least adequate access to excreta disposal facilities that can effectively prevent human, animal and insect contact with excreta. Improved facilities range from simple, but protected, pit latrines to flush toilets with a sewerage connection. To be effective, these facilities must be correctly constructed and properly maintained.

CID is the sum of imports and production minus exports by region and sub-region. When the international prices of primary commodities start to rise, highly import-dependent countries are likely to suffer, with a consequent increase in undernourishment. This variable can account for weather-related characteristics which are relevant cyclical determinants of food supply.

Finally, the PSV index represents the underlying institutional determinants of food availability. This index measures perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. We use an indicator produced by the Brookings Institution and World Bank Development Research Group which reflects the statistical compilation of survey responses given by a large number of enterprises, citizens and experts in industrial and developing countries, as reported by several survey institutes, think tanks and non-governmental and international organisations. The PSV index varies from approximately -2.5 (weak stability) to 2.5 (strong stability), with an improvement in governance indicating increased food security.

In addition, data on two variables are collected from the World Bank's African Development Indicators. Our variables of interest are the percentage of female pupils at the primary level, including enrolments in public and private schools, and the annual growth rate of per-capita GDP. A discussion of the importance of per-capita GDP for summarising a country's economic condition is omitted to save space. The positive relationship between female education and food security is well documented in the development literature (Behrman and Wolfe 1987; Kassouf and Senauer 1996; Burchi and De Muro 2012). This literature shows that educated women ensure good nutritional outcomes for their families through their capability to make use of information on good health and nutritional practices.

3. Methods: synthetic control approach

When evaluating the effects of CTs on undernourishment, we need to compare countries that have and have not experienced these transfers. The challenge is to find countries that are sufficiently similar in sub-Saharan Africa to ensure that any differences in undernourishment outcomes reflect policy intervention rather than disparities in country characteristics. We follow Abadie and Gardeazabal (2003) and Abadie et al. (2010, 2012) who propose a method based on the synthetic control approach. In this framework, a weighted combination of potential control countries (the synthetic control) is constructed to approximate the most relevant characteristics linked with the undernourishment indicators of the treated countries. Schematically, when a CT is introduced, the synthetic control method is used to estimate changes in the patterns of PU and $ADESA$ by comparing the observable outcome trends with those estimated in countries undergoing no policy intervention.

More formally, given a sample of sub-Saharan African countries indexed by J, we can distinguish between a set of J_1 countries that have introduced a CT policy (treated countries) and a set of J_0 countries that are potential controls for comparison, such that $J = J_0 + J_1$. We define the potential comparison controls as "control group" and suppose that the characteristics of each treated unit may be better approximated by a weighted average of countries in the control group. It is also assumed that the sample is a balanced panel for the time span $t = 1, ..., T$ and includes a number of pre-intervention periods T_0 and post-intervention periods T_1, such that $T = T_0 + T_1$. The synthetic control can then be represented by a vector $(J_0 \times 1)$ of weights $W = w_1, ..., w_{J_0}$, with $0 \leq w_{J_0} \leq 1$ and $w_1 + ... + w_{J_0} = 1$, where W is chosen to better reassemble the characteristics of the treated units in the synthetic control (Abadie and Gardeazabal 2003).

We define X_{j_1} as a $(k \times 1)$ vector containing the pre-intervention characteristics of one treated unit j_1 in the set of treated unites J_1, and X_{J_0} as a $(k \times J_0)$ matrix of the pre-intervention characteristics of the control group. Our intent is to find a set of W^* that minimises the distance $\sum_{m=1}^{k} v_m \left(X_{j_1 m} - X_{J_0 m} W\right)^2$, where $m = 1, ..., k$ and v_m is a weight that reflects the relative importance assigned to the $m-th$ variable when we measure the discrepancy between X_{j_1} and $X_{J_0} W$. By introducing synthetic control weights v_m, we can describe the relevance of the explanatory variable chosen to measure the synthetic control. Indeed, as Abadie et al. (2012) show, we can infer the goodness of the chosen variables by comparing the synthetic control values of each k variable with their simple mean in the control group.

We now focus on Y_1, one vector $(T_1 \times 1)$ of the outcome of unit j_1 in set J_1 in post-intervention period T_1, that is, $Y_1 = (Y_{j_1 T_0+1}, ..., Y_{j_1 T})'$. Symmetrically, we define Y_0 as a matrix $(T_1 \times J_0)$ containing all of the post-intervention characteristics of the countries in the control group. The synthetic control estimator for the countries that experienced CTs in the given period is expressed as the difference between $Y_1 - Y_0 W^*$. Hence, for a given post-intervention period $t > T_0$, the synthetic control estimator for a treated unit j is $Y_{j_1 t} - \sum_{J_0} w^* Y_{J_o t}$. Matching variables X_{j_1} and X_{J_0} are supposed to be the predictors of post-intervention outcomes which are themselves unaffected by

the intervention. Abadie et al. (2010) propose a linear factor model to estimate $Y_1 - Y_0 W^*$ that reduces unmeasured factors affecting the outcome variables.

Controlling for unobservable factors ideally requires a large pre-intervention time span T_0. However, when undernourishment indicators are used as the outcome variables, trade-offs may arise between the length of the time span and their performance. As clarified in the previous section, the temporal behaviour of food insecurity is highly volatile and depends on a series of shocks. For example, epidemics, natural disasters or distractions arising from armed conflicts, can permanently modify the behaviour of the time series, net of the smoothing determined by the average over three years in constructing undernourishment indicators. As another necessary condition to evaluate the effects of CT policies, we need to find a period of time in which no other policies have been implemented which specifically affects undernourishment. As a consequence, a sufficiently long *ad hoc* time span is proposed for each treated country.

To confirm the goodness of our estimated results, we perform a placebo test for each CT intervention on the two undernourishment indicators. We replicate the synthetic control estimate of each treated unit for each country in the control group. In other words, for a given country in subset J_0 that does not implement a CT policy at time $t > T_0$, we expect an unusually large gap in relation to the respective treated country. If we obtain this result, our interpretation is that the analysis provides significant evidence that CTs reduce PU and/or increase $ADESA$. If the placebo tests produce gaps similar to those for the treated countries, in contrast, then our interpretation is that the analysis does not constitute evidence of a significant CT impact on these undernourishment outcomes.

3.1. Case study selection

A preliminary step in the synthetic control method is to identify feasible treated units and the control group. The upper part of Table 1 lists countries that introduced CT policies (treated units) in the sample period, whilst the bottom part lists the control group countries. Appendix A provides the list of programmes being evaluated. The last column in Table 1 shows the sub-Saharan African countries by income class following the World Bank classification (Garcia and Moore 2012). This classification allows us to distinguish CTs implemented in middle-income countries from those offered to low-income countries.

Middle-income CTs often take the form of cash grant programmes planned for the long term. They are usually managed by government institutions and are domestically funded. These CT programmes are stable in nature and focused on social protection without any specificity to food insecurity. For example, they are addressed to vulnerable groups such as the elderly. Conversely, low-income countries implement CTs that are often designed to combat food insecurity within a relatively short period. They are typically non-government programmes that are partially or fully funded by donors. Because they are not centrally administered, the management information sys-

Table 1: Cash transfer policies in sub-Saharan Africa

Country code	Country name	Treatment date	Income group
	Treated units		
LSO	Lesotho*	2005, (2009)	Middle-income
SWZ	Swaziland	2005	Middle-income
BFA	Burkina Faso	2008	Low income
ETH	Ethiopia	2005	Low-income
KEN	Kenya*	2005, (2009)	Low-income
MWI	Malawi	2006	Low-income
RWA	Rwanda	2007	Low-income
SLE	Sierra Leone	2007	Low-income
	Control group countries		
AGO	Angola		Middle-income
CMR	Cameroon		Middle-income
GAB	Gabon		Middle-income
MUS	Mauritius		Middle income
COM	Comoros		Low-income
GIN	Guinea		Low-income
MDG	Madagascar		Low-income
MRT	Mauritania		Low-income
TCD	Chad		Low-income
UGA	Uganda		Low-income
BDI	Burundi		Low-income
CIV	Ivory Coast		Low-income
COG	Republic of Congo		Low-income
LBR	Liberia		Low-income
STP	Sao Tome and Principe		Low-income
TGO	Togo		Low-income
	Countries excluded: not in line with treatment requirements		
BWA	Botswana	1996, 2002	Middle-income
CPV	Cape Verde	1992, 1995	Middle-income
NAM	Namibia	2000	Middle-income
NGA	Nigeria	2008, 2009	Middle-income
SEN	Senegal	2009, 2010	Middle-income
ZAF	South Africa	1990	Middle-income
GHA	Ghana	2008	Low-income
MOZ	Mozambique	1993	Low-income
NER	Niger	2008	Low-income
TZA	Tanzania	2010	Low-income
ZMB	Zambia	2004,2006, 2007,2008	Low-income
ZAR	Dem. Rep. of Congo	2004	Low-income
ERI	Eritrea	2009	Low-income
ZWE	Zimbabwe	2004	Low-income
MLI	Mali	2005	Low-income
	Countries excluded: not in line with control requirements		
GNQ	Equatorial Guinea		Middle-income
SYC	Seychelles		Middle-income
BEN	Benin		Low-income
GMB	Gambia		Low-income
GNB	Guinea-Bissau		Low-income
SDN	Sudan		Low-income
SOM	Somalia		Low-income
CAF	Central African Republic		Low-income

Notes: The income classification of the 48 sub-Saharan African countries presented in the third column follows the World Bank classification (Garcia and Moore 2012). The asterisk for Lesotho and Kenya describe the post-intervention constraint due to the introduction of new policies which affected food security (2009 in parenthesis).

tems of these programmes are usually *ad hoc* in nature. These programmes are generally emergency responses to natural disasters or man-made events and they are not linked to other programmes. Moreover, as Nino-Zarazua et al. (2011) note, we can identify two "models" of social assistance in sub-Saharan Africa: one model includes age-based social transfer programmes and dominate in the middle-income countries of Southern Africa and a second model is based on social transfer programmes that target extreme poverty and food insecurity and is widespread in low-income countries.

The data set covers the period 1992-2010 and we fix a minimum five year pre-intervention period. For inclusion in the set of treated units, a country had to satisfy two narrow and necessary conditions: i) its CT policy had to be implemented after 1996, with a minimum pre-intervention period (e.g., $T_0 = 5$) and ii) only one large-scale CT policy was implemented and other major complementary policies were not implemented. The latter condition was adopted to allow identification of the effects of intervention. Following the application of these conditions, we excluded Botswana, Cape Verde, Mali, Nigeria, Senegal, South Africa, Mozambique and Zambia from the treatment sample. For example, Mali was excluded because it experimented only a small, localised pilot CT programme and implemented a number of supply-side policies that influenced undernourishment.

The exclusion from the treated sample of Ghana and Niger was determined by relevant policies which may affect undernourishment outcomes. For example, in 2004 Ghana introduced subsidies to compensate for higher liquid petroleum gas (LPG), petrol and kerosene prices[8]. With expenditure totalling about 2.2% of GDP, this intervention influencing income and food security determined a distortion of the causal estimation of the subsequent CT in 2008. Similarly, we cannot identify the effects of the implementation of the CT in Niger. Since 2005, the government has made cut-price cereals available to those who need help in recovering from shortages in the previous years and it is likely that the effects on undernourishment outcomes of this significant policy intervention are at least time-correlated with the CT intervention implemented in 2008. In addition, Tanzania and Eritrea were excluded because they had an insufficient post-intervention period. The Democratic Republic of Congo and Namibia were excluded because of missing data. Zimbabwe was excluded since it implemented multiple small-scale CTs starting in the '90s. The final treatment sample comprises 8 countries. Note that in the majority of the middle-income countries, more than one national CT policy was implemented, thus violating condition ii). This condition restricted our analysis to Lesotho and Swaziland in middle-income countries.

The control group was also chosen to satisfy two main requirements: i) the countries therein had not experienced a CT policy or ii) any other policy with indirect but relevant effects on undernourishment. Sixteen countries met both requirements and thus formed the control group after excluding four countries that did not meet the first requirement in the 1992-2010 period.

We also excluded 4 countries (Benin, Gambia, Guinea-Bissau and Central African Republic)

[8]For a discussion, see Grosh et al. (2008).

that did not meet the second condition. The interventions that had important food security implications for these four excluded countries were: i) the Emergency Food Security Support Project (EFSSP) implemented in 2008 by the government of Benin and the World Bank (World Bank 2008b) to assist the population experiencing food insecurity following a food price crisis; ii) a well-structured programme designed to increase household and national food security through an improvement in agricultural productivity, production and producer income introduced by the government of Gambia in 2004 (Republic of Gambia 2005); iii) the EFSSP promoted by the World Bank in Guinea-Bissau in 2008 to rescue the food-insecure population following a food price crisis; iv) several programmes to combat food insecurity launched by international agencies in the Central African Republic where about 45% of the population was living in conditions of food insecurity following the end of the country's civil war in 2005 (World Bank 2008a; Global Food Security 2009).

4. Empirical results

4.1. Estimates

The synthetic estimator is constructed for each country as the convex combination of characteristics that most resembled the matching treated country in terms of the undernourishment predictors.

Table 2 and 3 display the statistical results of a comparison between the pre-treatment characteristics of the actual treated countries and those of the synthetic control estimators. The results highlight the affinity between a country exposed to the CT programme and its synthetic counterpart safeguarding, like the matching estimator, against estimation of extreme counterfactuals (King and Zeng 2006)[9].

The effect of the CT policies is constructed by choosing the weight w^* which minimises the mean squared prediction error ($RMSPE$) of each outcome in the treated country during the pre-CT period. The RMSPE measures the lack of fit between the path of the outcome variables in each country and its synthetic counterpart. The pre-intervention RMSPE for a given country is defined as $RMSPE = \left(1/T_0 \sum_{t=1}^{T_0} \left(Y_{1t} - \sum_{J_0} w^* Y_{J_o t}\right)^2\right)^{1/2}$. The last lines in Tables 2 and 3 confirm with the $RMSPE$ calculation that the data are able to perform consistently in the pre-intervention period.

Table 4 and 5 display the weights of each control country across the synthetic estimates. These weights indicate in the first table that the PU trend in Lesotho prior to CT programme

[9]It should be noted that the mean estimators of the countries that did not implement a CT programme during our sample period do not appear to be suitable for building a control group. In almost all of the treated countries under investigation, there is a large gap in the pre-treatment covariate means relative to the synthetic estimators. These results can be extrapolated from the sources used in the paper or requested from the authors.

Table 2: Descriptive statistics for pre-treatment covariates (Outcome Variable: Prevalence of Undernourishment)

	Lesotho		**Swaziland**		**Burkina Faso**	
	Real	Synt. control (6 countries)	Real	Synt. control (4 countries)	Real	Synt. control (3 countries)
Access to improved water source	79.923	79.617	48.462	57.329	59.125	63.331
Access to improved sanitation facilities	24.615	32.686	50.923	31.067	11.188	20.066
Cereal import dependency ratio	65.500	75.307	54.523	71.948	9.488	22.636
Female primary education level	50.947	48.762	48.496	48.102	41.977	42.147
Political stability and absence of violence	0.028	0.009	-0.068	0.314	-0.077	-1.518
Agricultural population	13.558	13.457	12.840	13.066	16.185	15.739
Growth rate of per-capita GDP	3.109	-1.116	-0.997	-0.441	1.797	0.571
Mean of undernourishment prevalence	16.860	16.802	16.880	16.857	26.320	26.319
RMSPE	0.013		0.017		0.104	
	Ethiopia		**Kenya**		**Malawi**	
	Real	Synt. control (4 countries)	Real	Synt. control (3 countries)	Real	Synt. control (3 countries)
Access to improved water source	25.308	36.647	49.923	55.358	57.417	59.684
Access to improved sanitation facilities	7.154	14.690	27.769	28.646	43.833	43.691
Cereal import dependency ratio	9.090	22.318	22.492	34.934	14.792	58.603
Female primary education level	39.667	45.618	48.915	43.519	48.923	47.754
Political stability and absence of violence	-1.135	-1.132	-1.073	-1.598	-0.276	-0.603
Agricultural population	17.758	14.906	16.936	15.815	15.982	13.950
Growth rate of per-capita GDP	1.001	-0.090	-0.221	-1.812	-1.809	-1.797
Mean of undernourishment prevalence	53.860	53.845	33.92	33.914	27.250	27.232
RMSPE	0.385		0.354		0.249	
	Rwanda		**Sierra Leone**			
	Real	Synt. control (5 countries)	Real	Synt. control (8 countries)		
Access to improved water source	66.071	65.973	44.769	51.047		
Access to improved sanitation facilities	44.929	29.624	11.154	15.393		
Cereal import dependency ratio	24.350	31.907	43.292	26.517		
Female primary education level	50.186	46.790	42.416	47.973		
Political stability and absence of violence	-1.570	-0.949	-1.405	0.094		
Agricultural population	15.679	15.344	14.846	15.327		
Growth rate of per-capita GDP	0.429	0.432	-1.477	-1.615		
Mean of undernourishment prevalence	43.680	43.668	40.360	40.365		
RMSPE	0.848		0.193			

Notes: We report in parentheses the number of countries used to estimate the synthetic control. The "mean" of undernourishment prevalence is averaged for the five-year pre-intervention period. The *RMSPE* is estimated using the real and the synthetic control of prevalence of undernourishment in the five-year pre-intervention period.

Table 3: Descriptive statistics for pre-treatment covariates (Outcome Variable: Average Dietary Energy Supply Adequacy)

	Lesotho		**Swaziland**		**Burkina Faso**	
	Real	Synt. control (4 countries)	Real	Synt. control (15 countries)	Real	Synt. control (5 countries)
Access to improved water source	79.923	70.625	48.462	51.061	59.125	62.888
Access to improved sanitation facilities	24.615	26.385	50.923	50.607	11.188	15.044
Cereal import dependency ratio	65.500	37.078	54.523	76.461	9.488	23.665
Female primary education level	50.946	48.811	48.496	47.833	41.977	41.977
Political stability and absence of violence	0.0283	0.010	-0.068	-0.089	-0.077	-1.369
Agricultural population	13.557	15.018	12.840	13.481	16.185	15.807
Growth rate of per-capita GDP	3.108	0.340	-0.997	1.881	1.797	0.785
Mean of dietary energy supply adequacy	84.341	84.346	82.481	82.323	90.543	90.466
RMSPE	0.219		0.375		0.089	
	Ethiopia		**Kenya**		**Malawi**	
	Real	Synt. control (3 countries)	Real	Synt. control (3 countries)	Real	Synt. control (3 countries)
Access to improved water source	25.308	30.130	49.923	57.096	57.417	67.386
Access to improved sanitation facilities	7.154	25.721	27.769	34.680	43.833	32.206
Cereal import dependency ratio	9.090	25.489	22.492	32.870	14.792	73.761
Female primary education level	39.667	45.795	48.915	47.090	48.923	48.091
Political stability and absence of violence	-1.135	-1.240	-1.073	-1.036	-0.276	-0.762
Agricultural population	17.758	15.201	16.936	14.996	15.982	13.838
Growth rate of per-capita GDP	1.001	0.806	-0.221	-2.544	-1.809	-1.515
Mean of dietary energy supply adequacy	66.047	66.267	73.953	73.775	81.589	81.598
RMSPE	0.824		0.681		0.101	
	Rwanda		**Sierra Leone**			
	Real	Synt. control (5 countries)	Real	Synt. control (3 countries)		
Access to improved water source	66.071	65.062	44.769	59.251		
Access to improved sanitation facilities	44.928	35.479	11.153	26.589		
Cereal import dependency ratio	24.350	25.165	43.292	42.844		
Female primary education level	50.186	46.463	42.415	46.760		
Political stability and absence of violence	-1.570	-1.535	-1.405	-0.584		
Agricultural population	15.678	15.726	14.846	14.767		
Growth rate of per-capita GDP	0.429	0.304	-1.476	-1.494		
Mean of dietary energy supply adequacy	71.937	72.711	73.333	73.329		
RMSPE	0.326		0.396			

Notes: We report in parentheses the number of countries used to estimate the synthetic controls. The "mean" of dietary energy supply adequacy is the average in the five-year pre-intervention period. The *RMSPE* is estimated using the real and synthetic control of dietary energy supply adequacy in the five-year pre-intervention period.

implementation is best represented by the combination of Gabon (0.657), Republic of Congo (0.107) and six other countries for its complement (0.235), whilst the other countries have $W-weight=0$. We extend this interpretation by creating counterfactual samples for all of the columns in Table 4 and 5 which represent the weight of estimates in countries subjected to a CT programme.

Table 4: Comparison countries for each selected treatment unit (Variable: Prevalence of Undernourishment)

	Lesotho	Swaziland	Burkina Faso	Ethiopia	Kenya	Malawi	Rwanda	Sierra Leone
Angola	0.000	0.013	0.040	0.434	0.000	0.000	0.064	0.000
Burundi	0.000	0.000	0.159	0.151	0.312	0.350	0.134	0.000
Benin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ivory Coast	0.000	0.000	0.000	0.000	0.688	0.000	0.000	0.000
Cameroon	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.000
Republic of Congo	0.107	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Comoros	0.097	0.107	0.000	0.380	0.000	0.000	0.310	0.273
Gabon	0.658	0.000	0.000	0.000	0.000	0.514	0.000	0.000
Guinea	0.000	0.000	0.801	0.000	0.000	0.000	0.000	0.000
Liberia	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Madagascar	0.064	0.000	0.000	0.000	0.000	0.025	0.105	0.713
Mauritania	0.001	0.539	0.000	0.000	0.000	0.000	0.000	0.014
Mauritius	0.029	0.000	0.000	0.000	0.000	0.096	0.000	0.000
Sao Tome and Principe	0.001	0.340	0.000	0.000	0.000	0.000	0.000	0.000
Togo	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Uganda	0.041	0.000	0.000	0.035	0.000	0.000	0.383	0.000

Notes: Countries and $W-Weights$ for synthetic controls constructed from the best fitting combination of countries.

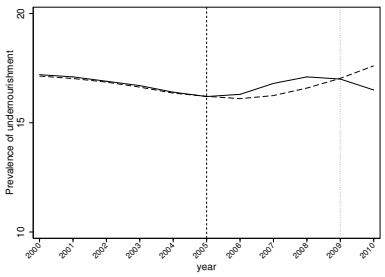
The patterns of the figures we present below show the PU trends in the treated countries (solid line) and synthetic control samples (dotted line) during the 1992-2010 period with the results of the placebo tests alongside. We first consider the two medium-income countries, Lesotho and Swaziland, which introduced CTs in 2005 (Figure 1: panels *a* and *b*). PU in the synthetic Lesotho closely tracks the trajectory of this variable in the pre-treatment period (panels *c* and *d*). Along with the previous estimates of the pre-treatment covariates, the synthetic Lesotho thus provides an approximation of the PU that would have been recorded in Lesotho after 2005 in the absence of any CT. Note that the real PU trend shows no change in trajectory following policy implementation. We conclude that CTs did not improve food security in Lesotho[10]. The same pattern and statistical result is shown when we used ADESA as a response outcome (panels c and d). Applying the same line of reasoning to the case of Swaziland, we found that the country's real trend diverged from the trajectory of its synthetic control in an unexpected direction, i.e. there was an increase in undernourishment, immediately after CTs introduction. These results were also confirmed by ADESA, with an unexpected decrease in 2005 of the average of calories after the introduction of the CT.

A different picture emerges for low-income countries. Panels (a) to (f) in Figure 2 show the

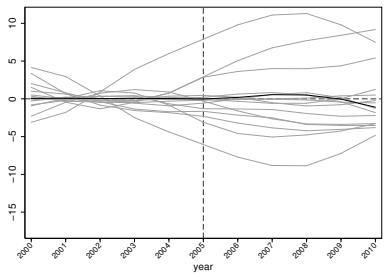
[10]In the case of Lesotho, we stopped our analysis before 2009 when a second CT programme, the Child Grants Programme, was introduced.

Fig. 1.— Cash transfer policies and food insecurity, Middle-income countries

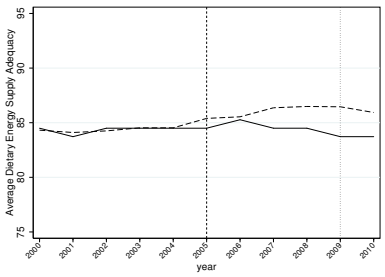
A. Lesotho



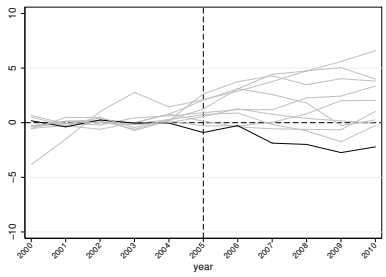
(a) estimate



(b) placebo test

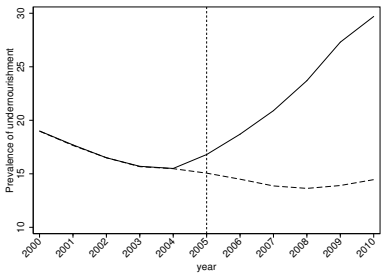


(c) estimate

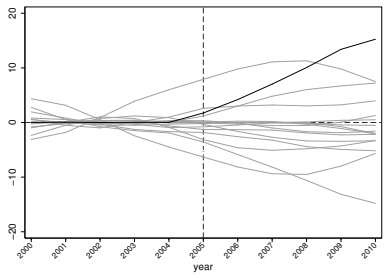


(d) placebo test

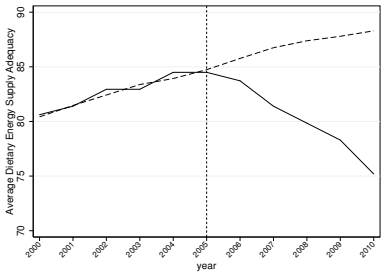
B. Swaziland



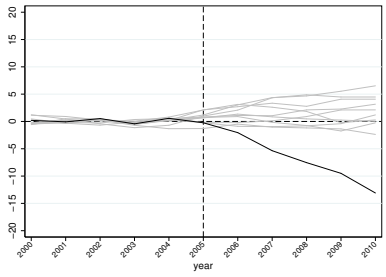
(e) estimate



(f) placebo test



(g) estimate



(h) placebo test

Notes: The solid line shows the real behaviour of the PU variable, whereas the dotted line is the synthetic control. The covariates used for the synthetic controls are reported in Table 2 and the country weights in Table 4.

Table 5: Comparison countries for each selected treatment unit (Variable: Average Dietary Energy Supply Adequacy)

	Lesotho	Swaziland	Burkina Faso	Ethiopia	Kenya	Malawi	Rwanda	Sierra Leone
Angola	0.000	0.342	0.000	0.640	0.000	0.000	0.087	0.063
Burundi	0.000	0.000	0.000	0.067	0.000	0.183	0.352	0.234
Benin	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000
Ivory Coast	0.000	0.001	0.098	0.000	0.000	0.000	0.000	0.000
Cameroon	0.000	0.005	0.000	0.000	0.000	0.000	0.001	0.000
Republic of Congo	0.000	0.001	0.000	0.000	0.077	0.332	0.024	0.000
Comoros	0.000	0.000	0.000	0.293	0.000	0.000	0.130	0.253
Gabon	0.000	0.001	0.000	0.000	0.000	0.485	0.000	0.000
Guinea	0.000	0.002	0.836	0.000	0.250	0.000	0.000	0.000
Liberia	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Madagascar	0.456	0.055	0.042	0.000	0.000	0.000	0.000	0.214
Mauritania	0.172	0.001	0.000	0.000	0.132	0.000	0.000	0.236
Mauritius	0.125	0.350	0.000	0.000	0.000	0.000	0.000	0.000
Sao Tome and Principe	0.076	0.232	0.000	0.000	0.541	0.000	0.000	0.000
Togo	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Uganda	0.171	0.002	0.024	0.000	0.000	0.000	0.406	0.000

Notes: Countries and $W - Weights$ for synthetic controls constructed from the best fitting combination of countries.

main outcomes of analysis of the low-income group. The only case which is not significant is Burkina Faso. This result is not surprising because a number of extremely segmented and decentralised CT programmes existed in this country, but it was only in 2008 that the government decided to launch a pilot CT programme with a large coverage as part of a broader project created to help orphans and vulnerable children.

The figure also shows that the PU in the synthetic control estimated for Rwanda, Kenya, Ethiopia, and Malawi displayed a primarily upward trend, whilst the real PU trend in these countries underwent a sharp decline immediately after CT policy intervention[11]. The difference between the two trajectories in subsequent years suggests a large improvement in this undernourishment outcome. The estimate for the ADESA outcome is, on the other hand, less significant. There is a significant increase for the amount of calorie supply after the CT policy only in Rwanda.

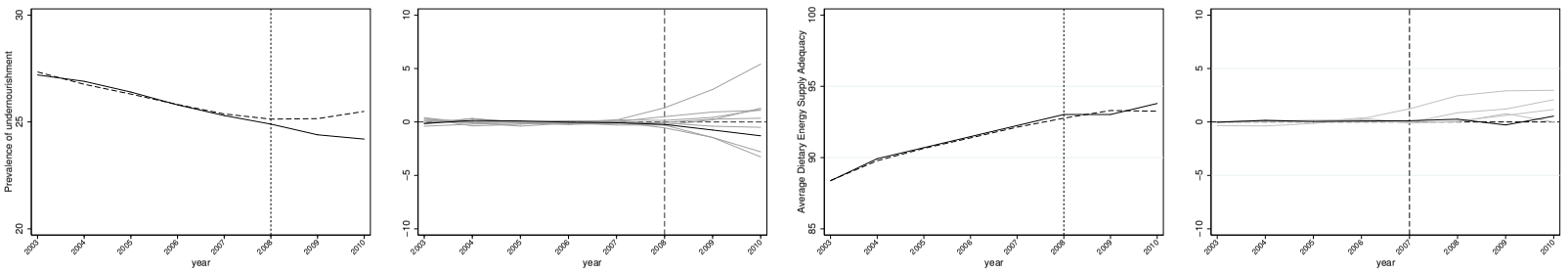
Finally, the estimates show that the PU trend for the synthetic Sierra Leone continued on its moderate downward trajectory, whilst the real trend underwent a sharper decline. In the post-intervention period, we estimated a significant reduction in the prevalence of undernourishment in this country. The placebo test for Sierra Leone presents a clear picture concerning interpretation of the causal effects of CTs on the PU. The CT also significantly affects food calorie supply in Sierra Leone.

It must be stressed that in many cases the introduction of CT programmes is a gradual process

[11]In the case of Kenya, we stopped our analysis before 2009 when a second CT programme, the Hunger Safety Net Programme, was introduced.

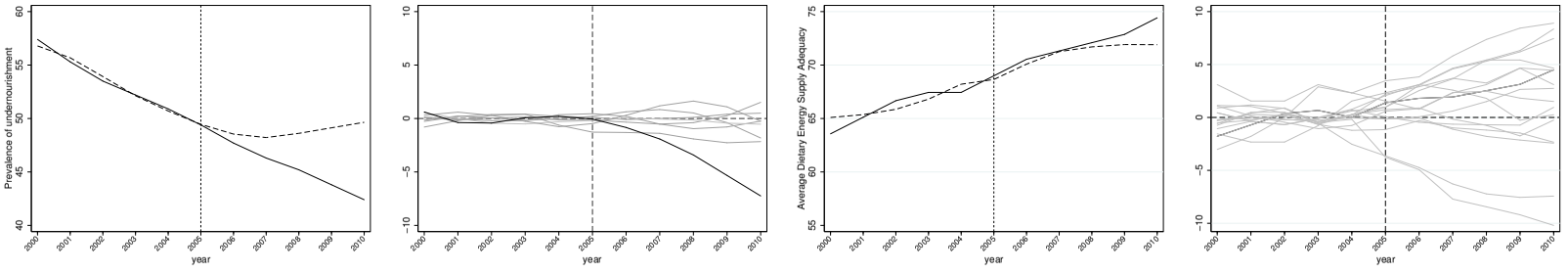
Fig. 2.— Cash transfer policies and food insecurity, Low-income countries

C. Burkina Faso



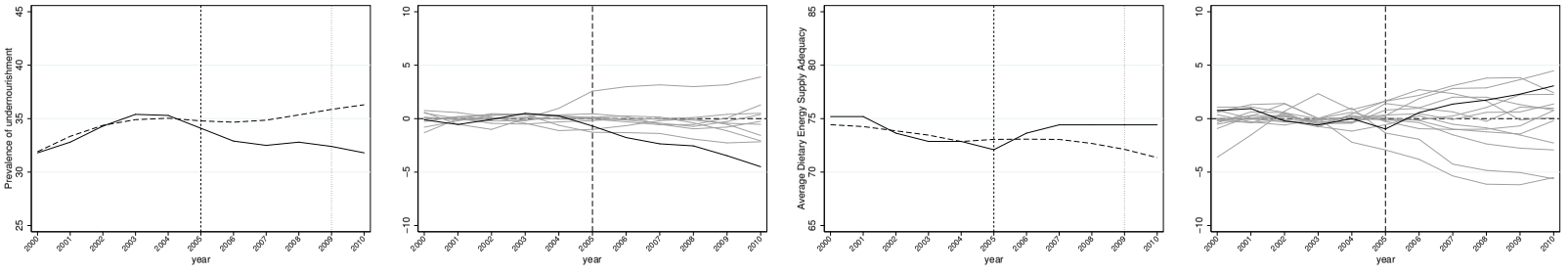
(a) estimate (b) placebo test (c) estimate (d) placebo test

E. Ethiopia



(e) estimate (f) placebo test (g) estimate (h) placebo test

F. Kenya

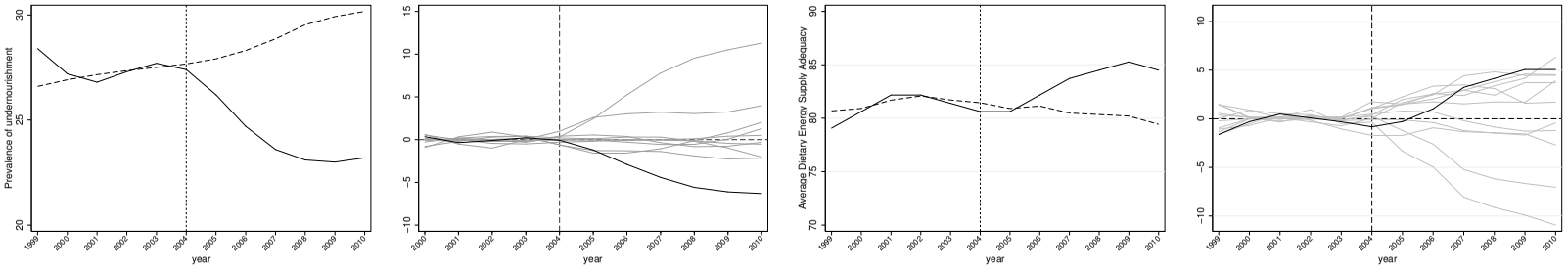


(i) estimate (j) placebo test (k) estimate (l) placebo test

Notes: The solid line shows the real behaviour of the PU and ADESA indicators, whereas the dotted line indicates the pattern of the synthetic control.

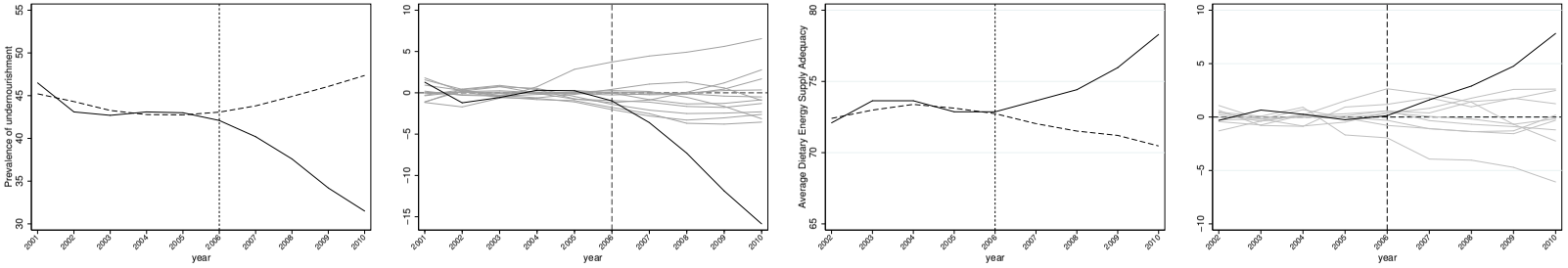
Fig. 3.— *
Cash transfer policies and food insecurity, Low-income countries

H. Malawi



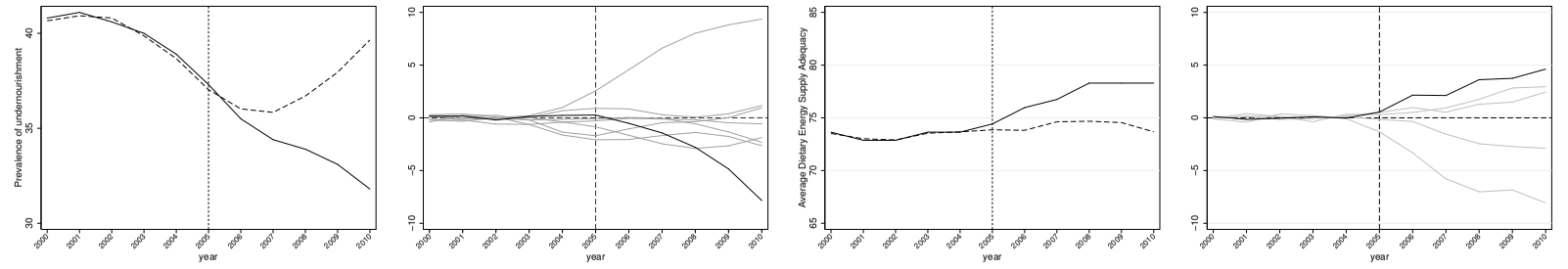
(a) estimate (b) placebo test (c) estimate (d) placebo test

I. Rwanda



(e) estimate (f) placebo test (g) estimate (h) placebo test

J. Sierra Leone



(i) estimate (j) placebo test (k) estimate (l) placebo test

Notes: The solid line shows the real behaviour of the PU and ADESA indicators, whereas the dotted line indicates the pattern of the synthetic control.

that starts with a number of small-scale experiments, involving just a few thousand recipients and funded by external donors, followed by an expansion of cash coverage. For this reason, for some countries (i.e. Rwanda and Sierra Leone) the evidence shows a positive impact on undernourishment before the date of implementation of the official CTs programmes. Despite this limitation that challenges the identification of the policy being evaluated, we stress that in the placebo test the effects of CTs become significant only when the programmes reach a massive scale, thus supporting the robustness of the evaluation.

Table 6 lists the countries where CTs had significant effects on the PU estimates in terms of variations of the outcome over time and the percentage of the population who were undernourished. Table 7 reports the CT effects in countries where the ADESA outcome is also significant. The undernourished population variation is obtained by subtracting the estimated reduction of undernourishment obtained by the synthetic control method from the percentage of undernourished population (based on PU or ADESA). The immediate effects of CT policies are reported in these tables along with the average effects after two and three years. The estimates for years after the third year are not listed because they may be affected by the progressive importance of confounders. Finally, the tables list the total population during the year of intervention to give an impression of the magnitude of the impact. For example, from Table 6, we find that the three-year average effect of the CT in Kenya reduces PU of 2.2 percentage points, whereas in Rwanda decreases about 6.8 percentage points. When we consider the impact of CT in absolute terms of the outcome, the results is slightly different. Using the population in Kenya and Rwanda in the year of intervention - 35 million and about 10 million, respectively - the effect of the CT in Kenya involving about 770,000 people is as important as that the one in Rwanda which involves about 680,000 people. Interestingly, the magnitude of the CT effects had a large effect on undernourishment in Rwanda, Sierra Leone, Malawi and Kenya, with a reduction of between 6.79 and 2.18 percentage points (3-year mean value). A weaker reduction effect of less than 1 percentage point (3-year mean value) was shown in Ethiopia. In some of these countries, CTs induced an immediate increase in the adequacy of the dietary energy supply which complemented the distribution effect proxied by the prevalence of undernourishment index. For example, after three years in Rwanda and Sierra Leone, the ADESA outcome recorded a more than 1.5 percentage point increase.

4.2. Discussion and policy implications

Our estimates provide some insights into the way in which CT implementation in sub-Saharan Africa has influenced outcomes of food security policy, inferring that such interventions have positive effects on the undernourishment of low-income countries. On the other hand, the results obtained for middle-income countries of CT policies are at least ineffective. The two middle-income countries considered here, Lesotho and Swaziland are individually representative and interesting in their specificity. Neither the introduction of the universal Old Age Pension in Lesotho in 2005 in order to reduce the effects of primary commodity price increases on the elderly nor the Old

Table 6: Cash transfer effects on prevalence of undernourishment

Countries	Year of CT	Population CT year	Immediate effect (Previous year)		Average effect two years		Average effect three years	
			Variation (%)	Undernourished Population (%)	Variation (%)	Undernourished Population (%)	Variation (%)	Undernourished Population (%)
Ethiopia	2005	74,980.3	-0.05	49.40	-0.45	48.98	-0.93	48.48
Kenya	2005	34,911.78	-1.00	16.70	-1.60	15.70	-2.18	14.73
Malawi	2006	14,232.79	-1.74	24.70	-2.50	24.15	-3.15	23.80
Rwanda	2007	10,141.08	-3.20	40.20	-4.86	38.89	-6.79	37.33
Sierra Leone	2007	4.918,325	-1.40	34.40	-3.78	33.50	-5.12	32.93

Notes: Yearly effects of policy introduction on the prevalence of undernourishment, along with the two and three year averages, for each country.

Age Grant for poor people over 60 introduced in Swaziland in 2005 had any appreciable effect on undernourishment.

A possible explanation is that Lesotho, like most of middle-income countries, has adopted a rights-based social protection system that already covers a wide range of vulnerable groups. Thus, the effect of various social policies may conceal the positive influence of CTs on undernourishment. In addition, the rapid increase in food prices after 2005 resulted in reduced purchasing power for pensioners and measures such as CTs became inadequate to meet the nutritional needs of this group (Croome et al. 2007).

In Swaziland, in contrast, we have a counterintuitive result: after CT implementation, the indicator of undernourishment increased. The explanation of this result may lie in the simultaneous food crisis that began to unfold its effects in 2005. In the wake of this crisis, CTs proved ineffective in Swaziland for two reasons: their lack of universal coverage and the huge administrative problems associated with the old age grant - e.g., high transfer and disbursement costs and fraud (Garcia and Moore 2012). In fact, Swaziland is a peculiar case facing a number of long-term systemic problems, including the interaction between food insecurity, HIV/AIDS and drought which cannot be addressed by the CTs in place[12] .

The success stories are focused on low-income countries in which CTs have been proved to be effective in enhancing undernourishment. It must be stressed that this analysis does not always clarify the transmission channel through which reductions in the PU are achieved. We speculate that the drivers of CTs' effects on food security improvements are linked to the response of food

[12]See, for a discussion, Masuku and Sithole (2009).

Table 7: Cash transfer effects on average dietary energy supply adequacy

Countries	Year of CT	Population CT year	Immediate effect (Previous year)		Average effect two years		Average effect three years	
			Variation (%)	Undernourished Population (%)	Variation (%)	Undernourished Population (%)	Variation (%)	Undernourished Population (%)
Rwanda	2007	10,141.08	1.60	73.64	2.25	74.03	3.09	74.67
Sierra Leone	2007	4.918,325	2.11	76.74	2,86	77.51	3.16	77.77

Notes: Yearly effects of policy introduction on the average dietary energy supply adequacy, along with the two and three year averages, for each country.

purchases, made possible by changes in household income. In particular, given that food is a luxury for a large proportion of the population in poor countries, the share of food consumption increases with additional income at low levels of total consumption distribution, an argument largely discussed by Ibrahim et al. (2007) using the Ethiopian Urban Household Survey.

We emphasise that generally these CT programmes have been funded by both governments and foreign donors and administered by government institutions, with the universal aim of reducing the socio-economic vulnerability of a large proportion of the population. In most cases, CTs have been a response of the humanitarian emergencies (FAO 2009; United Nations 2009; Harvey et al. 2010), instead of long-term strategies, as in the case of Ethiopia's Productive Safety Net Programm-Direct Support[13].

In the case of Malawi, the CT pilot programme that was launched in 2006 and then scaled up countrywide (the Social Cash Transfer Programme, funded by the government and UNICEF) was a tool within the Government of Malawi's National Social Welfare Policy targeted at ultra poor and labour constrained households. Transfers were provided to female household representatives with the specific purpose of improving both food security and children's school enrolment and attendance (Miller et al. 2010, 2011). The length of the pilot programme and the progressive scale up appears to be a determinant of the success with respect to Kenya. In fact, in Kenya the CT for Orphans and Vulnerable Children targeted at individuals living in HIV-affected households began as a pre-pilot in 2004. The programme expanded the scale and transfer in 2005 attempting to condition transfers on human capital investment in children's health and education (World Bank, 2009). The overall findings related to the cases of Malawi and Kenya contribute to providing evidence in favour of CTs linked to human capital investments and targeted at women and children for their role in

[13]For a discussion of Ethiopia's CT scheme see, Gilligan et al. (2009); Sabates-Wheeler and Devereux (2010); Béné et al. (2012); Jones et al. (2005).

combating hunger and promoting nutrition security (Bassett 2008).

Given that all these interventions aim to promote recovery after an emergency, the improvement of the prevalence of undernourishment indicator is the expected result. Instead, the CTs programmes have had a positive and significant influence on both the undernourishment and energy supply indicators in Rwanda and Sierra Leone. In Rwanda, government designed a social protection policy at the end of 2005, introducing different schemes and interventions to reduce poverty including social transfers to specific vulnerable groups (for example, the Ubudehe Programme). These scattered interventions had a limited impact on poverty because they reached an extremely low number of people and had no systematic coordination (ILO, 2011). In 2008 a new process started which introduced a coherent social protection strategy to replace the plethora of small programmes and fragmented services. In particular, the Vision 2020 Umurenge Programme (VUP) was launched, providing three components to encourage both protection and production: public works, direct support and financial services[14].

Similarly, in 2005 Sierra Leone was recovering from a decade of civil war and introduced the Poverty Reduction Strategy to improve vulnerable groups' access to food, social services and other social safety nets (Holmes and Jackson 2007). The Social Safety Net pilot programme was implemented in 2007 following a community-based approach with the objective of assisting the most vulnerable people, although as discussed above sparse and small cash transfer schemes were introduced to assist post-conflict transition. The beneficiaries were typically the elderly and those lacking a stable income in accordance with the strategic objective of increasing social cohesiveness in the aftermath of the conflict.

In summary, complementarities in development policies for the enhancement of food supply and poverty reduction in Rwanda and the community-driven experience of Sierra Leone show that institutional arrangements are also of paramount importance in determining the effects of CTs on the quantitative measures of undernourishment (Devereux 2009, 2012). This explanation concurs with the views of Harvey and Homes (2007), Holmes and Jackson (2007) and Slater (2009) that social policy in the post-conflict context helps to provide an enabling environment for growth, bridging the gap between crisis and development.

5. Concluding remarks

In this paper, we estimate the effects of CT policies on undernourishment in a sample of African countries. We study the patterns of prevalence of undernourishment and average dietary energy supply adequacy amongst the low- and middle-income countries targeted by CT policies. The availability of similar countries that have not implemented these policies allows us to estimate

[14]For a discussion on social protection in Rwanda, see Jones et al. (2005); Béné et al. (2012); Sabates-Wheeler and Devereux (2011)

the short-to-medium term effects of these programmes under a quasi-experimental framework.

We find that the application of CTs programmes in low-income countries leads generally to a reduction in the prevalence of undernourishment over three years. Conversely, these policies resulted in no significant improvements in food security in countries classified in the middle-income counterparts. Although anticipated or correlated forces may sparsely affect the results of the CT application on undernourishment, our results lead us to conclude that CT policies are important where the reaction of food consumption to impulses in available income is large. The channels through which CTs activate food consumption have been particularly effective when a development strategy has been implemented, either linked to humanitarian or post-conflict emergencies or to comprehensive interventions to reduce poverty. In some of these cases, an increase in ADESA, in addition to an improvement in the distribution of food, is also evident.

Some limitations of the paper must be noted. The first concerns the use of macro-data to assess the impact of CTs. In particular, the estimates based on CT programmes, which are nationwide and widespread, are not obtained through specific control groups, which is possible when using micro-datasets. Moreover, the unconditional nature of the CTs does not necessarily lead to spending the bulk of them on food which may affect the estimates of the effects on the undernourishment.

The second limitation concerns the outcomes used to evaluate the impact of CTs on undernourishment. Since the food indicators are mainly based on caloric availability, the conclusions regarding changes in purchased food are largely related to staple foods. This implies that improvements should be extended, theoretically and empirically, to include diet quality. Both these limitations should be accounted in future works.

Acknowledgment: the authors are grateful to the participants to the conferences "Between Crisis and Development: Which Role for the Bio-Economy" (Parma, June 2013) and "European Public Choice Society 2014 Conference" (Cambridge, April 2014) for their insightful comments.

Appendix A: Treated countries - Major cash transfer programmes

Country/Programme	Start year	Beneficiaries	Spending (annual budget)
Lesotho			
Old Age Pension	2004	78,064 individual beneficiaries (in 2009)	1.4% of GDP (in 2007)
Swaziland			
Old Age Grant	2005	60,000 individual beneficiaries (in 2007)	Varies according to annual funding (US$8.6 million in 2006/2007)
Burkina Faso			
Burkina Faso pilot CCT-CT	pilot 2008	3,250 households (in 2008)	Not available
Ethiopia			
Productive Safety Net Programme - Direct Support	2005	1,200,000 individual beneficiaries (in 2009)	US$414 million (1.38% of GDP in 2009)
Kenya			
CT for Orphans and Vulnerable People	2005 (pre-pilot 2004)	74,000 households (in 2009)	Expected cost US$26 million (in 2010)
Malawi			
Social Cash Transfer	2006	94,386 individual beneficiaries (in 2009)	Expected cost 1.4% of GDP (in 2014)
Rwanda			
Vision 2020 Umurenge Programme	2007	24,400 households (in 2009)	Expected cost US$ 16.7 million (in 2012)
Sierra Leone			
Pilot Social Safety Net Cash Transfer	2007	16,000 individual beneficiaries (in 2012)	Not available

Source: Garcia and Moore (2012).

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