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Article in *Journal of Development Studies* · November 2019

DOI: 10.1080/00220388.2019.1677887

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To cite this article: Leyla Karimli, Bijetri Bose & Njeri Kagotho (2019): Integrated Graduation Program and its Effect on Women and Household Economic Well-being: Findings from a Randomised Controlled Trial in Burkina Faso, The Journal of Development Studies, DOI: [10.1080/00220388.2019.1677887](https://doi.org/10.1080/00220388.2019.1677887)

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# Integrated Graduation Program and its Effect on Women and Household Economic Well-being: Findings from a Randomised Controlled Trial in Burkina Faso

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(Original version submitted October 2018; final version accepted September 2019)

**ABSTRACT** Throughout Sub-Saharan Africa, poverty alleviation programmes have struggled to reach the ultra-poor. To address this challenge, a growing number of agencies are adopting a 'graduation approach' to moving out of extreme poverty into food security and sustainable livelihoods. This study examines the effects of an integrated graduation programme (combining the economic strengthening component with the child well-being sensitisation component) on the economic well-being of women and households in the Nord region of Burkina Faso. Repeated-measures data were collected at three time points from 360 female adult caregivers in a three-arm cluster-randomised controlled trial conducted among the poorest households in the region. Results of multilevel random-intercept mixed-effects models suggest significant effect of the two intervention arms on increased return from market activities and greater assets owned by the women. Results also show an increase in expenditure on children, although not at the same rate as the increases in women's income and profits. Findings provide strong support for the expansion of the graduation approach to help the ultra-poor in different settings. Findings also point to the importance of taking into account existing social relationships within households and suggest the added value of addressing these intra-household dynamics through appropriate programme strategies.

## 1. Introduction

Throughout Sub-Saharan Africa, women contend with policies that impede their property rights and exclude them from financial systems such as credit and insurance. Poverty is believed to have a disproportionate impact on women, as often signalled by higher rates of women's unpaid work, women's employment vulnerability (United Nations Development Programme, 2015), financial exclusion (Demirgüç-Kunt, Klapper, Singer, & Van Oudheusden, 2015), low human-capital investments, and regressive gender roles accounting for women's economic vulnerability (Chant, 2008). In Burkina Faso, which is one of the poorest countries in the world, more than 40% of the population live below the national poverty line of approximately USD 0.73 per day, and the highest incidence of poverty is concentrated in Nord region of the country (Institut National de la Statistique et de la

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This article has been republished with minor changes. These changes do not impact the academic content of the article.  
Supplementary Materials are available for this article which can be accessed via the online version of this journal available at <https://doi.org/10.1080/00220388.2019.1677887>

Démographie [INSD], 2017; Ouoba, 2018). Development agencies have tested multiple forms of social protection within this region including cash transfers and food delivery programmes (Beegle, Honorati, & Monsalve, 2018). More recently, a growing number of development agencies have adopted a ‘graduation approach’ to social protection, combining financial and non-financial services to reach the ultra-poor. Built on the asset-based tradition of poverty reduction, graduation approach programmes seek to support those in extreme poverty to secure sustainable livelihoods (Hashemi & de Montesquiou, 2011).

Support to the ultra-poor has traditionally been in the form of short-term social assistance, providing a brief period of support through food or cash transfers to meet immediate needs. Some scholars argue that supporting the ultra-poor is seen as a less attractive investment of time and resources – compared to focusing on those closer to the poverty line – because of the emphasis in most poverty-reduction programmes is placed on minimising the portion of the population living below the poverty line (Matin, Munshi, & Mehnaz, 2008). While often not directly excluded from asset development programmes such as those providing microfinance services, the ultra-poor typically do not self-select into such programmes because of their limited social assets (Matin et al., 2008).

As one of the poverty-reduction tools, microfinance programmes – referring to a variety of financial services to low-income households – are intended to increase financial inclusion for the poor, leading to improvements in well-being (Armendáriz & Morduch, 2010). Despite an estimated reach of 155 million households globally (Leatherman & Dunford, 2010), microfinance is criticised as being inaccessible to the ultra-poor because the cost of reaching the poorest households is prohibitively high (Amin, Rai, & Topa, 2003; Ghalib, 2013; Hashemi & Rosenberg, 2006; Navajas, Schreiner, Meyer, Gonzalez-Vega, & Rodriguez-Meza, 2000) and reservations by participants about the ability to pay back microfinance loans (Halder & Mosley, 2004). At the same time, cash transfers – another popular poverty reduction intervention – are also limited in that they typically provide only short relief, but rarely promote asset accumulation.

The graduation approach can be seen as a response to the shortcomings of cash transfers and microfinance programmes by generating asset growth among the ultra-poor (Sabates-Wheeler & Devereux, 2011). The graduation programmes, falling within the framework of ‘productive safety net programs’, provide social protection with the aim of creating productive and resilient livelihoods. These programmes combine financial and non-financial services, providing not only cash or in-kind transfers, but also support to build the livelihood assets (Sabates-Wheeler & Devereux, 2013). Asset-based approaches are increasingly considered optimal mechanisms for poverty reduction and a route out of poverty (Carter & Barrett, 2006).

## **2. The graduation approach**

Originally developed and implemented by BRAC in Bangladesh in 2002, the graduation approach was later adopted by the Consultative Group to Assist the Poor (CGAP) – a global partnership of 34 organisations – and has been piloted in several other countries. Graduation approach programmes are characterised as a specific type of a ‘cash plus’ programme, combining cash or asset transfers with additional service components (e.g. sensitisation meetings, psychosocial support) or linkage to social services (Roelen, Devereux, Abdulai, Martorano, & Ragno, 2017). Similar to other cash plus programmes, the graduation approach draws on promotive and transformative social protection that goes beyond providing mere relief from the deprivation; it aims at strengthening recipients’ ability to maintain sufficient livelihoods, remove barriers to social inclusion, and address structural inequalities (Roelen, 2014; Samson, 2015). This emphasis is seen as essential to realising the ambitions of the United Nation’s 2030 Agenda for Sustainable Development, making graduation approaches key to development (Behrandt, 2017).

The process begins by identifying the most vulnerable individuals or households, specifically targeting the ultra-poor. The poorest individuals or households are identified through community-based participatory processes, such as participatory poverty wealth ranking (Hargreaves et al., 2007), followed

by triangulation through surveys and household visits by the programme staff. This method of identifying the poorest households accounts for context-specific experiences of poverty (as opposed to relying solely on national poverty indicators and thresholds) and creates transparency and buy-in at the community level.

Graduation approach programmes consist of four main services offered consecutively to the participants (Hashemi & de Montesquiou, 2011). First, participants are offered a consumption support to meet household's immediate needs. The form of consumption support (i.e. cash vs. in-kind), duration (e.g. offering only during the lean season), frequency, and amount varies across different programmes. Second, once the immediate consumption needs are addressed, households are offered support to save money. The savings component of a graduation approach programme encourages participants to save regularly and formally by mobilising deposits on individual accounts, opening accounts for participants at post offices, creating self-help groups, offering financial literacy programmes, and facilitating village savings options (Hashemi & de Montesquiou, 2011). Third, beneficiaries are offered skills training and regular life skills coaching throughout the programme. This component often takes form as regular (e.g. weekly) household visits by the programme staff.

The final component in a graduation approach programme is asset transfers to launch a livelihood activity. Transferred assets often include cash, livestock, sewing machines, or commodities to start small shops (Hashemi & de Montesquiou, 2011). In some cases, programmes offer additional support to protect assets, such as a veterinarian care for livestock. Viable livelihood opportunities are identified through market analyses usually conducted by the programme staff, with discussions to identify the option that best fits the participants' interests and skill sets.

The graduation approach views social protection as a right, and sees itself as an entry-level programme for those unable to access or benefit from other social protection programmes. Behrandt (2017) argues that graduation is often misinterpreted as graduation from a specific programme or from social protection support entirely, rather than correctly recognised as promoting graduation out of poverty. Behrandt maintains that graduation approaches can play their role in a wider social protection floor by shifting their focus from graduation *out of* social protection to graduation *into* social protection. This aligns with suggestions that graduation approaches can be seen as kick-starting participants' journey with social protection, enabling them to continue to access other resources and opportunities (Halder & Mosley, 2004). Yet, the misinterpretation of the 'graduation' definition sometimes leads people to argue the opposite – that graduation suggests a withdrawal of support – posing a threat to the assumption that social protection should be available for any who need it (Soares & Orton, 2017). However, when graduation is characterised as indicating movement away from poverty, and as one part of a wider social protection floor (Devereux, 2017), these programmes clearly support the recognition of social protection as a right.

### 2.1. Global view of graduation approach programmes

To date, graduation approach programmes have been piloted in several countries, including, Haiti, Pakistan, Honduras, Peru, Ethiopia, Yemen, Ghana, and India (Hashemi & de Montesquiou, 2011). Empirical evidence obtained through rigorous evaluations of some of these programmes points to a range of significant positive effects. For example, a randomised controlled trial of BRAC's graduation approach programme in Bangladesh with total of 7,953 women found significant effect of the programme on expanding participants' self-employment activities; increasing participants' total annual earnings; expanding assets, including accumulation of livestock as well as monetary savings; and improving participants' life satisfaction (Bandiera, Burgess, Gulesci, Rasul, & Sulaiman, 2013).

Similarly, experimental evaluation of the multifaceted graduation approach programme implemented in Ethiopia, Ghana, Honduras, India, Pakistan, and Peru (with total of 10,495 participants) found significant positive effect of the programme on a range of outcomes, such as, per capita consumption, food security, household and productive assets, household income and revenues, mental and physical health and women's empowerment (Banerjee, Duflo, Glennerster, & Kinnan, 2015). It is important to

note that one year after the study, gains on economic variables remained significant, while gains in physical health and women's empowerment declined and were no longer significant. Additionally, the study suggested significant country-by-country variation, which should be explored in the future. Most recent examination of the seven-year post-intervention outcomes found persistent significant increase in household assets, consumption and food security, paid income and livestock revenues, total savings, and individuals' self-reported happiness (Banerjee, Duflo, Chattopadhyay, & Shapiro, 2016)

Another study examined WINGS – a variation of the graduation approach programme – implemented in post-war Northern Uganda, with particular focus on petty business and providing cash transfers rather than livestock (Blattman, Green, Jamison, Lehmann, & Annan, 2016). Results of this study demonstrated a significant increase in non-farm businesses, monthly income, food security, and production-related durable assets (such as livestock, farm equipment, and vocational tools). However, the study found no programme effect on women's empowerment.

### **3. Current study**

In this study, we examine the effects of Trickle Up – a graduation approach programme – on the economic well-being of women and households in the Nord region of Burkina Faso. The intervention was designed and implemented by Trickle Up, an international non-governmental organisation. The programme had four key components including savings, technical skills training, cash transfer with livelihood selection, and ongoing support. These four components were offered to all treatment group participants as a sequenced support, in line with the model's main rationale that sustainable reduction in poverty requires a combination of mutually reinforcing components (Roelen & Devereux, 2019). A variant of this intervention called Trickle Up Plus – combining the graduation approach's economic strengthening and a child well-being sensitisation component – was also examined.

Our study contributes to the body of evidence on the benefits of graduation approach programmes by adding the evaluation of the programme implemented in Burkina Faso to the shortlist of studies conducted across different countries and settings. Yet, in addition to examining the household-level economic outcomes, this study goes further by focusing on women's assets (distinct from household assets) and investigating whether programme participation changes women's investment, income, and profit from various activities. We also examine whether improvements in women's income generation translate into greater assets and savings for the women – within the context of the programme's effect on general household assets and financial security. Furthermore, we examine whether benefits derived from participation in the programme distil down into the overall well-being of children by looking into household expenditure on children below age 16. Evaluation of the exiting graduation approach programmes shows that children in the treatment group, compared to the control group, have significantly lower probability of skipping meals (Banerjee et al., 2016) and increased hours spent by children on livestock rearing and land cultivation (Bandiera et al., 2017). Within the Trickle Up's programme examined in this paper, evaluations found significant positive effect of the intervention on children's depressive symptoms (Ismayilova et al., 2018), exposure to hazardous work and some forms of hazards and abuse (Karimli, Rost, & Ismayilova, 2018), and on the probability of children experiencing physical and emotional violence at home (Ismayilova & Karimli, 2018). However, to our knowledge no study to date explicitly examines the effect of graduation approach programmes on household's expenditure on children.

### **4. Methods**

The study presented in this paper is a randomised controlled trial conducted among the poorest households across twelve villages in the Nord region of Burkina Faso. Burkina Faso is a low-income, landlocked Sub-Saharan country that has recently experienced economic and political shocks in the

form of droughts, coups, and terrorist attacks. The Nord region is one of the 13 administrative regions located near the Sahel desert in northern Burkina Faso and it is characterised by extreme poverty.

#### 4.1. Design

A cluster-randomised design with two treatment arms and one control arm was utilised for this study. Twelve villages located in the Nord Region were randomly assigned to one of the three study arms. Randomisation was conducted at the village level to avoid cross-arm contamination after extensive consultation with community leaders. Due to distances between the villages, minimum communication between the participants from the three arms was expected.

Within each village, the poorest households were identified using the PWR process conducted by community members. The 30 poorest households per village were selected to participate in the study ( $N = 360$  households; 120 in Trickle Up, 120 in Trickle Up Plus, and 120 in control group). Within each household, a female caregiver of a 10–15-year-old child was enrolled in the study. Repeated-measures data were collected at baseline, 12 months, and 24 months from female caregivers ( $N = 360$ ) through interviews in the local language (Mooré). Attrition rate was less than 2 per cent, with total seven cases missing at 24-month follow-up.

#### 4.2. Intervention

The intervention had two treatment arms: (1) economic strengthening based on the graduation approach (Trickle Up) offered to female caregivers, and (2) a combination (Trickle Up Plus) of economic strengthening offered to female caregivers with a child well-being sensitisation component offered to all household members. Trickle Up Plus was designed to incorporate the idea that a supportive family environment can balance the effects of life adversities on children's well-being (Walsh, 2002).

*4.2.1. Trickle Up.* Trickle Up – the economic strengthening component of the intervention – included four main components: (1) savings; (2) technical skills training, (3) cash transfer with livelihood selection, and (4) ongoing support. This intervention did not include the consumption component that is a part of the canonical graduation approach programme. Instead, Trickle Up focused on engaging families in both short-term (e.g. vending) and long-term (e.g. livestock) activities. The quick weekly flow of income from the short-term activities helped families get to the point where they were able to make long-term decisions without having to satisfy immediate consumption needs. Graduation approach programmes without the consumption component have been shown to have positive effects on various outcomes (Blattman et al., 2016). On a more practical note, such a version of the programme also costs less.

*4.2.1.1. Savings.* The savings component of Trickle Up followed the Village Savings and Loans (VSL) methodology to establish self-help groups. Formation of these groups began right after the selection of participants. In order to help participants set up the groups, elect their leaders, and establish their governing rules, participants were offered seven training modules on how to manage the groups and conduct their meetings.

*4.2.1.2. Technical skills training.* Within the technical skills training component of Trickle Up, participants were offered five modules of technical skills training on (1) product identification; (2) competition; (3) market analysis; (4) revenue and expenses; and (5) profit calculation.

*4.2.1.3. Livelihood selection and asset transfer.* As a part of the intervention, participants were offered individual grants of 50,000 CFA (West African CFA franc; approximately \$100 USD at the time) to invest in any activity of their choosing. The choices were usually a petty trade (e.g. sale of peanuts,



condiments, doughnuts, millet beer) or livestock rearing (e.g. goats, sheep). To help participants with their livelihood selection, field agents conducted village-specific market analyses. Individual grants were utilised based on the business plan established by each woman with their field agent as a part of training. Asset transfer occurred after the skills training, 2–3 months after the start of intervention.

*4.2.1.4. Ongoing support.* Ongoing support was offered as monthly coaching visits focused on supporting the women’s activities and encouraging women to meet their business objectives. This component of intervention was launched once the individual grants were disbursed.

*4.2.2. Trickle Up Plus.* The second treatment arm – Trickle Up Plus – combined the economic strengthening included with Trickle Up with a child well-being sensitisation component offered to all household members.

*4.2.2.1. Child well-being sensitisation.* The child well-being sensitisation component was primarily intended to raise the awareness of all members of the household about the context-specific child protection issues (e.g. schooling of children, child abuse and maltreatment, trafficking and child labour, forced and early marriage). Additionally, it addressed normative gender beliefs related to family violence and wives’ role in family decision-making (e.g. wife’s contribution to household economy and decisions affecting child’s future).

### 4.3. Measures<sup>1</sup>

To examine the *household’s economic well-being*, we use the following four measures: (1) household durable asset index; (2) household productive asset index; (3) total number of livestock owned by household, converted in standardised livestock units; and (4) household’s financial security.

We use seven measures of *woman’s economic well-being*: (1) woman’s investment in various income-generating activities (IGA) including growing and selling cash crops, rearing and selling livestock, labour services, and other income-generating activities such as, preparing and selling food or selling condiments, soap, and other small merchandise items; (2) woman’s income from these activities; (3) woman’s profit from these activities; (4) total number of livestock owned by woman; (5) value of livestock owned by woman; (6) durable assets index; and (7) total personal monetary savings reported by woman.

We also examine *household’s expenditure on children* as the sum of all the expenses related to school fees, school supplies, clothing, and health for children below age 16 as reported by female caregiver. All monetary amounts are deflated to November 2014 CFA using the national consumer price index (INSD, 2018).

### 4.4. Analyses

We estimated the effects of the Trickle Up and Trickle Up Plus interventions’ economic strengthening component by using the following difference-in-difference (DD) specification:

$$y_{ivt} = \beta_0 + \beta_1 treat_{vt} + \beta_2 time_t + \beta_3 other_{vt} + \beta_4 treat_{vt}time_t + \beta_5 treat_{vt}.other_{vt} + \beta_6 time_t.other_{vt} + \beta_7 treat_{vt}.time_t.other_{vt} + \beta_7 X_{ivt} + \varepsilon_{ivt}$$

where  $y_{ivt}$  is the outcome for woman or household  $i$  in village  $v$  at time  $t$ .  $treat$  is an indicator variable for the each of the interventions,  $time$  is an indicator variable for the 12 months and 24 months periods, and  $other$  is an indicator variable for the presence of other services and programmes in the village.

There was moderate imbalance in baseline outcomes and covariates across treatment groups, as reported in Table 1. By testing the equality mean variables between each of the treatment and control



Table 1. Baseline descriptive statistics and balance test

Variables	Control (n = 120)		Trickle Up (n = 120)		Trickle Up Plus (n = 120)		Total (N = 360)		Balance Test	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	F	p value
	1	2	3	4	5	6	7	8	9	10
<b>Demographics</b>										
Woman's age	39.32	1.28	36.42	0.24	35.88	0.88	37.22	0.7	2.44	0.15
Age difference with partner/husband	12.02	0.62	12.12	0.62	11.02	0.3	11.74	0.34	1.8	0.21
Marital status: polygamous family	32%	0.06	44%	0.12	42%	0.02	40%	0.04	1.18	0.36
Number of people in the household	7.26	0.16	7.22	0.14	7.1	0.14	7.2	0.08	0.26	0.78
Number of children below age 15	4.2	0.14	4.38	0.14	4.26	0.1	4.28	0.08	0.36	0.69
<b>Women's wealth</b>										
Investment in cash crops	1734.38	370.12	542.58	102.52	989.16	310.72	1088.7	221.56	4.94	<b>0.03</b>
Investment in livestock	331.26	76.64	621.66	152.68	166.66	90.46	373.2	85.84	3.06	0.09
Investment in other IGA	885.16	101.76	588.34	125.78	1004.96	232.06	826.16	108.08	1.96	0.18
Income from in cash crops	7877.7	952.54	3231	405.16	5537.08	1075.32	5548.6	758.08	10.06	<b>0</b>
Income from livestock	1379.16	622.84	2313.34	221.74	364.58	142.3	1352.36	329.22	25.1	<b>0</b>
Income from other IGA	21,991.96	5668.88	9310.42	1217.84	23,501.88	7544.86	18,268.08	3707.06	3.62	.06
Income from labour services	1050	197.88	1620.08	210.96	1747.66	275.18	1472.58	161.48	2.64	.12
Profit from cash crops	6143.34	614.82	2688.42	316.18	4547.92	793.52	4459.88	551.62	12.18	<b>0</b>
Profit from livestock	1047.92	559.04	1691.66	316.56	197.92	78.24	979.16	283.84	10.38	<b>0</b>
Profit from other IGA	21,106.8	5576	8722.08	1339.74	22,496.92	7313.42	17,441.94	3616.96	3.54	0.06
Woman's durable assets	0.04	0.06	-0.12	0.06	0.08	0.12	0	0.06	1.38	0.3
Number of livestock owned by women	0.08	0.02	0.06	0.02	0.06	0.02	0.06	0.02	0.38	0.69
Value of livestock owned by women	3555.42	1450.28	1524.16	541.78	1611.66	576.98	2230.42	619.04	0.8	0.48
Woman's savings	787.3	278.18	536.04	187.22	560	150.1	627.78	127.12	0.28	0.75
<b>Household's economic well-being</b>										
Household's durable assets	0.38	0.06	-0.18	0.16	-0.2	0.22	0	0.12	6.66	<b>0</b>
Household 's productive assets	0.14	0.18	-0.1	0.1	-0.04	0.1	0	0.08	0.62	0.57
Number of livestock owned by household	0.18	0.06	0.18	0.02	0.34	0.1	0.22	0.04	1.1	0.36
<b>Financial security of household</b>										
<i>Borrowed money and didn't return</i>	24%	0.04	31%	0.03	23%	0.02	26%	0.020	2.93	0.1
<i>Borrowed money and returned partially</i>	12%	0.02	8%	0.02	9%	0.02	10%	0.012	1.38	0.29
<i>Borrowed money and returned wholly</i>	20%	0.06	14%	0.03	11%	0.03	15%	0.026	1.09	0.37
<i>Didn't borrow any money</i>	44%	0.03	47%	0.03	58%	0.03	50%	0.025	5.15	<b>0.029</b>
Expenses on children	13,156.62	720.36	14,541.12	2052.68	12,413.54	1191.34	13,370.44	868.44	0.38	0.69

Notes: Columns 1–8 report the mean and standard deviation of respondents in the control and two treatment groups at the baseline. Columns 8 and 9 report the F statistics and p-values of joint significance following OLS regressions of each baseline characteristic on the treatment indicator, with heteroskedastic-robust standard errors clustered at the village level. Logistic regression was used for dummy variable.

groups, we fail to reject the null hypotheses at the 5 per cent level in 21 per cent of the tests. To account for potential bias arising from such imbalance, we controlled for the covariates in all regressions and relied on a DD approach to estimate the effect of the interventions on the outcomes.

Some of the participants in both treatment and control arms benefited from services offered by other organisations, such as cash transfers, food aid, nutrition, and early child development packages. To account for the potential effect from these programmes, we ran a series of interaction tests to understand whether provision of these services shaped the effect of the Trickle Up and Trickle Up Plus interventions.

The coefficient of interest,  $\beta_4$ , is the impact of the interventions on women's and household's outcomes. This is the intent-to-treat impact given the random assignment of the programme and absence of spillover between the villages. To examine the potential effect of any other services and programmes offered to our participants, we tested whether these interventions had differential effects on the treatment and control groups (i.e. whether  $\beta_7$  was significantly different from zero). As a robustness check, we regressed each outcome on the treatment indicator and the baseline outcome, getting similar results.

We used multilevel mixed-effects models that allow estimating subject-specific effects while taking into account clustering of subjects within villages and within-individual correlation, modelling between-village and within-individual variability as a random effect. Linear regression or logistic models were utilised depending on the outcome measures. Standard errors are clustered at the village level. All analyses were conducted in Stata 15 (StataCorp, 2017)

## 5. Results

**Table 1** presents characteristics of the sample at baseline. On average, women participating in the study were 37 years old and 12 years younger than their male partners. About 40 per cent of women lived in polygamous families with number of wives ranging from two to five. The average household consisted of seven people, slightly larger than the average household in rural Burkina Faso (INSD, 2010; Ministère de l'Economie et des Finances, 2008). An average participant at baseline had four children (both biological and non-biological) under her care.

On average, at baseline, women invested the most in cash crop cultivation, followed by investments in other IGA and livestock rearing. The most important source of income and profit was other IGA, with cash crops cultivation being the second most important source of income. Women typically owned just a mobile phone and one item of livestock, on average, and reported mean saving of 628 CFA (approximately \$1 USD). On average, at baseline, a household owned only two items of livestock (mostly sheep, goats, chicken, and in some cases donkey or mule). More than one-third of households at baseline borrowed money; and either did not return it (26%) or returned only partially (10%).

### 5.1. Women's market activities

We first examined how the interventions directly influenced the market activities of women. Results show that women in both the Trickle Up and Trickle Up Plus programmes reported significantly greater investment in cash crop cultivation, livestock rearing, and other IGA; compared to women in the control group. **Table 2** shows that Trickle Up led to increases in investment (the amount of increase ranging from CFA 2,425 to CFA 4,054) by the participating women over the course of 2 years, relative to those in the control group. This is equivalent to 62 per cent and 79 per cent increases in cash crops and other IGAs over the investments of the control group women in the same period. The increase in investment in livestock was greatest at 91 per cent more than the control average 1 year after the programme. However, this was tempered down to 54 per cent after 24 months of the programme. During the second year, the increase in investment in the other two activities increased or remained the same.





For participants in Trickle Up treatment arm, despite investing nearly double of the amount of the control group women in livestock, the income from this activity increased by only 65 per cent and changes in profit were not significantly different from baseline to 12-month follow-up. This could be primarily because the women tended to grow their herds in the short term before starting to sell the animals. The increase in income and profit from other IGAs was the greatest in both periods. Compared to the 12-month follow-up, income and profit from livestock rearing increased significantly at 24 months, while those from crops and other IGAs decreased over time. The changes in income from labour services were not significantly different from zero in both periods.

Women exposed to Trickle Up Plus reported increases in investment, income, and profit in all three activities after 12 and 24 months, compared to the control group. The percentage increases in these amounts, relative to the amounts invested or earned by the controls at the same time, was greater than women participating in Trickle Up. These women invested heavily in other IGAs after 1 year of the programme, with a 300 per cent increase relative to the control group; but the increase was lowered to 100 per cent after 2 years. Consequently, the increase in returns from other IGA was the highest after the first year and declined after 24 months, unlike in the other two activities that continued to see greater investment and returns by the women under Trickle Up Plus.

It is interesting to note that one group of women used the asset transfer of 50,000 CFA (approximately \$100 USD at the time) to increase average investments in existing important sources of income (i.e. other IGAs), while another group chose to shift more towards livestock rearing. For both groups, the spikes in these investments were moderated over time. In the other activities, investment increased over time but profits declined over the same period.

Our findings suggest that, for most of the outcomes, services and programmes offered to our participants by other international agencies did not have a significant differential effect, relative to groups who did not participate in these other programmes. However, the effects of Trickle Up on income and profit from selling cash crops at both 12 months and 24 months and a few other outcomes were significantly stronger for women who also benefited from other programmes. Only in three outcomes – investment in cash crops after 24 months for Trickle Up, investment in livestock after 24 months for Trickle Up Plus, and profit from livestock after 12 months in Trickle Up Plus – did the presence of another programme negatively impact the women.

Additional analyses (available on request) show that positive effect of intervention on income and profit from other income-generating activities (e.g. selling prepared food, condiments, drinks; buying and selling cereal) was significantly stronger for women in the Trickle Up Plus arm (economic strengthening plus child well-being sensitisation) compared to women in Trickle Up arm (economic component only).

## *5.2. Women's assets and savings*

Results in [Table 3](#) show that women in Trickle Up owned significantly more durable assets after 12 and 24 months, compared to women in the control group. There was an approximate 300 per cent increase in their durable asset. They also had significantly more productive assets in the form of livestock – in number and value – at both 12 and 24 months, but the increases were much smaller. The amount in savings for the women also increased significantly. Women in Trickle Up Plus also reported a similarly large increase in durable assets after 12 months. They also enjoyed increases in the other assets, the magnitudes of which were greater compared to the women participating in Trickle Up and after 24 months.

For these outcomes too, we see that external programmes and services did not have an effect significantly different from zero, relative to groups who did not participate in these other programmes. In the handful situations where other programmes did make a significant impact, the effect of Trickle Up was greater for women who also received services within these other programmes.

Table 3. Effect of intervention on women's durable assets, savings, and livestock

Predictors	Durable assets index		Number of livestock owned (in LU)		Value of livestock		Savings	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
Marginal intervention effect: <b>Trickle Up</b>								
at 12 month	<b>0.57***</b>	(0.155)	<b>0.60***</b>	(0.121)	<b>61,054.51***</b>	(7,507.255)	<b>25,490.60***</b>	(3,014.437)
at 24 month	<b>0.70**</b>	(0.241)	<b>0.74***</b>	(0.138)	<b>69,068.09***</b>	(5,036.573)	<b>27,666.71***</b>	(2,583.968)
Additional effect of other programmes at 12 months	0.83	(0.560)	0.21	(0.206)	<b>18,622.58*</b>	(8,746.174)	3,523.86	(2,490.574)
Additional effect of other programmes at 24 months	1.03	(0.621)	0.24	(0.161)	<b>28,282.35*</b>	(13,272.287)	<b>7,652.42***</b>	(1,911.031)
Control mean at 12 months	0.21		0.75		71,915.84		26,849.03	
Control mean at 24 months	0.21		0.94		86,183.42		32,682.66	
Marginal intervention effect: <b>Trickle Up Plus</b>								
at 12 month	0.22	-0.168	<b>1.11***</b>	(0.092)	<b>68,404.55***</b>	(10,575.508)	<b>27,731.06***</b>	(2,526.318)
at 24 month	<b>0.62*</b>	-0.296	<b>1.47***</b>	(0.275)	<b>109,337.52***</b>	(31,468.570)	<b>39,694.89***</b>	(4,081.767)
Additional effect of other programmes at 12 months	<b>1.20*</b>	(0.582)	0.06	(0.139)	5,101.52	(11,007.267)	3,497.74	(1,961.851)
Additional effect of other programmes at 24 months	<b>1.43*</b>	(0.594)	0.30	(0.175)	<b>59,007.06***</b>	(12,868.195)	<b>11,835.88*</b>	(5,488.978)
Control mean at 12 months	0.21		0.75		71,915.84		26,849.03	
Control mean at 24 months	0.21		0.94		86,183.42		32,682.66	

Notes: \*\*\*p < 0.001, \*\*p < 0.01, \*p < 0.05. Boldface type indicates statistically significant results.

### 5.3. Household's assets, financial security, and expenditure on children

Results in Table 4 show significant positive effects for both intervention arms on measures of household's economic well-being that reflect the patterns of increase experienced by the women. Households with women in both Trickle Up and Trickle Up Plus saw massive increases in durable assets at 12 and 24 months after their participation. They also reported increases in productive assets, such as agricultural land and number of livestock, though the amount of change was lower compared to the change in durable assets. In addition, households with women in either treatment group were more likely to borrow the money, relative to their control group counterparts.

For participants in Trickle Up, the programme had a significant effect on increasing the expenditures on children below age 16 at 24 months, but not at 12 months. In contrast, participants in Trickle Up Plus reported spending more on children, compared to their control group counterparts, at both 12 months and 24 months. The increase in expenditure amounts reported by treatment arm participants at 24 months ranged from 19 per cent for women in Trickle Up to 76 per cent for women in Trickle Up Plus. Additional analyses show that the effect of intervention on a household's financial security and household expenditure on children below age 16 was significantly stronger for women in the Trickle Up Plus arm (economic strengthening plus child well-being sensitisation) compared to women in Trickle Up arm (economic component only).

Services and programmes offered by other agencies did not have a differential effect on the treatment versus control women, relative to women who did not participate in these other programmes, except in the case of durable assets owned by households after 12 months and expenditure on children for women enrolled in Trickle Up Plus after 24 months.

## 6. Discussion

This is the first randomised controlled trial testing the effect of a graduation approach in the Sahel region. The intervention sought to move the poorest women out of poverty by giving them an asset transfer, accompanied by other services, such as savings groups and skills training, to assist them in successful utilisation of the money received.

We found that the women who received the intervention based on the graduation approach were economically better off following their participation in the programme. These women reported significant and large increases in investment of cash crop cultivation, livestock rearing, and other IGAs. With greater investments, came greater income and profit from the respective activities. Women in the Trickle Up arm (economic strengthening component only) and women in the Trickle Up Plus arm (economic strengthening combined with the child well-being sensitisation component) experienced similar improvements in outcomes. However, the second treatment arm produced better results than the first in some cases such as increased income and profits from other IGAs, increased expenses on children, and increased financial security of the household. While the difference in terms of the effect of intervention on household expenditure on children can be attributed to the added value of the child sensitisation component, further investigation is required to explain some of the other differences.

Access and control over economic resources are attenuated by socio-cultural factors. Burkina Faso is a country with evidence of unequal allocation of resources within households (Udry, 1996). In such a context, it becomes important to investigate whether the women enjoy the benefits gained from the programmatic interventions in market activities and how they are passed along to the other members of the household. This study suggests that the increased return from market activities led, in turn, to greater assets owned by the women. Women in both treatment arms held more assets in the form of durable goods, livestock, and savings after 12 and 24 months of the programme, relative to women in the control groups. In all cases, the percentage increase in the durable assets of the women was the greatest. The savings groups formed as a part of the graduation approach programme were successful in getting the treatment women to save more, relative to the control group. This being said, increase



**Table 4.** Effect of intervention on household's economic well-being and expenditure on children below age 16

Predictors	Durable assets index		Productive assets index		Number of livestock owned (in LU)		Household's financial security		Household spending on children below 16	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
Marginal intervention effect: <b>Trickle Up</b>										
<i>at 12 month</i>	<b>2.14***</b>	(0.224)	<b>1.33***</b>	(0.145)	<b>1.41***</b>	(0.353)	<b>-1.07***</b>	(0.126)	3,288.75	(3,172.257)
<i>at 24 month</i>	<b>2.44***</b>	(0.314)	<b>0.91***</b>	(0.185)	<b>1.53***</b>	(0.556)	<b>-0.70**</b>	(0.218)	<b>4,802.60**</b>	(1,801.903)
Additional effect of other programmes at 12 months	<b>-0.86**</b>	(0.266)	0.37	(0.380)	0.67	(0.683)	-0.59	(0.441)	6,637.23	(3,637.433)
Additional effect of other programmes at 24 months	-0.06	(0.259)	0.32	(0.252)	<b>0.89*</b>	(0.432)	-0.29	(0.217)	-628.23	(2,761.686)
Control mean at 12 months	0.46		0.36		2.10		1.19		21,766.47	
Control mean at 24 months	0.34		0.53		2.23		1.55		25,343.87	
Marginal intervention effect: <b>Trickle Up Plus</b>										
<i>at 12 month</i>	<b>2.42***</b>	(0.135)	<b>1.11***</b>	(0.172)	<b>3.09***</b>	(0.559)	<b>-1.82***</b>	(0.107)	<b>8,001.41*</b>	(3,320.848)
<i>at 24 month</i>	<b>3.26***</b>	(0.438)	<b>0.86***</b>	(0.180)	<b>3.23***</b>	(0.531)	<b>-1.21***</b>	(0.221)	<b>19,260.83***</b>	(1,988.637)
Additional effect of other programmes at 12 months	<b>-0.79*</b>	(0.322)	0.43	(0.414)	-0.28	(0.659)	-0.46	(0.374)	1,774.18	(4,524.326)
Additional effect of other programmes at 24 months	-0.67	(0.351)	0.17	(0.192)	<b>1.51***</b>	(0.404)	0.38	(0.345)	<b>-7,550.85*</b>	(3,372.132)
Control mean at 12 months	0.46		0.36		2.10		1.19		21,766.47	
Control mean at 24 months	0.34		0.53		2.23		1.55		25,343.87	
Number of villages	1,012		1,012		1,012		1,000		1012	
	12		12		12		12		12	

\*\*\*p < 0.001, \*\*p < 0.01, \*p < 0.05.

Boldface type indicates statistically significant results.

in durable assets indicates that women did not put away all their money to tide over future uncertainties. Our findings – pointing to the lower jump in livestock assets – are in line with previous studies which have dispelled the myth that livestock was utilised to tide over economic shocks (Kazianga & Udry, 2006).

In addition to improved economic outcomes for women, the intervention also had significant effect on improving economic well-being of the household in general, with increases in durable and productive assets. It is important to note that the increases in durable assets owned by other household members were higher than the increase in durable assets of the women. Yet, the increase in household's livestock was lesser than the increase in women's livestock. There was also an increase in expenditure on children, but the gains from the programme did not distil down to the children at the same rate as the increases in income and profits.

When interpreting these promising findings it is important to remember that some households simultaneously benefited from services and programmes offered by other development agencies in the region. Though we controlled for whether a household was affected by any other services and programmes offered to household members, we are unable to control for confounders related to those interventions due to the lack of further information. In other words, receiving additional programmes and services diminished the efficacy of this present study. This outcome clearly invites discussion on the poverty eradication landscape in the region. The global proliferation of economic strengthening interventions and the siloed nature of these interventions mean that different providers might be working in close geographic proximity at any given time. Using rigorous statistical analyses to account for this external effect, we establish that this duplication of services may have deleterious effects on participant well-being.

## **7. Conclusion**

To summarise, we find that the graduation approach in Burkina Faso had a positive effect on the economic well-being of the ultra-poor. This study is especially salient given the economic security barriers faced by women in the region. By providing women with financial tools, cash grants, and access to local markets, the intervention addresses these critical barriers. Provided at per household cost of \$208–228 USD, the programme generates greater income for women after 2 years. The success of this intervention is in line with the previous studies where similar increases have been reported in the overlapping outcomes. It, therefore, provides strong support for the expansion of the graduation approach to help the poor in different settings. Our findings also point to the importance of taking into account existing social relationships within households and communities. The added value of addressing these intra-household dynamics through appropriate programme strategies is shown through increased likelihood of project success demonstrated in our findings.

## **Acknowledgements**

We are immensely grateful to everyone who participated in the conception, design and implementation of the study, particularly, Dr. Leyla Ismayilova (Principal Investigator for this study) from University of Chicago, Jo Sanson, Alexice Tô-Camier, Rachel Nanema, and Yerefolo Malle from Trickle Up, Josh Chaffin from the Women's Refugee Commission, Traoré Marie-Renée from ADEFAD (Aide aux Enfants et aux Familles Démunies), and the members and affiliates of the Child Protection in Crisis (CPC) Learning Network, including Algassimou Diallo, Mark Canavera, Dr. Fred M. Ssewamala, and Dr. Lindsay Stark. We are very thankful for the guidance and support from the local Community Collaborative Board in Burkina Faso. We are thankful to Aubrey Blaker and Niamh Costello for their assistance with reviewing the literature. We are immensely grateful to Dr Joachim De Weerd and Dr Els Lecoutere from the Institute of Development Policy (IOB) at the University of Antwerp for their feedback

on the conceptualization of this paper and initial analyses. We are also thankful to Kayla M. Luttrell for her edits on the final version of the manuscript. Our special gratitude goes to all the children and families who agreed to participate in this study.

The study was implemented through partnership between Trickle Up, Women's Refugee Commission (WRC), and Aide aux Enfants et aux Families Démunies (ADEFAD), and University of Chicago (PI: Dr. Leyla Ismayilova).

The study protocol was approved by the University of Chicago Internal Review Board (IRB13-1481) and the Burkina Faso Ministry of Scientific Research and Innovation Ethics Committee for Research in Health (ECRH). The study is registered with ClinicalTrial.gov (ID: NCT02415933).

Both the dataset and the data analyses codes are available upon request from the lead author.

## Funding

The study was funded by the Children and Violence Evaluation Challenge Fund, a joint initiative funded by the Bernard van Leer Foundation, the Oak Foundation, the UBS Optimus Foundation, and an anonymous donor; hosted by the Network of European Foundations (NEF); and co-funded by the Child Protection Working Group (The United Nations Children's Fund/UNICEF). Its contents are solely the responsibility of the authors and do not necessarily represent the official view of the funding sponsors. The lead author received the Visiting Scholar funding from the Institute of Development Policy (IOB) at University of Antwerp to conceptualise the paper, conduct preliminary analyses and present original results.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Note

1. For detailed description of how each measure was constructed and calculated, please see Supplementary Materials attached to the main manuscript.

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