

Cash Transfers and Labour Supply of Vulnerable Households: Does Household Indebtedness Matter? A Triple-Difference Analysis.

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Abstract

Cash transfer programs aim to reduce poverty, but their impact on labor supply in developing economies is debated, showing heterogeneous, neutral, or even positive effects. Scholars are moving past the classic labor-leisure theory to examine behavioral factors like liquidity constraints and gender dynamics, but the role of household indebtedness remains underexplored. In low-income settings, debt is a significant constraint that can alter how households respond to income transfers and distort both consumption and labor decisions, challenging standard economic models. This study examines how household indebtedness influences the labor supply effects of Ghana's LEAP 1000 cash transfer program, given that beneficiaries had high baseline debt burdens than nationally representative rural populations. Using a quasi-experimental design, we find that indebted beneficiaries increase wage work and non-farm enterprise (NFE) formation but decrease part-time and agricultural employment. The effect further varies by debt type, investment and consumption debt increased NFE formation. Informal debt led to an increase in wage work due to repayment pressures. In contrast, formal debt was associated with an increase in entrepreneurship, especially among women. These findings highlight the need for debt-sensitive cash transfer policies, structured credit access, and gender-focused financial interventions to boost labor market inclusion and economic resilience.

Keywords: Cash transfers; Labour Supply; Household Debt; Ghana; Gender.

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Introduction

Despite sustained global commitments to eradicating extreme poverty, economic deprivation remains pervasive. Sub-Saharan Africa (SSA), in particular, continues to house over 60% of the world's extremely poor, underscoring the region's persistent structural vulnerabilities (World Bank, 2022). In response, governments across low- and middle-income countries (LMICs) have expanded non-contributory cash transfer programs as core policy instruments to alleviate poverty, enhance household resilience, and support human capital development. With over 130 LMICs currently implementing at least one such program, and 40 of 48 African nations doing so, cash transfers are now central to the region's inclusive growth agenda (Gentilini et al., 2022; Honorati et al., 2015; Onyina & Baye, 2024).

Ghana's Livelihood Empowerment Against Poverty (LEAP) 1000 exemplifies this paradigm. Launched in 2015, the program targets extremely poor households with pregnant women or infants, rooted in the "first 1,000 days" model of early childhood investment. Like many unconditional transfers, LEAP 1000 is expected to reduce poverty and enhance welfare through improved consumption, nutrition, and reduced exposure to shocks (Handa et al., 2018; Osei & Turkson, 2022). Yet, as with many social protection interventions, its impacts on adult labor supply remain theoretically and empirically contested.

Classical labor-leisure theory predicts that unearned income should reduce labor effort by relaxing budget constraints (Moffitt, 2002). However, studies from low-income contexts frequently reveal heterogeneous, neutral, or even positive effects on labor force participation (Alzúa & Ripani, 2013; Banerjee et al., 2017; Baird et al., 2018). These divergences have prompted scholars to move beyond static models, highlighting behavioral mechanisms such as liquidity constraints, gendered labor dynamics, or intra-household bargaining (Ardington et al., 2009; Vera-Cossio, 2022). Yet, one critical and underexplored mechanism, particularly in the Global South, is household indebtedness. Debt is not simply a financial statistic, but a behavioral constraint that can reshape how households respond to income shocks, including transfers.

In low-income settings, debt is both prevalent and consequential. Borrowing often reflects strategies to manage income volatility, smooth consumption, or meet basic needs (Collins et al., 2009; Karlan et al., 2014). However, rising evidence also links indebtedness to adverse effects on mental health, food security, and long-term economic resilience, particularly when debt is used for consumption or sourced informally under socially enforced repayment regimes (Russell et al., 2011; Brewer, 2020). From a theoretical standpoint, debt alters the standard permanent income or lifecycle model, potentially distorting both consumption and labor decisions (Carroll, 2001; Zeldes, 1989). While work in high-income countries shows that debt can prompt labor market re-entry or increased work intensity (Butrica & Karamcheva, 2013; Rossi & Trucchi, 2016), such dynamics remain almost entirely absent from evaluations of targeted transfer programs especially in SSA context.

Ghana offers a compelling case to bridge this gap. Baseline evaluations of the LEAP 1000 program reveal that beneficiary households had significantly higher debt burdens than nationally representative rural populations. Debt was pervasive, with households frequently using transfers to repay outstanding loans, yet little is known about how such debt influences labor supply. This study addresses that void by examining how household indebtedness moderates the labor effects of LEAP 1000, distinguishing between debt amount, source (formal vs. informal), and purpose (consumption vs. investment). We analyze multiple labor outcomes, total hours worked, wage labor, agricultural work, part-time work,

and non-farm enterprise (NFE) formation. Given LEAP 1000's focus on women, especially mothers, we analyze gendered heterogeneity in labour supply, as norms around caregiving, credit access, and decision-making shape how debt and transfers interact (Armand et al., 2020; Fletschner, 2009). Using quasi-experimental framework, we find that indebted beneficiaries increase wage work and NFE formation but shift away from part-time and agricultural employment. Beneficiaries experiencing investment and consumption related debt also enhance labour participation, while informal debt pushes households into wage work due to repayment pressures. In contrast, formal debt supports entrepreneurship, particularly among women.

These findings advance the cash transfer literature in three keyways. First, we extend the labor–cash transfer nexus by introducing household indebtedness as a critical, yet often overlooked, dimension (Mochiah et al., 2014; Osei & Lambon-Quayefio, 2021; Vera-Cossio, 2022). Second, we contribute to the growing evidence linking cash transfers to entrepreneurial activity (Blattman et al., 2013; Vera-Cossio, 2022), while highlighting important gender-based heterogeneities (Armand et al., 2020). Finally, we offer policy-relevant insights by showing that debt repayment obligations shape beneficiaries' labor supply responses, underscoring the need to integrate financial behavior into the design of social protection programs.

The rest of the paper is structured as follows: First, we review recent literature on the impact of cash transfers on labour supply. This is followed by a discussion of the program description, data, and methodology. The subsequent sections present the results and discussion, concluding with policy implications.

Related Literature

Research on the interplay between cash transfers and labour supply has long intrigued economists and policymakers, particularly due to concerns over whether such programs distort work incentives. The standard static economic model of labour supply, rooted in Becker's (1965) time allocation framework, posits a trade-off between leisure and labour: as non-labour income increases, individuals may reduce their labour supply in favour of leisure, especially if leisure yields direct utility. Moffitt (2002) formalizes this intuition in the context of public transfers, predicting that unconditional income support can depress labour market participation at both the extensive and intensive margins. Empirical studies in high-income settings have often affirmed these predictions, and some work in developing countries echoes this concern. For example, studies in Malawi (Covarrubias et al., 2012), Kenya (Asfaw et al., 2014), and Lesotho (Daidone et al., 2014) document reductions in paid work following transfer receipt, while broader cross-country evidence also points to mixed or muted labour responses (Alzua et al., 2013; Banerjee et al., 2017; Bosch & Schady, 2019; Daidone et al., 2019). However, this standard static framework is increasingly viewed as ill-suited to the realities of labour markets in LMICs, where underemployment, informality, and pervasive financial constraints dominate household decision-making. In such contexts, attention has shifted toward liquidity constraint mechanisms, which suggest that rather than reducing work, transfers may enable labour force participation by relaxing credit and cash flow barriers.

The relevance of liquidity constraints has garnered a lot of attention in the consumption theory literature and has been attributed to causing individual's consumption behaviour to divert from the standard permanent income/lifecycle model (Caroll, 2001; Zeldes 1989). Studies have also affirmed

that the adjustment of households in response to liquidity constraints such as household indebtedness is not limited to consumption but also labour supply (e.g. Butrica & Karamcheva, 2013; Camanho et al., 2025; Rossi & Trucchi, 2016).

Pivoting to the cash transfer literature in low-income countries, studies have probed into the liquidity constraints such as the standard lack of access to financial institutions. For instance, Vera-Cossio (2022) shows that in Bolivia, beneficiaries living in areas with lower number financial branches per capita, especially females experienced a positive effect on employment. The simple justification thrives on the liquidity-constraint channel wherein cash transfer simply relaxes the constraints by providing capital to start business (Baird et al., 2018). Also, in South Africa, Ardington et al. (2009) shows how cash transfer impact on labour supply deviates from the conventional income-leisure model by increasing labour supply via the decreasing both credit and childcare constraints allowing prime-adults to migrate to work. Baird et al. (2018) further posits that in LIC and MICs, individuals with liquidity constraints cannot afford search for job for long, so they can either take a low wage job, stop searching and even eschew searching for jobs with high returns but risky. Cash transfer simply may fund longer and intensive search efforts, thereby reducing employment in the short run but as workers take longer time to find a good match, there will be a corresponding increase in wages in the long run. Another simple perspective on the financial constraints distortion the standard static labor-leisure axiom lies in the reduction in the fixed cost to work for program beneficiaries in developing country context (Basu et al., 2010; Cogan, 1978).

Other scholars too have also probed into a simple direct impact of cash transfers on household debt. For instance, Daidone et al., (2019) shows that the initial version of the LEAP program led to a reduction in debt and similarly in Zambia's Child Grant Program and Uganda (Grisolia, 2024). Also, as part of LEAP 1000 evaluation, debt was part of the focal themes considered, as they anticipated that beneficiaries would use the cash to pay them off. At the endline, they find now discernible impact on debt but find that a substantial impact on loans for productive investment (Handa et al., 2018). Qualitative findings also showed that the program also led to an increase in their ability to borrow as people were more willing to lend them money due their status as LEAP beneficiary. Similar anticipatory effects was observed in Kalobeyei, Kenya, Sterck et al. (2020) found that a staggering 89% of the beneficiaries were indebted to the retailers, using the cash transfer as collateral. As a result indebtedness tend to create a havoc of dampening the impact of cash transfer.

What remains missing in the SSA context is a clear conceptual treatment of debt as a heterogeneity dimension in transfer evaluation. Household debt introduces a qualitatively different constraint, one rooted not only in access to finance but also in repayment pressure, social obligation, and financial stress. As such, debt may influence not only whether a household works, but how and where it allocates labour in response to a transfer. This opens a conceptual space for treating debt not merely as a control variable, but as a moderator of cash transfer impacts, probing into its heterogeneous impact such as debt status, debt level, type (investment versus consumption), and source (formal versus informal) as parallel studies have accentuated that the type and source of debt really does play a role in how the labour market response (Butrica & Karamcheva, 2013). Finally, gender constitutes a critical moderating layer in understanding how debt conditions the labor effects of cash transfers. Because LEAP 1000 targets women, especially pregnant and lactating mothers, gendered norms around caregiving, financial control, and labor responsibilities shape how transfers interact with debt to influence behaviour. Differences in access to credit, labor expectations, and decision-making power imply that women and men may respond differently to the same debt-transfer configuration (Fletschner, 2009). Recognizing these dynamics, we analyze labor supply heterogeneity by gender to better capture how social roles further extends the moderating effect of debt.

Institutional Background: LEAP 1000

The LEAP 1000 is an extension of Ghana’s flagship LEAP cash transfer program, launched in 2015 as part of the National Social Protection Strategy. Its central objective is to improve the welfare and developmental outcomes of poor households with pregnant women and children under 12 months. By targeting early childhood, LEAP 1000 aims to reduce stunting, enhance child nutrition, and promote long-term human capital development. The program provides bi-monthly cash transfers to eligible households, along with enrolment into the National Health Insurance Scheme (NHIS) to improve healthcare access. LEAP 1000 is geographically focused in 10 of Ghana’s poorest districts across five regions, selected based on poverty prevalence and health indicators. By 2017, the program had 213,000 beneficiaries across 216 districts.

Eligibility is determined through a community-based targeting mechanism complemented by a proxy means test (PMT). Only extremely poor households with a pregnant woman or a child under one year are eligible at enrollment. Transfers range from GHS 64 to GHS 106 (12-28 USD based on the October 2015 exchange rate) bimonthly, depending on household size. LEAP 1000 represents a shift toward lifecycle-based social protection and a recognition of the critical window of opportunity in early childhood. It also integrates gender-sensitive design, with women as the primary recipients in most beneficiary households. The program was jointly implemented by the Ministry of Gender, Children and Social Protection (MoGCSP), UNICEF, and other development partners. Detailed description of the program can be found in the LEAP 1000 baseline and endline evaluation report (see, LEAP 1000, 2015; Palermo et al., 2018).

Although the program was designed with early childhood development in view, as with standard cash transfer programs, its plausible there are spillover effects on the labour decisions, and whilst scores of studies have looked into the programs impact on outcomes such as birthweight(Quinones et al., 2023), malnutrition (De Groot et al., 2018), intimate partner violence(Peterman et al., 2022), healthcare accessibility(Otieno et al., 2022), among others, and less attention has been to how pre-existing debt of program beneficiaries distort their labour decisions.

Conceptual Framework

We develop our conceptual model following Blundell & MaCurdy (1999). We initially assume a one-period household labour supply model, where a household choose labour supply $l \in [0, L]$, to maximize utility over consumption c and leisure $(L - l)$, subject to a cash transfer T and debt D . The household problem is given as:

$$\max_l U(c, l) = u(c) + v(L - l) \quad \text{subject to} \quad c = wl + T - R(D)$$

where w is the market wage, T is the cash transfer (herein, LEAP 1000). For simplicity we assume that $u(c)$ is increasing and concave in consumption (such as $\log(c)$), and $v(L - l)$ is increasing and concave in leisure. In addition, $R(D)$ is the debt repayment obligation. We can define as a function $R(D) = rD$, where r is the rate of periodic debt repayment.

A debt-free household ($D = 0$), theoretically, will have cash transfer increase non-labor income and potentially reducing labor supply due to the income effect. Conversely, in the presence of debt ($D > 0$): (a) repayment reduces household disposable income; (b) the marginal utility of income rises,

therefore increasing the incentive to work; (c) and if $R(D) \geq T$, the transfer may be fully absorbed by repayment, maintaining liquidity constraints. To pin down the labor supply responses, we let l_0^* and l_1^* denote labour supply before and after the transfer. For debt free household ($D = 0$), we expect $\Delta l = l_1^* - l_0^* < 0$ implying an income effect, but in the presence of debt ($D > 0$) we expect $\Delta l = l_1^* - l_0^* \geq 0$ which indicates dominant substitution effect. Herein, we also acknowledge that at the intensive margin, larger debts will certainly increase $R(D)$, tightening liquidity and amplifying substitution effects, while smaller debts may be absorbed without major behavioral change. Thus, labor responses are expected to scale with debt intensity.

Our contribution to the model is accounting for debt heterogeneity. Now consider a household holding two types of debt, that is investment debt (D_I such as farm tools, education, enterprise capital) and consumption debt (D_C such as food, vacation, medical needs). The household problem is now:

$$\max_l U(c, l) = u(c) + v(L - l) \quad \text{subject to} \quad c = wl + T - R_I(D_I) - R_C(D_C)$$

where $R_I(D_I) = r_I D_I$ is investment debt repayment, and $R_C(D_C) = r_C D_C$ is consumption debt repayment. Generally, we expect $r_I < r_C$ since investment debt typically has better repayment terms. The implications of consumption debt (D_C) are consumption debt generates no future returns, repayment of such debt reduces disposable income without productivity gains, and therefore labor supply increases due to tight liquidity and repayment urgency. On the contrary, investment debt (D_I) may yield future income ($y(D_I)$). Additionally, investment debt may induce labour expansion (effort to capitalize on investment), or reduction (if income effect dominates), hence making the labour response is ambiguous.

Beyond debt type, the source of borrowing also signals how labour supply responses to cash transfer receipt. In similar specification above for the type of debt but denoting informal debt source by $R_N(D_N)$ and formal source $R_F(D_F)$ repayment, wherein repayment obligations differ by terms and flexibility. Informal debt, often obtained through family, friends, or community lenders, typically involves shorter repayment horizons, social pressure, and higher implicit costs (Karaivanov & Kessler, 2015). This urgency tightens liquidity constraints and increases the marginal utility of income, thereby inducing higher immediate labor supply $\Delta l \geq 0$. By contrast, formal debt, accessed through banks or microfinance, tends to have structured repayment schedules and lower rates, easing short-term liquidity pressures. This allows households to reallocate transfers toward longer-term investments, such as non-farm enterprises, rather than expanding immediate labor supply. In conclusion, the above model justifies the moderation analysis using debt source/type to access the impact of cash transfer on labour supply.

Data

This study uses secondary data compiled by United Nations Children's Fund (UNICEF), Institute for Statistical, Social and Economic Research (ISSER) in Ghana, University of North Carolina, Chapel Hill (UNC-CH), and Navrongo Health Research Centre (NHRC). The sampling frame, based on MoGCSP targeting data, included 8,058 households across 189 communities that applied for LEAP 1000 in five districts. Of these, 3,619 (44.9%) qualified as beneficiaries, while 4,439 (55.1%) did not. A power computation was conducted to achieve the desired 2,500-household sample size. Using a Regression Discontinuity Design (RDD), the evaluation team selected 1,250 treatment households (below the eligibility threshold) and 1,250 control households (above the threshold). RDD was chosen

because households near the cutoff are likely comparable. To address potential attrition, an additional 250 households (125 from each side) were selected as replacements, prioritizing communities where at least three households had already been sampled to improve field efficiency and minimize costs. At baseline, 2,497 households completed interviews (1,262 treatment, 1,235 control), with 2,331 retained at endline (Palermo et al., 2018). For a detailed review of the sample selection of the LEAP 1000 program, see Palermo et al. (2018), available in the LEAP 1000 evaluation report published by UNICEF.

Table A1 presents survey questions from 2015 (baseline) and 2017 (endline). The analysis includes 4,531 household-year observations from 2,356 unique households. The primary independent variables, cash transfer receipt and debt types (status, amount, investment, consumption, informal, formal), interact to assess how cash transfers influence labour supply. Control variables, including demographics, health, household head characteristics, and insurance status, are integrated to ensure that labour supply variations reflect program effects rather than external factors.

Empirical Strategy

To estimate how household indebtedness moderates the labor supply effects of the LEAP 1000 cash transfer program, we adopt a difference-in-differences-in-differences (DDD) approach. This triple-difference framework is motivated by the structure of our research design, which involves three dimensions: (1) program participation (treatment vs. control), (2) household debt status (indebted vs. non-indebted), and (3) time (pre- vs. post-intervention). The DDD estimator thus captures the extent to which labor market outcomes of indebted households in the treatment group change over time relative to comparable non-indebted households and relative to their counterparts in the control group. This empirical strategy offers two key advantages. First, it isolates the causal interaction between cash transfer receipt and pre-existing debt by controlling for time-invariant group-specific factors and differential time trends that may jointly affect labor outcomes. Second, it enhances identification by leveraging a quasi-experiment embedded in the phased implementation and targeting criteria of LEAP 1000. In doing so, the DDD framework allows us to test whether labor supply responses to transfers are systematically shaped by household indebtedness, beyond the average treatment effect typically reported in the literature. Our baseline specification follows the canonical DDD structure (Angrist & Pischke, 2009), as detailed in the equation below.

$$L_{it} = \theta_0 + \theta_1 T_i + \theta_2 P_t + \theta_3 D_i + \theta_4 (T_i \times P_t) + \theta_5 (T_i \times D_i) + \theta_6 (P_t \times D_i) + \psi (T_i \times P_t \times D_i) + \mathbf{Z}'_{it} \boldsymbol{\phi} + u_{it}$$

Where L_{it} represents the labour market outcome for household i in survey wave t , such that $L_{it} \in \{\text{labour hours in paid-employment, NFE, labour hours agriculture, hours spent in part-time jobs, employment status and total hours}\}$. Household indebtedness (D_i) was measured at the baseline. We considered debt status, debt amount, types of debt (investment debt and consumption debt), and source of debt (formal and informal debts). T_i is the treatment status of the household, which takes the value of ‘1’ if the household with person i received a cash transfer during the LEAP 1000 program and ‘0’ otherwise. P_t is a dummy variable equal to ‘1’ for the endline (2017) and ‘0’ for the baseline (2015). $\mathbf{Z}'_{it}$ is a vector of observable baseline characteristics. These include marital status, age, education, health status, health insurance enrollment, food security, and disability status. u_{it} is the idiosyncratic error term and $\theta_0, \theta_1, \dots, \theta_6, \psi, \boldsymbol{\phi}$ are parameters to be estimated. We focus mainly on the 3 parameters from our empirical strategy, first, θ_4 which captures LEAP 1000 participants not in debt, θ_6 indebted non-beneficiaries, ψ , indebted program beneficiaries which is our main parameter of interest, with the reference category being non-indebted non-beneficiaries, with all this being simply

our intent-to-treat estimate. For all estimations, the reference category is the non-beneficiaries that are not in debt. In all our estimations, we clustered standard errors at the district level to account for potential intra-district correlation and ensure robust inference given the localized nature of program implementation. Identification rests on the parallel trends' assumption that in the absence of the transfer, changes in labour supply among indebted and non-indebted households would have evolved similarly across treatment and control groups. Whilst we do not have multiple pre-treatment period data to verify this axiom, we rely on the RDD used in the sampling design and assess the baseline covariate balance to ascertain to a certain degree to which we fulfil the parallel trends assumption.

Results and Discussion

Table 1: Descriptives and Covariate Balance

Variable	Full Sample		Treated (T)		Control (C)		T-C Diff	P-values
	Mean	N	Mean	N	Mean	N		
	(1)	(2)	(3)	(4)	(5)	(7)	(9)	(8)
Hours Worked Wages	1.164	2329	1.803	1183	1.477	1146	0.3257	0.171
Non-Farm Enterprise	0.216	2329	0.209	1183	0.223	1146	-0.0146	0.393
Hours Work Agric	2.276	2329	2.239	1183	2.314	1146	-0.0749	0.799
Hours Work Parttime Job	0.156	2329	0.146	1183	0.167	1146	-0.0204	0.816
Employment Status	0.176	2329	0.183	1183	0.168	1146	0.0142	0.369
Total Hours Worked	4.075	2329	4.189	1183	3.958	1146	0.2304	0.557
Debt Status	0.362	2329	0.374	1183	0.351	1146	0.0228	0.252
Total Debt Amount (1000 GH)	0.072	2329	0.076	1183	0.068	1146	0.0073	0.332
Investment Debt	0.123	2329	0.123	1183	0.122	1146	0.0013	0.927
Consumption Debt	0.240	2329	0.250	1183	0.229	1146	0.0216	0.222
Informal Debt	0.255	2329	0.255	1183	0.255	1146	0.0005	0.979
Formal Debt	0.107	2329	0.118	1183	0.096	1146	0.0224	0.081
Male	0.916	2329	0.907	1183	0.925	1146	-0.0179	0.119
Age	39.317	2329	40.455	1183	38.142	1146	2.3125	0.000
Household Size	6.660	2329	6.963	1183	6.347	1146	0.6155	0.000
Marital Status (Polygamous)	0.319	2329	0.326	1183	0.312	1146	0.0139	0.472
Marital Status (Monogamous)	0.626	2329	0.618	1183	0.634	1146	-0.0156	0.437
Marital Status (Other)	0.055	2329	0.056	1183	0.054	1146	0.0017	0.858
Education (Primary)	0.086	2329	0.075	1183	0.097	1146	-0.0216	0.063
Education (JHS)	0.055	2329	0.053	1183	0.057	1146	-0.0035	0.714
Education (SHS)	0.036	2329	0.032	1183	0.039	1146	-0.0071	0.353
Education (Tertiary)	0.009	2329	0.008	1183	0.009	1146	-0.0003	0.943
Education (Never)	0.800	2329	0.817	1183	0.783	1146	0.0347	0.036
Disability Status	0.015	2329	0.013	1183	0.017	1146	-0.0048	0.345
Health Status	0.236	2329	0.240	1183	0.231	1146	0.0088	0.616
Health Insurance	0.491	2329	0.481	1183	0.502	1146	-0.0208	0.316
Food Insecurity	2.615	2329	2.636	1183	2.593	1146	0.0423	0.238

Notes: The table shows the descriptive statistics and covariate balance for the treated and control groups. N represents the sample size.

Table 1 presents descriptive statistics at the household level. At baseline, the average household head worked 2.3 hours per week in agriculture, compared to 1.2 hours in non-agricultural wage jobs and less than an hour in part-time work. This suggests that agriculture is the primary employment sector, with only 21.6% of households engaged in non-farm enterprises.

Regarding debt, 36% of households had outstanding loans, averaging GHC 72. Among them, 24% borrowed for consumption needs, while 12% used loans for investment or personal development, such as education. Most loans came from informal sources (relatives, friends, moneylenders), while only 10% accessed credit from formal institutions (banks, cooperatives, NGOs).

Demographically, 92% of households were male-headed, with 63% in monogamous marriages and 32% in polygamous unions. Education levels were low, with 80% having no formal education and only 9% completing primary school. Rural Ghana's poor education infrastructure contributes to this trend. Health-wise, 49% of household heads were enrolled in national health insurance, and less than 2% reported any disability.

In table 1 (columns 3 to 8), we further evaluate the balance of covariates for the treatment and control groups at the household level, using a variety of baseline characteristics for our estimation. We find that all the different measures of labour supply are not significantly different across the treated and control groups at the baseline. With regards to the covariates, only age, household size and education showed some evidence of significant differences among the two groups. These findings are consistent with the thorough testing of mean differences between the groups conducted during the impact evaluation (Palermo et al., 2018). Such results suggest that our sample is largely balanced, indicating that the parallel trends assumption is mostly not violated.

Impact of LEAP 1000 on Indebted Households

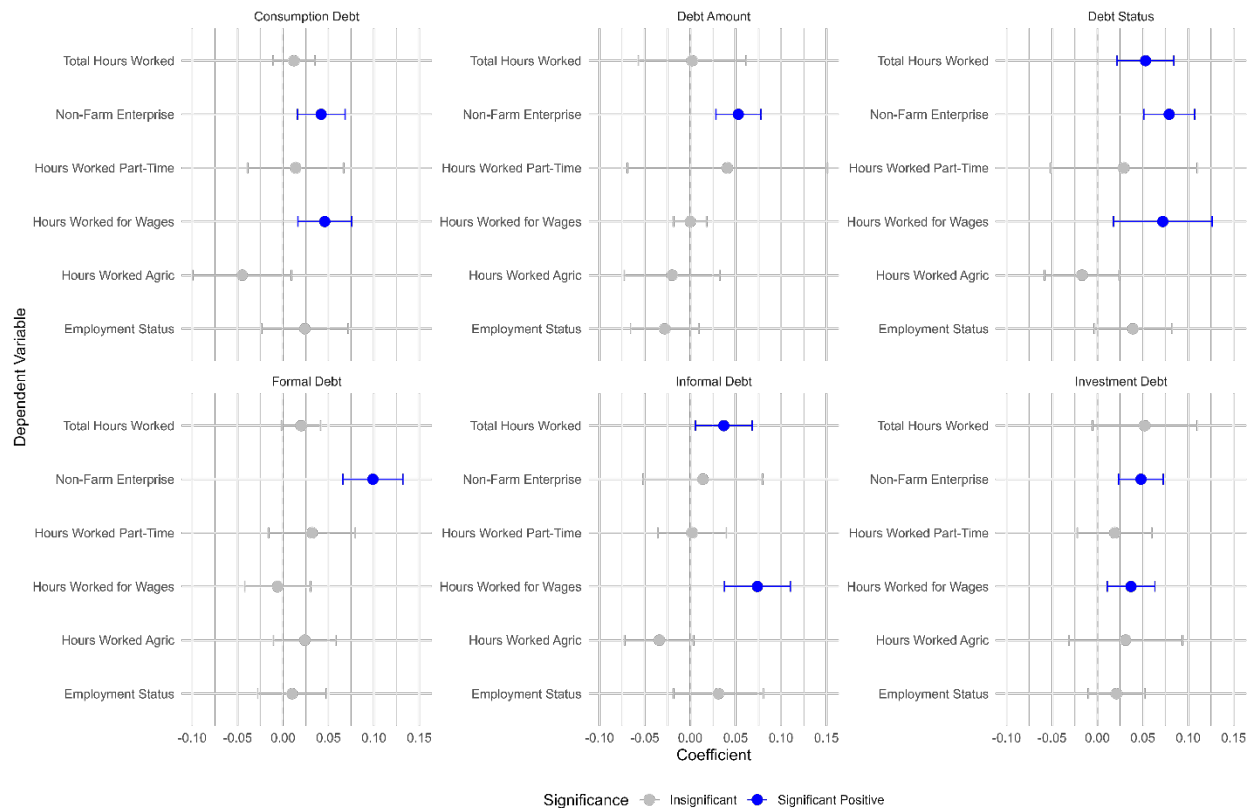


Figure 1: Intent-to-treat effect of LEAP 1000 on the labour supply of the indebted households

Notes: Each coefficient is the standardized coefficient from the triple DDD estimate for the full sample with corresponding controls for sex, age, household size, marital status, education, disability status, health status, health insurance and food insecurity. Horizontal bars are 90% confidence intervals. Robust standard errors were clustered at the district level. Figure conveys the same information as Table OA2 – OA7 - Panel A.

Beginning table OA2-OA3 (Panel A) and figure 1, relative to control, non-indebted households in the pre-intervention period, the cash transfer effect generally reduced labor supply, with declines of 0.057 SD in hours worked for wages and 0.040 SD in total hours worked, reflecting the income effect commonly emphasized in static labor-leisure model (Moffit 2002). Considering debt status, however, indebted beneficiaries recorded increases of 0.072 SD in hours worked for wages, 0.079 SD in non-farm enterprise (NFE) formation, and 0.053 SD in total hours worked. By debt amount, the cash transfer yielded a small gain in employment status (0.003 SD), while households with higher debt levels showed a 0.053 SD increase in NFE formation. This is consistent with the substitution effect under repayment obligations and this was reflected at the intensive margin echoing prior findings that easing credit and liquidity constraints can foster entrepreneurial activity (Ardington et al., 2009; Blattman et al., 2013; Handa et al., 2016; Vera-Cossio, 2022). This pattern also resonates with evidence from Ghana showing that debt pressures often heighten the need for market participation (Mochiah et al., 2014; Osei & Lambon-Quayefio, 2021).

Results by debt type show further heterogeneity (table OA4-OA5 and figure 1). Among households with investment debt, post-intervention outcomes included reductions in NFE formation (−0.055

SD), agricultural work (-0.059 SD), and total hours worked (-0.055 SD), though beneficiaries in this group recorded increases of 0.037 SD in hours worked for wages and 0.048 SD in NFE formation. Although surprising at first glance, this pattern is consistent with our framework. Indebted non-beneficiaries face repayment obligations that dominate the household budget, limiting liquidity and curtailing labour capacity. By contrast, beneficiaries with similar debt see repayment pressures eased by transfers, freeing resources for productive engagement (Ardington et al., 2009).

For those without consumption debt, the cash transfer reduced hours worked for wages (-0.037 SD) and employment status (-0.019 SD), yet indebted beneficiaries showed increases of 0.046 SD in hours worked for wages and 0.042 SD in NFE formation all relative to the those without pre-existing debt in the baseline period. Households without consumption debt treat transfers as pure income, so the income effect dominates and labour supply falls. By contrast, indebted beneficiaries face repayment needs that raise the marginal utility of income; when transfers arrive, they relax immediate liquidity constraints while still leaving repayment incentives in place. This shifts behaviour toward greater wage work and non-farm enterprise activity, consistent with substitution effects under debt pressure.

Finally, disaggregating by debt source (table OA6 and OA7 and figure 1), the cash transfer reduced hours worked for wages (-0.052 SD) and total hours worked (-0.028 SD) among households without informal debt, consistent with the income effect. Whilst beneficiaries with informal debt experienced increases of 0.074 SD in hours worked for wages and 0.037 SD in total hours worked. In line with conceptual model, we argue that informal debt, which often comes with high repayment urgency and limited flexibility, leads to a significant increase in hours worked for wages (Camanho, 2015). Notwithstanding, indebted non-beneficiaries with informal debt experienced a decline in hours worked for wages and employment status by 0.097 SD and 0.091 SD respectively and similarly, this posits a binding liquidity constraint, as urgent and inflexible repayment terms in informal credit markets restrict households' capacity to sustain stable labour participation.

For household heads without formal debt, the program reduced hours worked for wages (-0.017 SD) and total hours worked (-0.017 SD). We find a contrasting impact on the labor decisions of indebted non-beneficiaries find a decline in NFE formation by 0.100 SD and increase in hours spent on parttime jobs by 0.036 SD. For non-beneficiaries with formal debt, reduced non-farm enterprise activity likely reflects repayment obligations tightening liquidity and limiting capacity for business investment. The simultaneous increase in part-time work suggests households shifted toward flexible, low-capital activities to generate immediate cash flow, consistent with substitution toward short-term income under repayment pressure. Beneficiaries with formal debt recorded a 0.099 SD increase in NFE formation. Consistent with our conceptual framework, formal borrowing, often structured with fixed repayment terms and lower interest rates, provides a stable financial framework, enabling beneficiaries to plan and invest in long-term entrepreneurial activities.

Heterogeneity Analysis by Gender

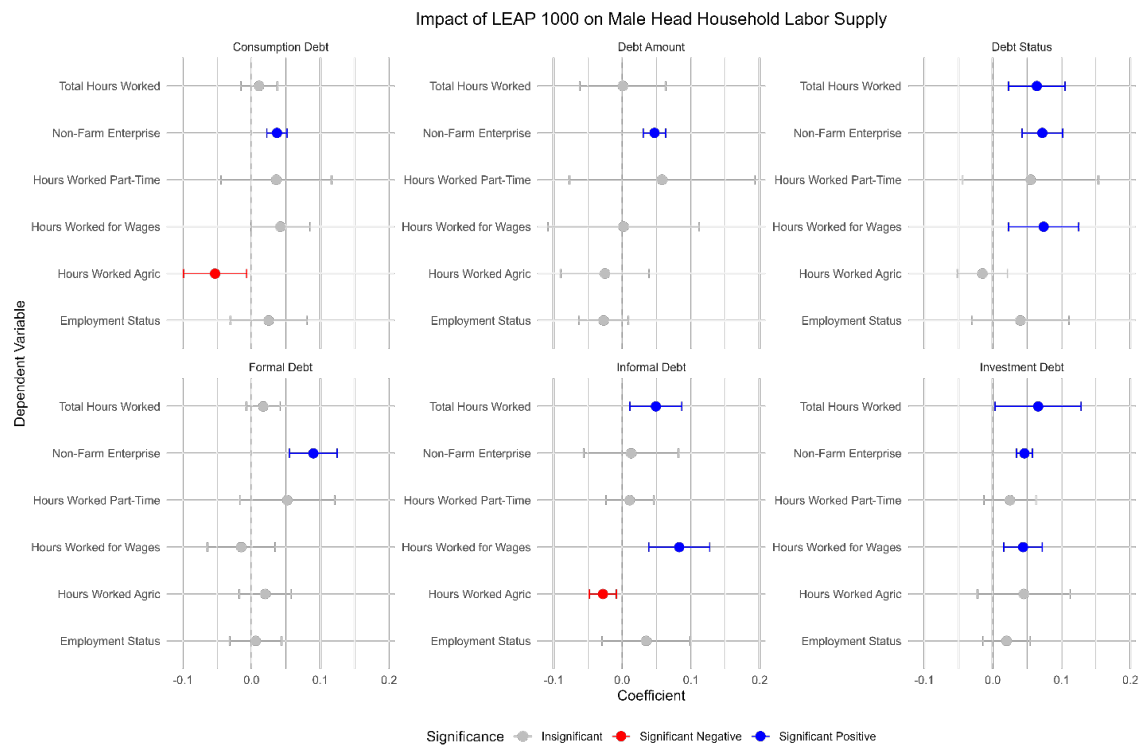


Figure 2: Intent-to-treat impact of LEAP 1000 on the labour supply of the indebted male household head.

Notes: Each coefficient is the standardized coefficient from the triple DDD estimate for the male sample with corresponding controls for sex, age, household size, marital status, education, disability status, health status, health insurance and food insecurity. Horizontal bars are 90% confidence intervals. Robust standard errors were clustered at the district level. Figure conveys the same information as Table OA2 – OA7 - Panel B.

As shown in Tables OA2–OA3 and Figures 2–3, for indebted male beneficiaries relative to the non-indebted nonbeneficiaries, they experience an increase in hours worked for wages, NFE formation and total hours worked by 0.074 SD, 0.072 SD and 0.064 respectively (similarly for the intensive margin) in sharp contrast to the female indebted beneficiaries who record a decline in part time jobs. This pronounced effect on the male household head indebted beneficiaries, aligns with cultural setting wherein men primarily bear the burden of increasing labour supply to accommodate household financial obligations.

In terms of the types of debt as shown in tables OA4-OA5 and figure 2-3, male-headed household heads that were beneficiaries and were also in debt, exhibited a similar trajectory of increase in hours worked for wages, NFE formation and total hours worked, whilst the female counterparts experienced a decline in hours on agriculture and total hours worked, all relative to control group. This was not much different from consumption related debt. For men, this reduction in financial strain may have facilitated resource reallocation from investment debt into entrepreneurial ventures. Since investment debt typically supports capital accumulation, the additional liquidity from LEAP 1000 likely reduced repayment pressures, allowing greater focus on expanding business activities. However,

for female beneficiaries, the lack of significant effects suggests that other constraints, such as caregiving responsibilities or restricted financial access, may limit their ability to capitalize on debt relief.

Finally, considering the source of debt for the respective genders (tables OA6-OA7 and figure 2-3), male indebted (informal) male household heads that were treated, experienced an increase in hours worked for wages and total hours worked by 0.083 SD and 0.049 SD respectively but a decline in hours worked for agriculture by -0.028 SD and similarly treated households heads in similar circumstance also experienced a decline in their hours for agriculture. In line with our framework, informal borrowing, often sourced from family and community networks, operates within repayment structures that impose immediate financial pressures compels individuals to increase their labour supply. However, this reallocation comes at the expense of agricultural work for and part-time employment, both of which decline among indebted beneficiaries. This suggests a shift from traditional or subsistence-based labour to higher-yielding income sources, as households likely prioritize job stability and immediate cash inflows.

The findings from the formal debt presents an interesting nuance, as across board, as male household head in such debt, records an increase in NFE formation by 0.090 SD and their female compatriots experiences a more pronounced increase in by 0.152 SD coupled with hours spent on agriculture as well, 0.061 SD. This pronounced benefit among the female indebted beneficiaries reinforcing the role of formal credit in facilitating business development and financial independence among women. This finding aligns with previous research on the role of microfinance and formal lending in fostering female entrepreneurship (Acheampong, 2018), but in this case adjacent to cash transfer program relaxing the repayment pressure.

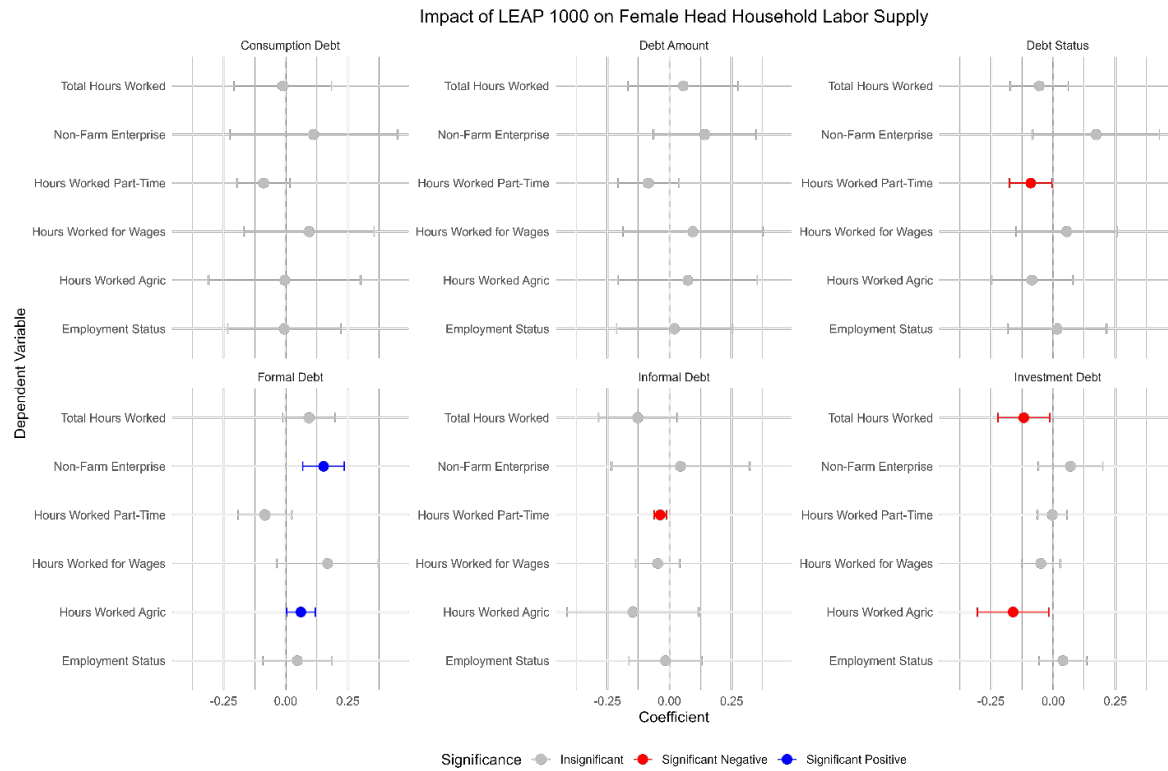


Figure 3: Intent-to-treat impact of LEAP 1000 on the labour supply of the indebted female household head.

Notes: Each coefficient is the standardized coefficient from the triple DDD estimate for the female sample with corresponding controls for sex, age, household size, marital status, education, disability status, health status, health insurance and food insecurity. Horizontal bars are 90% confidence intervals. Robust standard errors were clustered at the district level. Figure conveys the same information as Table OA2 – OA7 - Panel C.

Robustness Check: Adjustment for Multiple Hypothesis Testing

To address the risk of Type I errors from multiple hypothesis testing (108 hypotheses), we applied the Benjamini-Hochberg (BH) adjustment to control for the false discovery rate (FDR) (Benjamini & Hochberg, 1995). Conducting multiple tests increases the likelihood of rejecting the null hypothesis even when it is true, meaning some significant findings may occur by chance (Abdi, 2007). Unlike stricter methods such as Bonferroni, which assume independence, BH is less restrictive, accounts for correlations among test statistics, and improves the ability to detect true effects.

Multiple hypothesis testing is also sensitive to how hypotheses are grouped (Evans et al., 2021). In line with this, we categorized hypotheses under debt status, debt amount, debt type (investment vs. consumption), and debt source (formal vs. informal) to ensure a structured approach to adjustment. Before correction, 28 out of 108 hypotheses yielded significant results; after BH adjustment, 20 remained significant.

Table A8 presents the results before and after adjustment. Debt status retained five significant findings, while debt amount retained two. Investment debt remained significant for NFE in the full sample and hours worked for wages among men. Consumption debt retained significance for hours worked for wages and NFE, particularly among male beneficiaries. Informal debt showed consistent significance for hours worked for wages, with gendered effects on agriculture (men) and part-time work (women). Formal debt continued to drive NFE formation for both men and women.

Conclusion and Policy Implications

This study underscores the critical role of household debt in moderating the labour market effects of LEAP 1000, revealing distinct patterns across debt status, amount, type or purpose, and source. Indebted beneficiaries exhibit higher labour market engagement, with pronounced effects on wage employment, total working hours, and NFE formation. However, these effects are not uniform across gender. Male-headed households respond to debt by increasing both wage work and self-employment, while female-headed households benefit more from formal debt, which facilitates entrepreneurship. The findings also highlight the differentiated impact of debt types, where investment and consumption debt drive entrepreneurial and wage labour responses, while informal borrowing induces immediate labour reallocation. The results reinforce the idea that structured financial mechanisms can enhance the economic potential of cash transfer recipients, but systemic barriers, particularly for women, must be addressed to ensure equitable economic participation.

Given the strong role of debt in shaping labour market decisions, policymakers should prioritize expanding access to structured and affordable formal credit, particularly for women, to support sustainable self-employment and financial stability. Integrating debt-relief mechanisms within cash transfer programs could further ease financial constraints, allowing beneficiaries to redirect labour efforts toward productive ventures rather than debt repayment. Additionally, financial literacy initiatives should accompany social protection programs to help beneficiaries optimize borrowing decisions and labour market participation. Targeted gender-sensitive interventions, such as entrepreneurial training, business grants, and childcare support, could further enable women to leverage debt for long-term economic mobility. By aligning social protection strategies with financial inclusion policies, policymakers can enhance the effectiveness of cash transfers in reducing poverty, fostering economic resilience, and promoting inclusive labour market growth.

Appendix

Table A1: Benjamini and Hochberg Multiple Hypothesis Testing

	Debt Status		Debt Amount		Investment Debt		Consumption Debt		Informal Debt		Formal Debt	
	P-value	BH	P-value	BH	P-value	BH	P-value	BH	P-value	BH	P-value	BH
Hours Worked for Wages	0.004	0.024	0.992	1.000	0.028	0.126	0.011	0.066	0.001	0.018	0.786	0.791
Non-Farm Enterprise	0.000	0.000	0.001	0.018	0.002	0.036	0.007	0.063	0.739	0.894	0.000	0.000
Hours Agric	0.480	0.612	0.523	1.000	0.401	0.481	0.165	0.424	0.138	0.355	0.256	0.379
Hours on Parttime Job	0.544	0.612	0.536	1.000	0.439	0.494	0.697	0.836	0.922	0.922	0.274	0.379
Employment Status	0.285	0.570	0.209	1.000	0.269	0.458	0.414	0.720	0.308	0.579	0.667	0.750
Total Hours Worked	0.007	0.032	0.951	1.000	0.137	0.308	0.379	0.720	0.056	0.168	0.134	0.345
Hours Wages x Male	0.017	0.051	0.470	1.000	0.010	0.060	0.111	0.400	0.002	0.018	0.118	0.345
NFE x Male	0.000	0.000	0.000	0.000	0.009	0.060	0.000	0.000	0.745	0.894	0.000	0.000
Hours Agric x Male	0.506	0.612	0.531	1.000	0.271	0.458	0.058	0.261	0.019	0.086	0.373	0.480
Hours Parttime Job x Male	0.359	0.587	0.480	1.000	0.282	0.458	0.459	0.720	0.614	0.850	0.216	0.379
Employment Status x Male	0.355	0.587	0.219	1.000	0.339	0.469	0.464	0.720	0.379	0.579	0.791	0.791
Total Hours x Male	0.009	0.032	0.835	1.000	0.081	0.208	0.480	0.720	0.031	0.112	0.265	0.379
Hours for Wages x Female	0.662	0.701	0.583	0.900	0.305	0.458	0.555	0.752	0.386	0.579	0.175	0.379
NFE x Female	0.267	0.570	0.261	0.414	0.377	0.481	0.585	0.752	0.796	0.896	0.000	0.000
Hours Agric x Female	0.518	0.612	0.664	1.000	0.064	0.192	0.981	0.981	0.356	0.579	0.038	0.171
Hours Parttime x Female	0.083	0.213	0.253	1.000	0.910	0.910	0.165	0.424	0.017	0.086	0.208	0.379
Emp Status x Female	0.897	0.897	0.885	1.000	0.503	0.533	0.963	0.981	0.858	0.908	0.587	0.704
Total Worked x Female	0.433	0.612	0.685	1.000	0.061	0.192	0.921	0.981	0.188	0.423	0.134	0.345
Total Significance	7	5	2	2	7	3	4	3	4	4	4	3

Notes: BH stands for Benjamini and Hochberg adjusted p-values.

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Statements and Declarations

Author contributions

The authors have made substantial contributions to this research. K.O. conceptualized the study, conducted the literature review, and designed the methodological framework, while D.T. managed data preparation. Both authors performed the empirical estimations and contributed to the discussion and findings. They jointly reviewed and refined the final draft.

Declaration of conflicting interest

The authors report there are no competing financial or non-financial interests to declare.

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Data availability

The LEAP 1000 impact evaluation data are publicly available at [CPC Data Portal](#)

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Appendix

Table OA1: Variable Description

Variable	Question	Description
Hours Worked Wages	“How many hours in the last 7 days did [NAME] do any work for a wage, salary, commission, or any payment in kind, excl. casual labour, for anyone who is not a member of your household?”	Continuous
Non-farm enterprises	“Did you or anyone in your household operate any non-farm enterprises or provide any services (store, transport, home brewing, trade, etc.) in the last 12 months? YES/NO”	Binary
Hours Work Agric	“How many hours in the last 7 days did [NAME] spend in livestock herding, preparing fodder or other livestock activities for the household?” [Livestock farming]. “How many hours in the last 7 days did [NAME] spend collecting nuts or other tree fruits, honey, or other products from forests, either for food consumption, medicine or sales for the household?” [Crop farming]	Continuous
Hours Work Parttime Job	“How many hours in the last 7 days did [NAME] engage in casual, part time or casual labour for anyone who is not a member of your household?”	Continuous
Employment status	Full-employment status	Binary
Total Hours Worked	Hours employment, non-farm enterprises, agricultural labour, part-time job.	Continuous
Debt Status	“Does your household have any outstanding debts to other households or institutions obtained in last 12months (excluding purchases on credit)?”	Categorical
Debt Amount	What is the total amount borrowed? 0-Below average; 1-Above average. NB: average amount is GHC72	Categorical
Consumption Debt	What is the primary purpose of loan? 1 - For meeting day-to-day expenses; For emergency (funeral, medical, etc.); For social reasons such as wedding, travel or bride price. 0 - Otherwise	Categorical

Investment Debt	What is the primary purpose of loan? 1 - To pay off debt; To pay off someone else's debts; For education of self, children, siblings or others.; For renting your family's apartment.; For purchasing or building a house.; Improving your house.; For purchasing land.; For agricultural improvements.; For agricultural implements.; For agricultural inputs e.g. seeds etc.; Expanding your business / buy business stock.; For starting a business; For investing in someone else's business. 0 - Otherwise	Categorical
Formal Loans	What is the primary source of the loan? 1 - State Bank.; Private Bank.; Corporative; Government agency.; NGOs; Business firm; Savings and loans scheme.; Susu scheme.; Trader 0 - Otherwise	Categorical
Informal Loans	What is the primary source of the loan? 1 - Money lender.; Farmer; Relative/Friend/ Neighbor 0 - Otherwise	Categorical
Marital Status	“What is [NAME]s current marital status? 1=Married, monogamous 2=Married, polygamous 3=Consensual Union 4=Separated 5=Divorced 6=Widowed 7=Never Married”	Categorical
Household size	Number of people in household	Continuous
Food insecurity	“In the past four weeks, did you worry that your household would not have enough food?. 1-never,2-Rare,3-sometimes,4-often”	Categorical
Age	How old is [NAME] now?	Continuous
Health Insurance	“Is (NAME) currently registered or covered by health insurance?. 1-Yes,0-No.”	Binary
Household head	“What is [NAMEs] relationship with the head of the household?. 1-Head,0-Other”	Binary

Notes: The table reports the respective questions retrieved from the LEAP 1000 baseline and endline waves.

Table OA2: Debt Status

	(1) Hours Worked for Wages	(2) Non-Farm Enterprise	(3) Hours Worked Agric	(4) Hours Worked on Parttime Job	(5) Employment Status	(6) Total Hours Worked
Panel A: All Household						
Treat x Post	-1.057*** (0.389) [-0.057]	-0.016 (0.019) [-0.016]	0.023 (0.485) [0.002]	0.021 (0.174) [0.003]	-0.026 (0.017) [-0.030]	-1.018** (0.436) [-0.040]
Debt x Post	-1.677 (1.650) [-0.078]	-0.030 (0.023) [-0.025]	0.208 (0.368) [0.013]	0.239 (0.156) [0.027]	-0.097 (0.068) [-0.097]	-1.254 (1.789) [-0.044]
Treat x Post x Debt	2.028*** (0.708) [0.072]	0.118*** (0.026) [0.079]	-0.369 (0.523) [-0.017]	0.349 (0.575) [0.029]	0.051 (0.048) [0.039]	2.031*** (0.755) [0.053]
Observations (N)	4,531	4,531	4,531	4,531	4,531	4,531
No. of Person (n)	2,356	2,356	2,356	2,356	2,356	2,356
Panel B: Male Head Household						
Treat x Post	-1.265*** (0.469) [-0.066]	-0.018 (0.022) [-0.018]	0.007 (0.512) [0.000]	-0.149* (0.077) [-0.020]	-0.028 (0.020) [-0.033]	-1.411*** (0.442) [-0.055]
Debt x Post	-1.608 (1.758) [-0.075]	-0.020 (0.031) [-0.018]	0.127 (0.342) [0.007]	0.103 (0.120) [0.012]	-0.091 (0.071) [0.092]	-1.406 (1.857) [-0.049]
Treat x Post x Debt	2.096** (0.878) [0.074]	0.107*** (0.026) [0.072]	-0.313 (0.471) [-0.015]	0.610 (0.664) [0.055]	0.052 (0.057) [0.040]	2.425*** (0.930) [0.064]
Observations (N)	4,173	4,173	4,173	4,173	4,173	4,173
No. of Person (n)	2,159	2,159	2,159	2,159	2,159	2,159
Panel C: Female Head Household						
Treat x Post	2.011 (1.613) [0.135]	0.009 (0.140) [0.009]	-0.019 (0.617) [-0.002]	1.986*** (0.681) [0.165]	0.011 (0.027) [0.012]	3.978*** (1.231) [0.171]
Debt x Post	-2.089 (2.252) [-0.115]	-0.169 (0.171) [-0.144]	2.044** (1.003) [0.137]	0.957 (0.719) [0.065]	-0.148 (0.151) [-0.143]	0.913 (2.178) [0.031]
Treat x Post x Debt	1.337 (3.056) [0.054]	0.275 (0.248) [0.173]	-1.713 (2.652) [-0.085]	-1.795* (1.036) [-0.090]	0.022 (0.170) [0.016]	-2.171 (2.769) [-0.056]
Observations (N)	358	358	358	358	358	358
No. of Person (n)	197	197	197	197	197	197

Notes: The table reports the triple DDD estimates of the impact of LEAP 1000 on the labour supply of indebted households based on their debt status. Demographic controls include sex, age, household size, marital status, education, and other controls include disability status, health status, health insurance and food insecurity. Robust standard errors in parentheses. We also report the standardized coefficients in the brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table OA3: Amount Debt

	(1) Hours Worked for Wages	(2) Non-Farm Enterprise	(3) Hours Worked Agric	(4) Hours Worked on Parttime Job	(5) Employment Status	(6) Total Hours Worked
Panel A: All Household						
Treat x Post	-0.334 (0.211) [-0.018]	0.003 (0.016) [0.003]	0.018 (0.489) [0.001]	0.003 (0.110) [0.000]	0.003*** (0.030) [0.003]	-0.318 (0.466) [-0.012]
Debt Amount x Post	-0.138 (0.608) [-0.006]	-0.012 (0.033) [-0.009]	0.281 (0.394) [0.015]	0.012 (0.219) [0.001]	-0.036 (0.030) [-0.031]	0.147 (0.679) [0.004]
Treat x Post x Debt Amount	-0.004 (0.369) [-0.000]	0.093*** (0.027) [0.053]	-0.503 (0.787) [-0.020]	0.042 (0.067) [0.041]	-0.043 (0.035) [-0.028]	0.099 (1.617) [0.002]
Observations (N)	4,531	4,531	4,531	4,531	4,531	4,531
No. of Person (n)	2,356	2,356	2,356	2,356	2,356	2,356
Panel B: Male Head Household						
Treat x Post	-0.465 (0.321) [-0.025]	0.001 (0.015) [0.013]	0.055 (0.563) [0.004]	-0.119*** (0.034) [-0.016]	0.001 (0.005) [0.002]	1.149 (1.001) [0.019]
Debt Amount x Post	-0.075 (0.714) [-0.003]	-0.007 (0.042) [-0.005]	0.147 (0.322) [0.008]	-0.006 (0.219) [-0.001]	-0.034 (0.030) [-0.030]	0.040 (0.698) [0.001]
Treat x Post x Debt Amount	0.188 (5.114) [0.002]	0.079*** (0.017) [0.047]	-0.607 (0.968) [-0.025]	0.741 (1.048) [0.058]	-0.042 (0.034) [-0.027]	0.025 (1.678) [0.001]
Observations (N)	4,173	4,173	4,173	4,173	4,173	4,173
No. of Person (n)	2,159	2,159	2,159	2,159	2,159	2,159
Panel C: Female Head Household						
Treat x Post	1.191 (1.422) [0.129]	0.047 (0.133) [0.049]	-0.804 (0.560) [-0.065]	1.766*** (0.468) [0.147]	0.022 (0.019) [0.027]	2.875** (1.429) [0.124]
Debt Amount x Post	-1.746 (1.852) [-0.076]	-0.143 (0.132) [-0.096]	2.852 (2.410) [2.410]	-0.072 (0.814) [-0.004]	-0.116 (0.104) [-0.088]	1.034 (1.273) [0.029]
Treat x Post x Debt Amount	3.093 (5.628) [0.094]	0.302 (0.269) [0.142]	2.009 (4.630) [0.074]	-2.277 (1.994) [-0.085]	-0.038 (0.264) [-0.020]	2.824 (6.972) [0.055]
Observations (N)	358	358	358	358	358	358
No. of Person (n)	197	197	197	197	197	197

Notes: The table reports the triple DDD estimates of the impact of LEAP 1000 on the labour supply of indebted households based on their amount of debt. Demographic controls include sex, age, household size, marital status, education, and other controls include disability status, health status, health insurance and food insecurity. Robust standard errors in parentheses. We also report the standardized coefficients in the brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table OA4: Investment Debt Status

	(1) Hours Worked for Wages	(2) Non-Farm Enterprise	(3) Hours Worked Agric	(4) Hours Worked on Parttime Job	(5) Employment Status	(6) Total Hours Worked
Panel A: All Household						
Treat x Post	-0.550*** (0.151) [-0.029]	0.013 (0.018) [0.013]	-0.247 (0.432) [-0.017]	0.108 (0.268) [0.014]	-0.015 (0.013) [-0.016]	-0.697** (0.339) [-0.027]
Debt Investment x Post	-1.031 (0.988) [-0.030]	-0.100*** (0.034) [-0.055]	-1.547* (0.806) [-0.059]	0.123 (0.340) [0.009]	-0.063 (0.047) [-0.039]	-2.525*** (0.927) [-0.055]
Treat x Post x Debt Investment	1.740** (0.791) [0.037]	0.120*** (0.038) [0.048]	1.137 (1.352) [0.031]	0.384 (0.496) [0.019]	0.046 (0.042) [0.021]	3.347 (2.250) [0.052]
Observations (N)	4,531	4,531	4,531	4,531	4,531	4,531
No. of Person (n)	2,356	2,356	2,356	2,356	2,356	2,356
Panel B: Male Head Household						
Treat x Post	-0.769** (0.313) [-0.040]	0.009 (0.019) [0.009]	-0.304 (0.446) [-0.021]	0.025 (0.256) [0.003]	-0.016 (0.013) [-0.018]	-1.053*** (0.366) [-0.041]
Debt Investment x Post	-1.123 (1.011) [-0.033]	-0.089*** (0.030) [-0.050]	-1.556* (0.850) [-0.060]	0.020 (0.274) [0.001]	-0.063 (0.048) [-0.039]	-2.736*** (1.001) [-0.059]
Treat x Post x Debt Investment	2.044*** (0.791) [0.044]	0.113*** (0.043) [0.046]	1.594 (1.448) [0.045]	0.460 (0.427) [0.025]	0.044 (0.046) [0.020]	4.193* (2.402) [0.066]
Observations (N)	4,173	4,173	4,173	4,173	4,173	4,173
No. of Person (n)	2,159	2,159	2,159	2,159	2,159	2,159
Panel C: Female Head Household						
Treat x Post	2.696 (1.909) [0.182]	0.074 (0.082) [0.077]	-0.213 (0.757) [-0.017]	1.496 (1.023) [0.124]	0.015 (0.066) [0.018]	3.980*** (0.682) [0.171]
Debt Investment x Post	-0.160 (0.972) [-0.005]	-0.315*** (0.119) [-0.148]	-1.238 (2.454) [-0.046]	1.088 (1.230) [0.041]	-0.052 (0.104) [-0.028]	-0.310 (3.752) [-0.006]
Treat x Post x Debt Investment	-2.444 (2.382) [-0.049]	0.227 (0.256) [0.070]	-6.592* (3.563) [-0.161]	-0.166 (1.462) [-0.004]	0.111 (0.165) [0.039]	-9.201* (4.917) [-0.118]
Observations (N)	358	358	358	358	358	358
No. of Person (n)	197	197	197	197	197	197

Notes: The table reports the triple DDD estimates of the impact of LEAP 1000 on the labour supply of indebted households based on their investment debt status. Demographic controls include sex, age, household size, marital status, education, and other controls include disability status, health status, health insurance and food insecurity. Robust standard errors in parentheses. We also report the standardized coefficients in the brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table OA5: Consumer Debt Status

	(1) Hours Worked for Wages	(2) Non-Farm Enterprise	(3) Hours Worked Agric	(4) Hours Worked on Parttime Job	(5) Employment Status	(6) Total Hours Worked
Panel A: All Household						
Treat x Post	-0.695** (0.309) [-0.037]	0.008 (0.020) [0.008]	0.158 (0.425) [0.011]	0.099 (0.190) [0.013]	-0.017* (0.010) [-0.019]	-0.430 (0.326) [-0.017]
Debt Consumption x Post	-1.515 (1.502) [-0.059]	0.023 (0.029) [0.016]	1.210 (0.775) [0.063]	0.237 (0.217) [0.022]	-0.085 (0.062) [-0.072]	-0.056 (2.047) [0.036]
Treat x Post x Debt Consumption	1.540** (0.607) [0.046]	0.076*** (0.028) [0.042]	-1.169 (0.841) [-0.045]	0.205 (0.528) [0.014]	0.037 (0.046) [0.024]	0.554 (0.630) [0.012]
Observations (N)	4,531	4,531	4,531	4,531	4,531	4,531
No. of Person (n)	2,356	2,356	2,356	2,356	2,356	2,356
Panel B: Male Head Household						
Treat x Post	-0.849** (0.372) [-0.045]	0.005 (0.021) [0.005]	0.212 (0.473) [0.036]	-0.041 (0.146) [-0.005]	-0.020* (0.011) [-0.023]	-0.666*** (0.239) [-0.026]
Debt Consumption x Post	-1.374 (1.652) [-0.054]	0.030 (0.044) [0.023]	1.123 (0.701) [0.059]	0.124 (0.252) [0.012]	-0.078 (0.067) [0.066]	-0.116 (2.126) [-0.003]
Treat x Post x Debt Consumption	1.426 (0.894) [0.042]	0.066*** (0.038) [0.037]	-1.371* (0.724) [-0.053]	0.484 (0.654) [0.036]	0.040 (0.054) [0.025]	0.525 (0.742) [0.011]
Observations (N)	4,173	4,173	4,173	4,173	4,173	4,173
No. of Person (n)	2,159	2,159	2,159	2,159	2,159	2,159
Panel C: Female Head Household						
Treat x Post	1.879 (1.659) [0.126]	0.052 (0.159) [0.054]	-0.573 (0.653) [-0.047]	1.876*** (0.585) [0.156]	0.026 (0.026) [0.031]	3.182** (1.549) [0.137]
Debt Consumption x Post	-2.483 (2.538) [-0.119]	-0.046 (0.272) [-0.034]	3.168 (2.471) [0.186]	0.712 (0.435) [0.042]	-0.148 (0.179) [-0.126]	1.398* (0.763) [0.043]
Treat x Post x Debt Consumption	2.627 (4.445) [0.094]	0.201 (0.368) [0.112]	-0.101 (4.268) [-0.004]	-2.007 (1.447) [-0.089]	-0.010 (0.219) [-0.006]	0.519 (5.205) [0.012]
Observations (N)	358	358	358	358	358	358
No. of Person (n)	197	197	197	197	197	197

Notes: The table reports the triple DDD estimates of the impact of LEAP 1000 on the labour supply of indebted households based on their consumption debt status. Demographic controls include sex, age, household size, marital status, education, and other controls include disability status, health status, health insurance and food insecurity. Robust standard errors in parentheses. We also report the standardized coefficients in the brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table OA6: Informal Debt Status

	(1) Hours Worked for Wages	(2) Non-Farm Enterprise	(3) Hours Worked Agric	(4) Hours Worked on Parttime Job	(5) Employment Status	(6) Total Hours Worked
Panel A: All Household						
Treat x Post	-0.974*** (0.374) [-0.052]	0.022 (0.026) [0.022]	0.110 (0.375) [0.109]	0.148 (0.226) [0.018]	-0.022 (0.016) [-0.025]	-0.716* (0.394) [-0.028]
Debt Informal x Post	-2.365* (1.245) [-0.097]	0.053 (0.043) [0.041]	0.600 (0.471) [0.032]	0.042 (0.227) [0.004]	-0.105* (0.054) [-0.091]	-1.719 (1.509) [-0.052]
Treat x Post x Debt Informal	2.496*** (0.733) [0.074]	0.024 (0.071) [0.014]	-0.859 (0.579) [-0.034]	0.031 (0.319) [0.002]	0.048 (0.047) [0.031]	1.675* (0.877) [0.037]
Observations (N)	4,531	4,531	4,531	4,531	4,531	4,531
No. of Person (n)	2,356	2,356	2,356	2,356	2,356	2,356
Panel B: Male Head Household						
Treat x Post	-1.235** (0.502) [-0.065]	0.016 (0.028) [0.016]	0.077 (0.382) [0.005]	0.047 (0.229) [0.006]	-0.025 (0.015) [-0.029]	-1.105*** (0.321) [-0.043]
Debt Informal x Post	-2.325* (1.274) [-0.094]	0.052 (0.056) [0.039]	0.440 (0.425) [0.023]	-0.087 (0.238) [-0.009]	-0.101* (0.055) [-0.089]	-1.967 (1.481) [-0.059]
Treat x Post x Debt Informal	2.810*** (0.902) [0.083]	0.024 (0.074) [0.013]	-0.722** (0.307) [-0.028]	0.143 (0.284) [0.011]	0.055 (0.062) [0.035]	2.238** (1.039) [0.049]
Observations (N)	4,173	4,173	4,173	4,173	4,173	4,173
No. of Person (n)	2,159	2,159	2,159	2,159	2,159	2,159
Panel C: Female Head Household						
Treat x Post	2.800 (2.261) [0.189]	0.079 (0.134) [0.083]	0.220 (0.576) [0.018]	1.622* (0.947) [0.135]	0.029 (0.050) [0.034]	4.643*** (1.606) [0.199]
Debt Informal x Post	-2.177 (2.381) [-0.104]	0.041 (0.195) [0.030]	3.656** (1.713) [0.214]	0.896 (0.578) [0.053]	-0.118 (0.184) [-0.100]	2.375 (2.005) [0.073]
Treat x Post x Debt Informal	-1.307 (1.506) [-0.047]	0.079 (0.305) [0.044]	-3.407 (3.693) [-0.148]	-0.829** (0.347) [-0.037]	-0.025 (0.140) [-0.016]	-5.543 (4.209) [-0.127]
Observations (N)	358	358	358	358	358	358
No. of Person (n)	197	197	197	197	197	197

Notes: The table reports the triple DDD estimates of the impact of LEAP 1000 on the labour supply of indebted households based on their informal debt status. Demographic controls include sex, age, household size, marital status, education, and other controls include disability status, health status, health insurance and food insecurity. Robust standard errors in parentheses. We also report the standardized coefficients in the brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table OA7: Formal Debt Status

	(1) Hours Worked for Wages	(2) Non-Farm Enterprise	(3) Hours Worked Agric	(4) Hours Worked on Parttime Job	(5) Employment Status	(6) Total Hours Worked
Panel A: All Household						
Treat x Post	-0.324* (0.168) [-0.017]	0.002 (0.023) [0.002]	-0.197 (0.416) [-0.014]	0.068 (0.227) [0.009]	-0.012 (0.008) [-0.011]	-0.455* (0.264) [-0.017]
Debt Formal x Post	0.853 (2.762) [0.023]	-0.195*** (0.053) [-0.100]	-0.781 (0.558) [-0.028]	0.557** (0.257) [0.036]	-0.018 (0.099) [-0.011]	0.555 (2.957) [0.011]
Treat x Post x Debt Formal	-0.282 (1.040) [-0.006]	0.253*** (0.052) [0.099]	0.889 (0.782) [0.024]	0.636 (0.582) [0.032]	0.023 (0.053) [0.010]	1.301 (0.868) [0.020]
Observations (N)	4,531	4,531	4,531	4,531	4,531	4,531
No. of Person (n)	2,356	2,356	2,356	2,356	2,356	2,356
Panel B: Male Head Household						
Treat x Post	-0.451* (0.240) [-0.024]	-0.001 (0.022) [-0.001]	-0.181 (0.460) [-0.012]	-0.049 (0.179) [-0.006]	-0.012 (0.012) [-0.014]	-0.680** (0.314) [-0.027]
Debt Formal x Post	0.971 (2.925) [0.026]	-0.167*** (0.064) [-0.087]	-0.653 (0.489) [-0.023]	0.490* (0.268) [0.034]	-0.012 (0.099) [-0.007]	0.719 (3.146) [0.015]
Treat x Post x Debt Formal	-0.735 (1.439) [-0.015]	0.226*** (0.054) [0.090]	0.743 (0.834) [0.020]	0.979 (0.791) [0.052]	0.013 (0.050) [0.006]	1.069 (0.958) [0.017]
Observations (N)	4,173	4,173	4,173	4,173	4,173	4,173
No. of Person (n)	2,159	2,159	2,159	2,159	2,159	2,159
Panel C: Female Head Household						
Treat x Post	1.836 (1.272) [0.124]	0.053 (0.113) [0.055]	-0.861 (0.607) [-0.071]	1.694** (0.777) [0.141]	0.009 (0.036) [0.011]	2.668*** (0.608) [0.115]
Debt Formal x Post	-0.728 (0.937) [-0.022]	-0.495* (0.263) [-0.232]	-2.213** (0.952) [-0.082]	0.640 (0.844) [0.023]	-0.122 (0.127) [-0.065]	-2.301** (1.111) [-0.045]
Treat x Post x Debt Formal	8.388 (6.184) [0.168]	0.492*** (0.134) [0.152]	2.513** (1.214) [0.061]	-3.384 (2.685) [-0.084]	0.131 (0.240) [0.046]	7.517 (5.016) [0.094]
Observations (N)	358	358	358	358	358	358
No. of Person (n)	197	197	197	197	197	197

Notes: The table reports the triple DDD estimates of the impact of LEAP 1000 on the labour supply of indebted households based on their formal debt status. Demographic controls include sex, age, household size, marital status, education, and other controls include disability status, health status, health insurance and food insecurity. Robust standard errors in parentheses. We also report the standardized coefficients in the brackets. *** p<0.01, ** p<0.05, * p<0.1.