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Social Capital and Women's Empowerment in Kenya: Case Study of Murang'a County

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Abstract

One of the pillars that can bring about empowerment is building social capital and social institutions. This study sought to examine the relationship between social capital and women's empowerment in Gikindu, Murang'a County, Kenya. Women's empowerment was measured as an index capturing employment, ownership of enterprises and decision-making. The Social-capital index was measured along three dimensions: groups and networks, trust and solidarity, and collective action and cooperation. A total of 2806 women were sampled. First we estimate a probit and an OLS model. We find a positive and significant relationship between social capital and women's empowerment. Due to potential reverse causality between these two factors, we also estimated a 2SLS and an ivprobit model. The estimates showed a doubling of the marginal effects of social capital after we controlled for endogeneity, suggesting that endogeneity biased downwards the effects of social capital.

Key words: Empowerment, Social capital, Women
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Relevant research subjects: Behavioral & Experimental Economics, Economic of networks, other economics research, economics educator

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I. Introduction

The empowerment of women is essential for pro-poor growth and sustainable development (Organization for Economic Co-operation and Development, 2011). When women are economically empowered, a direct path is opened to poverty eradication, inclusive economic growth, and gender equality. No wonder promoting gender equality and empowerment of women was recognized as one of the Millennium Development Goals and remains one of the UN's Sustainable Development Goals. The concept of women's empowerment gained attention after two landmark conferences: the International Conference on Population and Development in Cairo in 1994 and the Fourth World Conference on Women in Beijing in 1995. Through these conferences, women were acknowledged as independent agents who could bring about change and development, resulting in many theoretical and empirical studies that attempted to understand empowerment, how it could be nurtured, and how it affected the lives of women and their families (Brody et al., 2017)

Women represent one-half of the population and, therefore, enhancing their ability to contribute boosts economic growth at all levels (Hausmann, et al., 2012). When women are empowered in all areas (economically, politically, in education, and in health), they are equipped with knowledge to make informed decisions about their everyday lives and to gain bargaining power. With higher levels of education, women tend to have lower fertility rates, improved nutrition, and increased use of health services for themselves and their children (Vos, 1996). Additionally, the policy-making process is influenced when women are involved in government and have responsibilities for decision-making, planning, and policy recommendations. Furthermore, they are better able to make decisions regarding their sexuality, contraceptive use, childbearing, and childrearing that feed into a broader development agenda.

The term empowerment has been variously defined in the literature. In the view of (Nega et al., 2009)empowerment is, in its broadest sense, the extension of freedom of choices and action. According to (Narayan, 2002), empowerment occurs when the poor have an increase in their assets and capacities that allows them to be involved, to negotiate, to control, to influence, and to put to account the institutions that affect their lives. In the world over, and particularly in developing countries, women are engaged primarily in household management and childcare, which limits their financial independence. Even if they manage to enter the labor market, they still have an extra work burden related to their reproductive role and household chores.

Policy planners have come to recognize that social capital can empower women, allowing them to take on more active roles in household decision-making (e.g., decisions regarding finances

and purchases).There are many definitions of social capital in the sociological and economic literature. Coleman (1988) defined social capital as a structure of relations between and among individuals and conceptualized social capital as consisting of some aspect of social structures that facilitates certain individual actions. Like other forms of capital, social capital is productive, thereby enabling the achievement of specific ends but, unlike other forms of capital, social capital subsists in the structure of relations between and among actors.

Durlauf & Fafchamps (2005), after a review of literature, highlighted three main ideas with regard to social capital. First, social capital enables members to share values, trust, and norms, and this generates positive externalities that affect members' behavior and expectations. Second, through informal organizations formed through social networks and associations, shared values, trust, and norms arise. Third, negative social capital also exists in that not all social interactions are positive or lead to valuable results.

According to (Lin, 1999), the premise behind the notion of social capital is "investment in social relations with expected returns" (30). Individuals engage in interactions and networking in order to produce profits (both monetary and non-monetary). One explanation for why resources invested in social networks produce results is that networks facilitate the flow of information, exercise influence in favor of the individual, and provide acknowledgment and support of uniqueness. Social-group members who share similar interests and resources achieve individuality from being members and have a claim on the resources of the group (Lin, 1999).

The rest of the paper presents the literature review, methodology, results and discussion of results and finally summary and conclusion.

II. Literature Review

Studies over the years have attempted to estimate the factors that affect women's empowerment. Most of these have concentrated on the effect of microfinance on women's empowerment (Garikipati, 2012; Gonzales et al., 2016; Hashemi et al., 1996; Pitt et al., 2006; Rahman et al., 2009). These studies were mainly conducted in Asian countries, especially India and Pakistan. Mixed findings have been reported on the effect of microfinance on women's empowerment: some studies have found that microfinance improves women's economic empowerment (Gonzales et al., 2016; Hashemi

et al., 1996; Pitt et al., 2006), but a few studies have found no significant difference between those who receive credit and those who did not (Garikipati, 2012; Rahman et al., 2009). The Rahman group found that non-borrowers were equally as empowered as the borrowers. Similarly, (Garikipati, 2012) found that microcredit had little impact on women's time use and, hence, on their empowerment.

Other studies (Alcázar et al., 2016) have examined the impact of the Peruvian conditional-cash-transfer program on women's empowerment. They found that women who benefited from the program were empowered in terms of economic decision-making, self-esteem, and perception of life. (Bushra & Wajiha, 2015) also identified education, the economic participation of women, poverty, economic opportunities available to women, and ownership of a bank account to be significant determinants of women's empowerment.

Slowly, studies on women's empowerment have broadened to consider the effect of social capital as well. The building of social institutions and social capital is considered one of the pillars that can directly bring about empowerment (Kanbur et al., 2000). Social capital is also thought to magnify the pay-off of physical- and human-capital investments (Putnam, 1995). Social capital influences economic outcomes such as growth, poverty alleviation, and equity(Grootaert, 1998). This is because associations and institutions set up informal frameworks for organizing the sharing of information, coordinating activities, and engaging in joint decision-making. This is made possible through peer monitoring, a set of norms, and some form of sanctions that bind members. Social capital can therefore be viewed both as a consumption good and as an investment good like human capital (Grootaert, 1998). That is, being a member of a group provides satisfaction, for example, but being a member also allows members to achieve economic milestones.

Some studies estimated the effect of social capital on women's empowerment (Ali et al., 2017; Mayoux, 2001; Nega et al., 2009; Schroeder et al., 2013). In a qualitative case study of New Rice for Africa (NERICA) rice technology in Benin, the Schroeder group found that social networks and collective actions helped empower women by enabling them to have access to additional opportunities to earn income and participate in decision-making. (Mayoux, 2001) also examined the experience of microfinance programs with a focus on formation of social capital and found that microfinance programs that built on and fostered social capital had the potential to empower women. Women's empowerment was measured in terms of increased incomes from economic activities, control over income, and development of collective social activities.

Nega et al. (2009), in a study of Northern Ethiopia, defined empowerment as the power of a household to make decisions that changed the course of its members' lives. Social capital was measured by the number of local associations of which a household was a member. They found that,

while social capital promoted empowerment among households headed by men, it did not among households headed by women. Instead, access to credit and education were the strongest determinants of empowerment among women-headed households. In a study in Bangladesh, (Ali et al., 2017) also found that social networks increased family income and control over income, credit, and savings and spurred participation in income-generation and decision-making.

Studies on relationship between women's empowerment and social capital are very scarce, especially those that have empirically modeled this relationship and used indices of social capital and women's empowerment. The objectives of this paper were:

1. To assess patterns in different dimensions of women's empowerment across population subgroups.
2. To examine the extent of access to government funds and microcredit/microfinance among women across population subgroups.
3. To study the effect of various household characteristics (such as household size) and individual characteristics (education, age, health, and marital status, e.g.) on women's empowerment.
4. To examine the effect of access to government funds and microcredit/microfinance on women's empowerment
5. To analyze the effect of social capital on women's empowerment.

The corresponding research questions and hypotheses are provided in table 1.

Table 1: Research Questions and Hypotheses

	Research Question	**Hypothesis**
1	What are the patterns of different dimensions of women's empowerment across population subgroups such as age, sub-location, etc.	There is variation in the dimensions of women's empowerment across sub-groups.
2	What is the extent of access to government funds and microcredit/microfinance among women across population subgroups	A small proportion of women have had access to government funds and/or microcredit/microfinance and this varies by sub groups.
3	What is the relationship between household characteristics (such as household size) and individual characteristics (such as education, health, marital status) and women's empowerment?	Household and individual characteristics significantly influence women's empowerment.
4	What is the effect of use of the WEF and	Use of the WEF and

	microcredit/microfinance on women's empowerment?	microcredit/microfinance significantly affects women's empowerment.
5	What is the effect of social capital on women's empowerment	Social capital significantly affects women's empowerment.

III. Methodology

3.1. Measurement and Construction of a Women's-Empowerment Index

Malhotra et al. (2002) identified three sets of indicators of empowerment frequently used in literature: domestic decision-making, access to and control over resources, and freedom/mobility indicators. The decision-making indicator captures decision-making regarding family finances, investments, spending, and domestic matters (cooking and welfare of children, e.g., including schooling, health, etc.) Access to and control of resources concern whether a woman has access to and control over household income, assets, and cash. It also captures women's participation in paid employment.

In this study, we used a woman's employment status, asset ownership (house, land, livestock, and household assets), savings, and enterprise ownership as measures of access to and control of resources. Domestic decision-making was measured by whether a woman made decisions regarding her own earnings, major purchases, food cooked, and her own health. Freedom and mobility were measured by whether a woman made decisions regarding visiting her family and/or relatives. All the variables were coded 1 and 0.

To create the women's-empowerment index, we ran a principal component analysis (hereafter, PCA) on the variables above to predict a score. Next, using an xtile command we generated an index that separated the score into ten quantiles. We also generated a binary variable for women's empowerment in which the score was divided into only two quantiles.

3.2. Measurement and Construction of Social-Capital Index

Jones & Woolcock (2007) argued that social capital could be assessed across six dimensions: (i) groups and networks, which considered the extent to which an individual/household participated in various social organizations, informal networks, or activities in the community; (ii) trust and solidarity, which

evaluated how much individuals trusted their neighbors and how their perception of trust changed over time; and (iii) collective action and cooperation, which concerned the community's coming together to work on communal projects. The three remaining dimensions were not included in this study: information and communication, social cohesion and inclusion, and empowerment and political action.

We considered membership in various groups (finance/investment, farm, trade, religious, women's) to depend upon whether a woman had been visited by or visited friends in the preceding three months and whether a woman had gone out with or met a group of friends in the preceding three months. Participation in a community project in the preceding one year was used to measure collective action and cooperation. Trust and solidarity were measured by whether a woman thought her neighbors could be trusted, how often she stopped to talk to people in the neighborhood, whether she had someone to talk to when she was in trouble, and whether she had someone she could confide in.

To construct the social-capital index, we ran a PCA on the variables above, which allowed us to predict a score. Then, using an xtile command, we generated an index that separated the score into ten quantiles. We also generated a binary variable for social capital in which the score was divided into only two quantiles.

3.3. Model Specification

Objectives 1 and 2 were addressed using descriptive statistics. For Objectives 3, 4, and 5, we estimated an OLS regression because the dependent variable was continuous. We also estimated a probit for the binary indicator of women's empowerment. The model can be specified as follows:

$$WE = \alpha_0 + \alpha_1 SI + \alpha_2 WC + \alpha_3 HC + \alpha_4 CC \quad (1)$$

where WE is women's empowerment; SI is social capital; WC is an indicator of women characteristics that included age, education, and marital status; HC is an indicator of household characteristics that included a wealth index and household size; and CC is an indicator of community characteristics (distance to market and sub-location).

There may be reverse causality between social capital and women's empowerment in the

sense that, inasmuch as social capital may lead to women's empowerment, empowered women may have a greater affinity to create social capital. It is possible, for example, that more empowered women appreciate the gains of collective action and can work together in a productive and mutually beneficial way, which, in turn, is likely to add to their stock of social capital. This would bring about a simultaneity bias that would cause an endogeneity problem whereby the error term in Equation 1 could be correlated with the social-capital variable (Wooldridge, 2010). To address the endogeneity problem, we used a two stage least square (2SLS) estimation technique and an ivprobit.

Both approaches require valid instrumental variables that are highly correlated with the social capital variable but not correlated with women empowerment. Previous studies have attempted to instrument social capital, especially those investigating the relationship between self-rated health and social capital, and these have used a number of instrumental variables. Fiorillo and Sabatini (2015) used mass attendance and the average frequency with which people met friends at the community level while (Schultz et al., 2008) used attendance at religious services and residence in community for more than six years as instrumental variables for social capital. The choice of the latter variable was motivated by the finding by (DiPasquale & Glaeser, 1999) that homeowners were more likely to invest in social capital. (Adepoju & Oni, 2012) also used length of residence in the community and membership in religious groups.

We used four instrumental variables measured at the cluster level: the proportion of women who participated in a social project in the preceding one year, the proportion of women who had people they could confide in, the proportion of women who had gone out with or met a group of friends in the preceding three months, and the proportion of women who spent time in internet social activity or other informal social activities in the preceding three months at the cluster level.

The reduced form model for social capital is given as

$$SI = \beta_0 + \beta_1 WC + \beta_2 HC + \beta_3 CC + \beta_4 CC + \beta_5 Z \quad (2)$$

where WC, HC, and CC, are as defined before and Z, is a vector of instrumental variables

We then used 2SLS and ivprobit techniques to estimate Equations 1 and 2 jointly.

3.4. Data and Study Site

The study used CBMS[1] data collected in Gikindu in Murang'a County, one of the five counties in the central region of Kenya. The economic mainstay of Gikindu is agriculture. Most women engage in small-scale crop farming and livestock husbandry, practiced on small family holdings. The main crops are food—namely, maize, beans, potatoes, and cassava. The livestock include indigenous breeds of cattle, goats, and sheep. The area is generally undulating in terms of topography and experiences an annual rainfall of approximately 700 mm and is thus classified as a semi-arid agro-ecological zone. Gikindu has three sub-locations: Mirira, Gikindu, and Kambirwa.

In line with the CBMS approach, we conducted a census on all the households in Gikindu. Data were collected using three sets of questionnaires. The household questionnaire covered basic information about all household members (demography and education, e.g.) and household characteristics (poverty and basic access to services like water and sanitation, housing, and whether a household was headed by a man or a woman, e.g.). One household member (the head of household or any adult member who was able to provide adequate information) was the respondent to the household questionnaire. The addendum to the questionnaire on social capital and women's empowerment covered additional information specific to women and was targeted to women respondents in the household. All women who were either heads of households or the spouses of heads of households were interviewed. Lastly, the community-level questionnaire was designed to complement and provide additional information on such aspects as education facilities, industries, employment programs, and credit institutions in the area. The respondents to the community questionnaire were either sub-chiefs or village elders.

The census covered the February-March 2018 period and included 3,479 households in Gikindu, comprising 9,482 individuals. We focused on 2,806 women aged 18 and above. Thirty-seven percent of these women came from Kambirwa, 37% came from Mirira, and 26% came from Gikindu. Definitions of the variables used in the analysis are provided in table 2 below.

Table 2: Variable Definitions

Variable Name	Definition
Dependent variable	
Women's-Empowerment Index	An index ranging between 1 and 10
Binary women's	A binary variable taking value 1 if woman was empowered and 0

[1] CBMS is a system of collecting data at the local level from all households in a chosen area and seeks to promote evidence-based decision-making by integrating data into the planning and implementation of projects (Reyes et al., 2014)

empowerment variable	otherwise
Key independent variable	
Social-capital index	An index ranging between 1 and 10
Binary social-capital variable	A binary variable taking value 1 if a woman had social capital and 0 otherwise
Independent variables: Women's characteristics	
Age: 18-34 dummy	A binary variable taking value 1 if a woman was aged between 18 and 34, 0 otherwise
Age: 35-64 dummy	A binary variable taking value 1 if a woman was aged between 35 and 64, 0 otherwise
Age 65 or above dummy	A binary variable taking value 1 if a woman was aged 65 or above, 0 otherwise
No formal education dummy	A binary variable taking value 1 if a woman had no formal education, 0 otherwise
Primary education dummy	A binary variable taking value 1 if a woman had a primary education, 0 otherwise
Secondary education dummy	A binary variable taking value 1 if a woman had a secondary education, 0 otherwise
Tertiary education dummy	A binary variable taking value 1 if a woman had a tertiary education, 0 otherwise
Single dummy	A binary variable taking value 1 if a woman was single, 0 otherwise
Married dummy	A binary variable taking value 1 if a woman was married, 0 otherwise
Widowed dummy	A binary variable taking value 1 if a woman was widowed, 0 otherwise
Divorced/separated dummy	A binary variable taking value 1 if a woman was divorced/separated, 0 otherwise
Chronic illness dummy	A binary variable taking value 1 if a woman had a chronic illness, 0 otherwise
Disabled dummy	A binary variable taking value 1 if a woman was disabled, 0 otherwise
Access to credit dummy	A binary variable taking value 1 if a woman had obtained credit, 0 otherwise
Access to government funds dummy	A binary variable taking the value of 1 if a woman had accessed government funds (the Women's Enterprise Fund, the UWEZO Fund, or the Youth Enterprise Development Fund (YEDF) 0 otherwise
Independent variables: Household level variables	
Household size	Number of household members
Wealth index	An index ranging between 1 and 5
Independent variables: Community level variables	
Distance to market	Distance to market in kilometers (km.)
Kambirwa sub-location dummy	Binary variable taking value 1 if the woman came from the Kambirwa sub-location, 0 otherwise
Gikindu sub-location dummy	Binary variable taking value 1 if the woman came from the Gikindu sub-location, 0 otherwise
Mirira sub-location dummy	Binary variable taking value 1 if the woman came from the Mirira sub-location, 0 otherwise

IV. Results

4.1. Descriptive Statistics

The statistics in table 3 show that the average woman's empowerment index was 5.37 and that 48% of women in the sample were empowered. The average social-capital index was 5.41. Approximately 50% of the women had a sufficient stock of social capital. Most of the women were between 35 and 64 and most had a primary education. More than half were married, 14% had some form of chronic illness, and 1% were disabled. Only 2% of the women had received government funds, and 24% had obtained credit from microfinance institutions. The average wealth index was 2.95, and the average household size was three.

The average distance to the market was 4.4 kilometers (minimum = 0 and maximum = 43km).

Table 3: Descriptive Statistics

Variable definition	N	Mean	SD	Min	Max
Dependent variable					
Women's-Empowerment Index	2744	5.37	2.82	1	10
Binary women's empowerment variable	2744	0.48	0.50	0	1
Key independent variable					
Social-capital index	2744	5.41	2.87	1	10
Binary social-capital variable	2744	0.50	0.50	0	1
Independent variables: Women's characteristics					
Age: 18-34 dummy	2806	0.29	0.46	0	1
Age: 35-64 dummy	2806	0.50	0.50	0	1
Age: 65 or above dummy	2806	0.20	0.40	0	1
No formal education dummy	2803	0.31	0.46	0	1
Primary education dummy	2803	0.51	0.50	0	1
Secondary education dummy	2803	0.16	0.36	0	1
Tertiary education dummy	2803	0.03	0.16	0	1
Never married dummy	2806	0.04	0.20	0	1
Married dummy	2806	0.70	0.46	0	1
Widowed dummy	2806	0.20	0.40	0	1
Divorced/separated dummy	2806	0.06	0.23	0	1
Chronic illness dummy	2806	0.14	0.35	0	1
Disabled dummy	2806	0.01	0.12	0	1
Access to credit dummy	2744	0.24	0.43	0	1
Access to government funds dummy	2744	0.02	0.13	0	1
Independent variables: household-level variables					
Household size	2806	3.11	1.45	1	9
Wealth index	2806	2.95	1.42	1	5
Independent variables: community-level variables					

Distance to market	2806	4.41	2.81	0	43
Kambirwa sub-location dummy	2798	0.37	0.48	0	1
Gikindu sub-location dummy	2798	0.26	0.44	0	1
Mirira sub-location dummy	2798	0.37	0.48	0	1

Source: Authors' calculations based on 2018 CBMS Census.

Table 4 provides descriptive statistics of the variables used in the construction of the women's-empowerment index. Only 13% of the women owned enterprises, and 75% were employed. Further, 67% and 42% of the women owned assets and had savings, respectively. Almost all women were involved in decision-making in terms of purchases, earnings, visiting own family/relative, food cooking, and own health.

Table 4: Descriptive statistics Of Variables Used in the Construction of the Women's-Empowerment Index

Dimensions of women's empowerment	N	Mean	SD	Min	Max
1 if owned enterprise	2744	0.13	0.33	0	1
1 if employed	2806	0.75	0.44	0	1
1 if had assets (house, hand, livestock, household items)	2806	0.67	0.47	0	1
1 if had savings	2744	0.42	0.49	0	1
1 if made decision regarding purchases	2744	0.79	0.41	0	1
1 if made decision regarding earnings	2744	0.96	0.20	0	1
1 if made decision regarding visiting own family/relative	2744	0.95	0.23	0	1
1 if made decision regarding food cooked	2744	0.97	0.17	0	1
1 if made decision regarding own health	2744	0.97	0.18	0	1

Source: Authors' calculations based on 2018 CBMS Census.

Table 5 presents the descriptive statistics of the variables used to construct social-capital index. About 38% of the women belonged to women's groups, 13% belonged to finance/investment groups, 10% belonged to religious groups, and only 1% belonged to farm group or trade groups. Thirty one percent of the women had participated in a community project in the past one year. The majority of the women trusted their neighborhoods, had people to talk to when they were in trouble, had people to confide in, and had a network of friends.

Table 5: Descriptive Statistics of Variables Used in the Construction of the Social-Capital Index

Social capital indicators	N	Mean	SD	Min	Max
1 if member of finance/investment group	2744	0.13	0.34	0	1
1 if member of a farm group	2744	0.01	0.10	0	1
1 if a member of a trade group	2744	0.01	0.09	0	1
1 if a member of a religious group	2744	0.10	0.30	0	1
1 if a member of a women group	2744	0.38	0.49	0	1
1 if has participated in a community project	2744	0.31	0.10	0	1
1 if feels people in the neighborhood can be trusted	2744	0.86	0.06	0	1

1 if stops to talk to people in the neighborhood	2744	0.92	0.05	0	1
1 if has someone to talk to when in trouble	2744	0.91	0.29	0	1
1 if has someone to confide in	2744	0.88	0.-06	0	1
1 if visited or was visited by friends in the preceding three months	2744	0.92	0.05	0	1
1 if went out or met group of friends in the preceding three months	2744	0.80	0.08	0	1
1 if spent time on internet social activity in the preceding three months	2744	0.29	0.10	0	1

Source: Authors' calculations based on 2018 CBMS Census.

4.2. Patterns in Dimensions of Women's Empowerment across Population Subgroups

The first objective of this study was to assess patterns in different dimensions of women's empowerment across population subgroups. To achieve this objective, we used descriptive statistics. Table 6 shows the distribution of various dimensions of women's empowerment by age. As the table shows, the mean women's-empowerment index was highest among women aged 65 or over, followed by those 35-64, and was lowest among young women. The same pattern was observed when we considered the women's empowerment binary. Older women were more likely to be empowered than younger ones. Asset ownership also increased with women's age. As expected, women 65 or above were more likely to own assets than those under 65. Women in their middle years were also more likely to be employed. Not much variation was observed between age and decision-making except regarding purchases: older women were more likely to make purchases decisions.

Table 6: Distribution Of Dimensions of Women's Empowerment by Age

Dimension of women's empowerment	Age 18-34 years	Age 35-64	Age 65 and above
Women's-Empowerment Index	4.4	5.4	6.7
Binary variable for women's empowerment	0.3	0.5	0.7
Percentage employed	69.5	84.4	58.3
Percentage with enterprise	14	14.9	6.5
Percentage who own assets	58.2	67.9	78.5
Percentage with savings	44.5	46.5	26.7
Percentage who make decision regarding major purchases	73.1	80	86.3
Percentage who make decisions of use of own earnings	95.8	96.2	95.6
Percentage who make decisions regarding on visits	92.5	95.6	95.3
Percentage who make decisions regarding food	97.8	98	94

to be cooked			

Source: CBMS Census, 2018.

Again, some variations can be observed when women's empowerment dimensions were distributed according to women's highest level of education. Women with no formal education and those with tertiary education both had the same mean women's-empowerment index of 6.03. This may be because women with no formal education were more likely to accept low-level jobs that enabled them to have some savings and assets and participate in decision-making. In terms of the binary indicator, the highest proportion of those empowered was among women with tertiary education. A slightly lower proportion of women with tertiary education were employed compared to those with primary or no formal education. This could be explained by the fact that data show that a good proportion of women worked on their own agricultural holdings. Except for those without formal education, however, educated women were more likely to own enterprises and assets and to have savings.

Table 7: Distribution of Dimensions of Women's Empowerment by Educational Level

Dimension of women's empowerment	No formal education	Primary	Secondary	Tertiary
Women's-Empowerment Index	6.0	5.03	5.1	6.0
Binary women's empowerment	57.9	42.9	43.0	65.8
Percentage employed	70.4	80.3	65.5	68.0
Percentage with enterprise	6.5	13.4	22.2	19.2
Percentage who own assets	72.2	65.1	62.6	76.0
Percentage with savings	26.4	46.1	52.6	72.6
Percentage who make decisions regarding major purchases	81.8	76.8	81.1	86.3
Percentage who make decisions of use of own earnings	95.9	95.8	96.7	97.3
Percentage who make decisions regarding visits	93.7	94.8	96.0	94.5
Percentage who make decisions regarding food to be cooked	95.0	98.2	97.7	97.3

Source: Authors' calculations based on 2018 CBMS Census.

4.3. Access to Government Funds and Microcredit/Microfinance among Women across Population Subgroups

The second objective of this study concerned assessing the extent of access to government funds and microcredit/microfinance among women across population subgroups. We hypothesized that only a small proportion of women had obtained government funds such as the UWEZO Fund, the Youth

Enterprise Fund (hereafter, YEF), the WEF, or microcredit/microfinance. The CBMS data showed that less than 1% of women had accessed any of the government funds, with YEF recording the lowest percentage (close to zero). Most women who accessed the three funds came from the Kambirwa sub-location (table 8). Slightly more of the older women accessed UWEZO or WEF, but a slightly higher proportion of young women accessed YEF, an expected finding given that the fund is targeted to youth (table 9). The fraction of women accessing any of the three government funds increased considerably with level of education. For instance, while only 0.24% of women with no formal education accessed the UWEZO fund, 4.11% of those with tertiary education had done so (table 10).

The CBMS results also showed that about 24% of women had obtained microcredit/microfinance. Older women were slightly more likely to access credit than younger women. This finding may be explained by the fact that older women had more assets that could serve as collateral. There was minimal variation in access to credit by sub-locations. Just as for government funds, the proportion of women who obtained credit increased considerably with level of education. Among those with no formal education, only 13% obtained credit compared to 44% among those with a tertiary education.

Table 8: Distribution of Access to Government Funds and Microcredit/Microfinance by Sub-Location

	All	Kambirwa	Gikindu	Mirira
Access to credit	23.7	24.3	24.8	22.2
Access to the UWEZO fund	0.8	1.8	0	0.4
Access to the YEF fund	0.07	0.2	0	0
Access to the WEF fund	0.95	1.4	0.8	0.6

Source: Authors' calculations based on 2018 CBMS Census.

Table 9: Distribution of Access to Government Funds and Microcredit by Age Groups

	Age 18-34	Age 35-64
Access to credit	22.9	24.1
Access to the UWEZO fund	0.5	0.9
Access to the YEF fund	0.1	0.1
Access to the WEF fund	0.4	1.2

Source: Authors' calculations based on 2018 CBMS Census.

Table 10: Distribution of Access to Government Funds and Microcredit/Microfinance by Educational Level

	No formal education	Primary	Secondary	Tertiary
Access to credit	13.2	25.9	34.1	43.8
Access to the UWEZO fund	0.2	0.4	2.6	4.1
Access to the YEF fund	0	0.07	0.0	1.4
Access to the WEF fund	0.4	0.9	1.6	4.1

Source: Authors' calculations based on 2018 CBMS Census.

4.4. Analysis of the Effects of Social Capital on Women's Empowerment

Objectives 3, 4, and 5 concerned an analysis of the impact on women's empowerment of social capital, access to credit, and household and women's characteristics. Table 11 presents the basic results before we controlled for potential endogeneity of social capital. Both OLS and probit estimates are provided in the table. An OLS model was when women's empowerment was measured as an index. The probit model was used when women's empowerment was measured as a binary variable. In both models, the results showed a positive and significant relationship between social capital and women's empowerment. Probit results showed that social capital increased the probability that a woman was empowered by 1.6 percentage points.

Our results further showed that being married reduced the chance of being empowered, though being a widow increased chances of being empowered relative to women who were never married. Married women were forty-one percentage points less likely to be empowered relative to their never married counterparts, and widowed women were sixteen percentage points more likely to be empowered relative to the never married women. Education, especially tertiary education, increased the chances of a woman's empowerment: women with a tertiary education were eighteen percentage points more likely to be empowered. Similarly, access to government funds and credit increased the chance of women's empowerment: women who accessed microcredit were twelve percentage points more likely to be empowered than those who did not.

We also found that household wealth increased the chance of a woman's empowerment by 1.9 percentage points. Regarding community variables, we found that an increase in distance to the market reduced the likelihood of women's empowerment by 1.3 percentage points. We also found that women in Gikindu and Kambirwa were less likely to be empowered than those in Mirira.

Table 11: The Effect of Social Capital, Access to Credit, and Household Characteristics on Women's Empowerment

	Women's-Empowerment Index	Binary women's empowerment	
	OLS	Probit	
		Coefficient	Marginal effect at mean
Social-capital index	0.0724***	0.0579***	0.0164***
	[0.015]	[0.010]	[0.003]
Age bracket (Base: Age: 18-34)			
Age: 35-64	0.5054***	0.2391***	0.0676***
	[0.099]	[0.065]	[0.018]
Age 65 and above	0.4193**	0.2925**	0.0827**
	[0.164]	[0.115]	[0.032]
Marital status (Base: Never married)			
Married	-3.0840***	-1.4622***	-0.4137***
	[0.211]	[0.141]	[0.038]
Widowed	1.1214***	0.5809***	0.1644***
	[0.229]	[0.164]	[0.046]
Divorced/separated	0.2893	0.2419	0.0684
	[0.259]	[0.184]	[0.052]
Education (Base: No formal education)			
Primary education	0.1492	0.0724	0.0205
	[0.113]	[0.079]	[0.022]
Secondary education	0.1719	0.0343	0.0097
	[0.150]	[0.103]	[0.029]
Tertiary education	0.9988***	0.6467***	0.1830***
	[0.272]	[0.182]	[0.051]
Disabled woman	-1.0514***	-0.1306	-0.037
	[0.357]	[0.244]	[0.069]
Woman has chronic illness	-0.112	-0.1549	-0.0438
	[0.130]	[0.095]	[0.027]
Access to government funds	0.8979***	0.3148	0.0891
	[0.310]	[0.210]	[0.059]
Access to credit	0.7646***	0.4111***	0.1163***
	[0.100]	[0.067]	[0.019]
Household size	-0.0624*	-0.0196	-0.0055
	[0.034]	[0.023]	[0.007]
Wealth Index	0.0807***	0.0655***	0.0185***
	[0.031]	[0.021]	[0.006]
Distance	-0.0435***	-0.0451***	-0.0128***
	[0.015]	[0.011]	[0.003]
Sub-location (Base: Mirira)			
Gikindu	-0.1965*	-0.0371	-0.0105
	[0.106]	[0.072]	[0.020]
Kambirwa	-0.5948***	-0.2759***	-0.0781***
	[0.099]	[0.069]	[0.019]
Constant	6.6552***	0.4439**	
	[0.272]	[0.188]	
Observations	2,735	2,735	
R-squared	0.451		

Standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculations based on 2018 CBMS Census.

As the Table 11 results show, we did not control for potential endogeneity of social capital although, in the methodology section, we indicated a possibility of reverse causality between social

capital and women's empowerment leading to endogeneity. Table 13, Column 4 presents first-stage results. Cluster-level variables were used as instrumental variables for social capital: 1) the proportion of women who participated in a social project in the past one year; 2) the proportion of women who had people they could confide in; 3) the proportion of women who had gone out with or met a group of friends in the preceding three months; and 4) the proportion of women who spent time in internet social activity or other informal social activities in the preceding three months at the cluster level. The results indicate that these instrumental variables were highly correlated with our endogenous variable, social capital. The F (4, 2713) was equal to 22.4963 with a p value of 0.000, allowing us to reject the null hypothesis that the instruments were weak. We also tested for the exogeneity of the instrumental variables. The Sargan and Basmann test resulted in a null hypothesis that the instrumental variables were exogenous (uncorrelated with error term). Table 12 indicates that we did not reject the null hypothesis and, thus, our instrumental variables can be considered exogenous.

Table 12: Test for Exogeneity of Instrumental Variables

Test	value	p value
Sargan (score) $chi^2(3)$	3.6389	0.3032
Basmann $chi^2(3)$	3.61444	0.3062

Source: Authors' calculations based on 2018 CBMS Census.

Table 13 presents the results we obtained once we controlled for potential endogeneity using 2SLS for the women's-empowerment index and ivprobit for the binary women's empowerment variable. The results still show a positive and significant relationship between social capital and women's empowerment. From both the 2SLS and ivprobit results, we noted an increase in the magnitude of the coefficient/marginal effect of social capital on women's empowerment compared to the results in table 11 before we controlled for endogeneity. Social capital increased the chance of women's empowerment by 2.7 percentage points. This value was almost double what was reported in the probit model (1.6 percentage points). Thus, failure to control for endogeneity biased the effect of social capital on women's empowerment in a downward direction.

Table 13: The Effect of Social Capital, Access to Credit, and Women's and Household Characteristics on Women's Empowerment: Potential Endogeneity of Social Capital Controlled

	OLS	Probit: ME	First stage
	1	2	3
Social capital	0.1754**	0.0271*	
	[0.085]	[0.016]	
Age bracket (Base: 18-34)			
Age: 35-64	0.4814***	0.0643***	0.1969
	[0.101]	[0.019]	[0.123]
Age: 65 and above	0.4502***	0.0853***	-0.4144**
	[0.166]	[0.032]	[0.204]
Marital status (Base: Single)			
Married	-3.1909***	-0.4202***	1.0678***
	[0.229]	[0.038]	[0.260]
Widowed	1.0358***	0.1535***	0.8473***
	[0.241]	[0.049]	[0.284]
Divorced/separated	0.2364	0.0624	0.5485*
	[0.264]	[0.052]	[0.321]
Education (Base: No formal education)			
Primary education	0.1025	0.0153	0.4187***
	[0.120]	[0.023]	[0.140]
Secondary education	0.1028	0.0024	0.5999***
	[0.161]	[0.031]	[0.186]
Tertiary education	0.8642***	0.1669***	1.2152***
	[0.295]	[0.056]	[0.336]
Disabled woman	-0.9088**	-0.0215	-1.4085***
	[0.377]	[0.072]	[0.441]
Woman has chronic illness	-0.0891	-0.2157	
	[0.131]	[0.027]	[0.160]
Access to government funds	0.7792**	0.0753	1.0534***
	[0.326]	[0.062]	[0.384]
Access to credit	0.6192***	0.0996***	1.3912***
	[0.155]	[0.031]	[0.121]
Household size	-0.0822**	-0.0076	0.1651***
	[0.038]	[0.007]	[0.042]
Wealth Index	0.0791**	0.0182***	-0.0023
	[0.031]	[0.006]	[0.039]
Distance	-0.0390**	-0.0121***	-0.0449**
	[0.016]	[0.003]	[0.019]
Sub-location (Base: Mirira)			
Gikindu	-0.1644	-0.0068	-0.1571
	[0.109]	[0.021]	[0.139]
Kambirwa	-0.4799***	-0.0648**	-0.7101***
	[0.137]	[0.027]	[0.134]
Instrumental variables			
Proportion of women by cluster who had women they could confide in			2.5208***
			[0.884]
Proportion of women by cluster who participated in community project in the past 1 year			2.8190***
			[0.585]
Proportion of women by cluster who went out or met group of friends in the preceding three months			1.9466***
			[0.707]
Proportion of women by cluster who spent time in internet social activity or other informal social activities in the preceding three months			1.5133**
			[0.633]
Constant	6.2641***		-1.2921
	[0.420]		[1.016]
Observations	2,735	2735	2,735
R-squared	0.441		
Standard errors in brackets		*** p<0.01, ** p<0.05, * p<0.1	

Source: Authors' calculations based on 2018 CBMS Census.

V. Summary, Conclusion, and Policy Recommendations

The first objective of this study was to examine patterns in the various dimensions of women's empowerment across population subgroups. We used descriptive statistics and CBMS data to show that women in the 35-64 age bracket were more likely to be empowered than women 18-34. Except for those without formal education, educated women were more likely to own enterprises and assets and to have savings.

With regards to access to government funds and microcredit/microfinance among women across population subgroups, less than 1% of the women accessed each of the government funds (YEF recorded the lowest percentage: close to zero). The fraction of women accessing any of the three government funds increased considerably with the educational level. We also found that 24% of women accessed microcredit/microfinance. Older women were slightly more likely to access credit than younger women. Access to microcredit also increased significantly with educational attainment.

In terms of examining the relationship between household and individual characteristics and women's empowerment, using a 2SLS estimation procedure, we found that education—especially tertiary education—increased the chance of a woman's being empowered. We also found that married women were less likely to be empowered. Further, household wealth increased the chance of women being empowered. Related to this, the fourth objective of this study was to examine the effect of use of WEF and microcredit/microfinance on women's empowerment. The 2SLS estimation results showed that access to government funds and credit increased the chance of women's empowerment.

Lastly, we also examined the effect of social capital on women's empowerment. We estimated an ivprobit model for the binary women's empowerment variable and a 2SLS for the women's-empowerment index. Our findings showed a positive and significant relationship between social capital and women's empowerment. Women who had social capital were more likely to be empowered.

Table 14 below shows the key findings of the study, corresponding policy implications, and recommendations of the authors.

Table 14: Key Findings, Policy Implication, and Recommendations

Key Findings	Policy Implications	Recommendations
1. Social capital promotes women's empowerment.	Women have a resource that is readily available in the form of social capital that they can use to empower themselves.	— Awareness creation on social capital (what it is and how it can be generated) by the Ministry of Gender and Youth Affairs, Murang'a County.
		— Supporting women to come together to form groups and interact. This can be done in the following ways: — Using women's groups as a form of collateral in government funding such as enterprise funds should be promoted and expanded by Murang'a County. — Target women's groups for government procurement opportunities in Murang'a County. This way, women will have the incentive to come together and work in groups.
2. Access to government funds and microcredit/microfinance promotes women's empowerment.	Promoting access to government funds and to microcredit/microfinance can help promote women's empowerment.	Sensitization and a follow up on government funds by fund managers to ensure that the disbursed funds reach the intended recipients
		Murang'a County government should promote and expand use of women's groups as a source of collateral in issuing government funds
		Women should be encouraged to form SACCOs. Women's saving groups can help them access cheaper credit.
3. Tertiary education promotes women's empowerment.	Tertiary education plays an important role in empowering women.	There is a need for the government to encourage women and remove barriers to their attaining higher-level education and reaching tertiary education.
		The Murang'a County government should allot funds for scholarships and loans for girls to pursue college education. This can go a long way to ensuring that as many girls as possible attain tertiary

		education. Currently the national government offers loans to college and university students. The Murang'a County department of education and technical training should ensure that as many youth as possible are aware of this and are able to apply for loans.
		Sensitizing girls and parents to the importance of educating girl children is equally important. Young women need to be aware and educated regarding postponing or integrating marriage and fertility into studying. This can be done through Murang'a Child Can, a school mentorship initiative aimed at stimulating change in the education sector in Murang'a County. The program involves mentors adopting schools of their choice within the county and working with the school and the County government work to improve performance. Rather than focus on performance, they can also sensitize girls and their parents on the importance of educating girl children.

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