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Measuring Women's Economic Empowerment in the Democratic Republic of Congo, Kenya, Nigeria, and Burkina Faso

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ABSTRACT

There are multiple tools to measure women's economic empowerment but limited information exists about their cross-cultural validity and reliability. This study assesses the psychometric properties of ten questions measuring two dimensions of women's economic empowerment. It uses cross-sectional data from six low-and-middle-income settings: Kinshasa and Kongo Central (Demographic Republic of Congo), Kenya, Lagos and Kano (Nigeria), and Burkina Faso. The first dimension, household decision making, was proxied by women's power to decide household purchases on large items, daily needs, medical treatment, and clothes. This dimension was valid and reliable in all settings. The second dimension, financial autonomy, was proxied by whether women had savings, knew where to obtain financial information, and had financial goals. This dimension was valid and reliable in Kenya, Lagos, and Kano. These findings can inform future surveys aiming to measure women's economic empowerment.

KEYWORDS

Women's empowerment, household bargaining, women, gender, women's economic empowerment

JEL Codes: J16, J12, D13

HIGHLIGHTS

- Given gaps in WEE measurement, this study aims to identify a set of items measuring dimensions of WEE that are consistent and reliable across cultures and over time.
- Specifically, the study seeks to measure women's power in household decision making and financial autonomy that would be consistent across six settings in four African countries.

- By summarizing dimensions of WEE into seven questions, it supports efficiency of current and future population surveys measuring women's empowerment.
- The findings for women's household decision making are consistent across settings suggesting they can be generalized to other, similar contexts.

INTRODUCTION

Women's empowerment and its measurement have received increased attention in recent years. The United Nations introduced the Gender-Related Development Index (GDI) and Gender Empowerment Measure (GEM) to measure the gender dimension of human development. However, unlike the Human Development Index (HDI), these two indicators have been less accepted and criticized due to conceptual problems and data limitations (Klasen and Schüler 2011). One conceptual limitation is combining different dimensions of empowerment into one single index (Klasen 2006). Empowerment has been described as "the exercise of agency" (Upadhyay et al. 2014; Khader 2018). The origins come from conceptualizations proposed by Amartya Sen (1985), who defined agency as the process in which a person gains the ability to live the life they want to live in pursuit of whatever values or goals are important for that individual. Similarly, Naila Kabeer (1999) defines women's empowerment as the process by which a person acquires the ability to make strategic life decisions when those decisions were denied in the past. Together with agency, gaining resources and achieving one's own goals constitute the process of empowerment. Shireen J. Jejeebhoy (2000) defines women's decision-making authority in family decisions, physical autonomy or mobility, and control of resources as interdependent components of women's empowerment.

In this article, we focus on women's economic empowerment (WEE), which is one dimension of women's empowerment and a key component of the fifth goal of the Sustainable Development Goals, to achieve gender equality and empower all women and girls (United Nations 2021). As such, many governments and organizations have invested in women's empowerment, and efforts to economically empower women in low- and middle-income countries (LMIC) have boomed in the past two decades (Dabla-Norris and Kochhar 2019). WEE has become central to gender equality efforts in global health and international development circles.

Economic empowerment is a specific form of empowerment relating to acquiring access to and agency over economic resources and productivity. Sonia Laszlo et al. (2017: 6) define WEE as "the process by which women acquire access to and control over economic resources, opportunities, and markets enabling them to exercise agency and decision-making power

to benefit their lives," with an emphasis on women's ability to reach productivity levels comparable to that of men. Common conceptualizations of broader empowerment that are *not* part of economic empowerment include social networks, reproductive health access, and attitudes to women's rights (Bishop and Bowman 2014). Although we conceptualize empowerment into different independent dimensions, these dimensions can be linked (Gammage, Joshi, and van der Meulen Rodgers 2020). Given the broad scope of the concept of empowerment, as well as its diversity in meaning across contexts, scholars have advised against indices that try to capture empowerment in full (Malhotra and Schuler 2005). As such, we approach measurement through exploring a particular area of empowerment. This study focuses on economic empowerment, as opposed to other forms of empowerment, given the current global call for empowering women economically. The World Economic Forum's annual gender gap reports demonstrate significant progress in recent years towards gender parity in the spaces of health and education but less progress in economic participation (World Economic Forum 2021).

WEE theory

Scholars theorize that economic empowerment has three elements: agency, resources, and achievements of well-being (Kabeer 1999; Buvinic et al. 2020). *Agency* is defined as the ability to set and achieve goals. Typical measures of *agency* in LMICs are women's participation in household decisions, but other measures include the locus of control, self-efficacy to set goals, and the relative autonomy index (Donald et al. 2020). *Resources* regarding the economic sphere of empowerment include current work for pay and access to cash, decision on how to spend own and partner's earnings (if applicable), ownership of a bank account, and mobile phone ownership and usage, among other sources that provide people with economic stability and, ultimately, the ability to act on choice. *Well-being achievements* regarding the economic sphere of empowerment characterize the positive outcomes of the interaction of resources and agency, and include higher education, positive attitudes towards women's mobility and work, and home ownership.

Other work has classified WEE into three groups of measures that relate to agency, resource, and achievements but are more narrowly defined: direct measures, indirect measures, and measures of constraints (Laszlo et al. 2017). Direct measures of WEE are those capturing a woman's direct ability to assert decision-making preferences, aligning with Kabeer's notion of agency and access to resources. Examples of direct measures of WEE include decision making on how to spend money, access to financial information, and ownership of assets or savings. Indirect measures are outcomes of the decision-making process, aligning with Kabeer's

"achievements." Examples of indirect measures are knowledge of labor laws and civic participation. Constraints are factors outside the control of the woman that impact her ability to achieve the outcomes that she desires. Examples of constraints are age of first marriage, power dynamics between the woman and her husband (such as age differences), geographic location/ physical access to services and markets, and women's land ownership laws. Laszlo et al. (2017) generally recommend focusing most on the direct measures of WEE.

Existing measurements of WEE

Given the prominence of WEE in international development, many researchers and practitioners have sought to measure WEE (Kishor and Subaiya 2008; Kabeer, Mahmud, and Tasneem 2011; Kabeer et al. 2013; Hanmer and Klugman 2016; Lombardini, Bowman, and Garwood 2017). The Measuring Women's Economic Empowerment Compendium identified fifteen WEE measurement tools that have been commonly used across settings, designed by fifteen organizations (Buvinic et al. 2020). Common WEE measurement tools are the UN's Measuring Women's Economic Empowerment, the Measuring Women's Economic Empowerment by the Institut Public de Sondage d'Opinion Secteus (Ipsos), the Measuring Women's Economic Empowerment by the Growth and Economic Opportunities for Women (GrOW) from the International Development Research Centre (IDRC), and the Work and Opportunities for Women (WOW) program from the UK's Department for International Development (DFID). Most of these measures were used to monitor and evaluate interventions, with WEE as an outcome variable. The number of indicators used across the fifteen monitoring and evaluation WEE measurement tools identified by The Measuring Women's Economic Empowerment Compendium varied from five to 81, with a total of 164 different indicators across tools. The most common indicators focus on women's labor force participation and household decision-making participation (Fox and Romero 2017).

The International Food Policy Research Institute (IFPRI) has devoted much qualitative work to understanding women's empowerment in three economic activities: agricultural production, agricultural entrepreneurship, and agriculture sector employment. These studies have been conducted across several settings – Bangladesh, Burkina Faso, Ethiopia, Ghana, Kenya, Mali, Nepal, and Tanzania. Similarities across these settings were that empowerment was understood as an *achievement*, and economic status was seen as important because it meant that a woman could take care of herself, her family, and her community (Meinzen-Dick et al. 2019). These studies were inputs to develop a quantitative instrument, the Pro-Women's Empowerment in Agriculture Index (Pro-WEAI).

Across studies, key measures have emerged that are commonly used to capture WEE: household decision making, financial decision-making participation, access to money, financial independence, financial literacy, and indicators of economic positioning (such as employment). Women's participation in the decision to make large household purchases has consistently been used as a proxy for WEE across the literature (Kishor and Subaiya 2008; Akter and Chindarkar 2020). In the early 2000s, the Demographic and Health Surveys (DHS) introduced three questions to measure married women's agency through participation in household decisions (Kishor and Subaiya 2008). These questions were developed by an advisory group following Sunita Kishor's (2000) framework with the aim of measuring women's control, both intrinsic and extrinsic, over various aspects of their lives and environments. Specifically, the survey asks women about their participation in deciding about their own health care, large household purchases, and visits to family and relatives (Croft et al. 2018). The questionnaire was limited to collect empowerment data that is relevant at the household level because the DHS is designed as a household questionnaire. Prior versions of the DHS asked women about daily household purchases, but this question was removed in the mid-2010s.

Sunita Kishor and Lekha Subaiya (2008) analyzed DHS data across multiple countries and found large differences across regions in household decision making: 47 percent of women in Latin America and the Caribbean reported they made decisions about their health care alone, while in Asia and Sub-Saharan Africa, it was 45 and 27 percent, respectively. Lucia Hanmer and Jeni Klugman (2016) studied five domains of women's agency and empowerment, one of them was household decision making in fifty-four countries, proxied by whether a woman had final say on large household purchases. The lack of final say in these purchases was worse in low-income countries (45 percent) than in lower-middle (42 percent) or upper-middle-income (34 percent) countries.

Gaps in WEE measurement

WEE is a complex construct. It is unrealistic to measure WEE with some of the proposed tools as part of regular population surveys that cover multiple topics in LMICs, such as household and health surveys. Such surveys cannot include a large number of questions to measure WEE due to time and cost constraints. To facilitate the measurement of this important concept in the future, we need consensus on how to define, operationalize, measure, and promote WEE across low- and middle-income contexts.

A first step is to increase our knowledge of the psychometric properties (validity and reliability) of commonly used items proxying the

measurement of WEE to evaluate whether the collected data reflects WEE. A limited number of studies have rigorously tested psychometric properties of women's empowerment broadly. Using exploratory factor analysis, Mganga et al. (2021) found a domain of women's decision making in Tanzania, consisting of a set of survey items covering women's participation in health care, purchases, spending of earnings, and visits, reporting an internal consistency of 0.593. Other work using DHS data explored three dimensions of women's empowerment broadly, one of which covered women's participation in household decision making in Ethiopia, Kenya, Rwanda, Tanzania, and Uganda (Miedema et al. 2018). The study found a consistent latent structure in Ethiopia, Kenya, and Rwanda that included women's participation in deciding about spending their own earnings and partner's earnings, accessing health care, purchasing large items, and visiting family and friends. However, this structure did not hold for Uganda and Tanzania, and the internal consistency was not reported. Ibitola Asaolu et al. (2018) implemented a confirmatory factor analysis approach to validate a measure of women's empowerment across Sub-Saharan Africa, identifying attitudes towards violence, labor force participation, education, and access to healthcare as dimensions of broader empowerment. To date and to our knowledge, no such study has done a similar analysis on WEE specifically. Given increased interest in WEE globally, research on the psychometric properties of WEE measures and dimensions is critically needed.

As demonstrated above, while many studies have developed measures for WEE, a validated cross-cultural WEE metric has not been identified (Laszlo et al. 2017; Richardson 2018). Available local measures of WEE are important to understand specific contexts, but when we want to identify local characteristics (such as social institutions and policies and community and household norms) that lead to different levels of WEE, a standardized set of questions can help provide these answers. Hence, having a tool that is comparable across individuals and countries is an important policy goal (Donald et al. 2020). The comparison across time and place of WEE is complicated due to the fact that subjective measures are constantly in flux (Buvinic et al. 2020). Further, many measures of WEE do not consider women's own views on what they believe is empowering in their life. As such, a gold standard of WEE may vary based on cultural context. With these limitations in mind, international bodies recognize the value of a cross-culturally applicable WEE measurement tool. There remains a stark need to develop a direct measure of WEE that is valid and reliable (Buvinic et al. 2020) and experts in the field recommend developing a *comparable cross-regional and time-variant instrument* for cross-country comparisons (Laszlo et al. 2017).

Study contributions

Given the gaps in WEE measurement, we sought to identify a set of items measuring two dimensions of WEE that were consistent and reliable across cultures and over time. Specifically, we investigated whether we could identify a set of items measuring women's power in household decision making and financial autonomy that would be consistent across Kinshasa (Democratic Republic of Congo [DRC]), Kongo Central (DRC), Kenya, Lagos (Nigeria), Kano (Nigeria), and Burkina Faso. We were also interested in finding consistency across women who reported their levels of WEE in 2019 and 2020. For this empirical analysis, we used two rounds of cross-sectional data collected by the Performance Monitoring for Action (PMA) project. As we will show, our analysis proposes a scale to measure women's power in household decision making by asking a woman's participation in purchasing large household items, daily household needs, medical treatment for herself, and clothes for herself.

The scale proposed in this study proved to have cross-cultural and temporal construct validity and reliability across the six studied settings. As such, we believe this scale could be applied in other low- and middle-income contexts, and later construct validity and reliability should be assessed in those new contexts to attest the cross-cultural value of the scale. We also provide evidence of a potential scale for women's financial autonomy through three survey questions that proved to have some cross-cultural and temporal construct validity and reliability, as it was only valid in Kenya, Lagos, and Kano. This scale was based on three questions asking women whether they had savings, knew where to go for financial information or advice, and had financial goals. However, further research is needed to better measure women's financial autonomy. Our main contribution is summarizing WEE into seven questions that can be easily added to current population surveys that are not solely focused on WEE or women's empowerment.

MATERIAL AND METHODS

Data

Data for this study came from the PMA project, which collects longitudinal and cross-sectional data in nine countries across Africa and Asia on key global indicators in family planning and reproductive health from women of reproductive health using standardized questionnaires. The overall direction and support of the PMA project is provided by the Bill and Melinda Gates Institute for Population and Reproductive Health at the Johns Hopkins Bloomberg School of Public Health, and Jhpiego, in collaboration with national partners in each project country. PMA is funded by the Bill and Melinda Gates Foundation.

PMA uses a multi-stage cluster design in which enumeration areas (EAs) were randomly selected to measure the modern contraceptive prevalence rate with a 3 percent margin of error. After selection, households in each EA were listed and mapped. A sample of approximately thirty-five households in each EA was then randomly selected and embedded in each household survey was the woman respondent. More information about the design of PMA surveys is available online (https://www.pmadata.org) and in the PMA Survey Protocol (PMA 2019).

For this secondary data analysis, we used two rounds of cross-sectional data collected by the PMA project between 2019 and 2021 in two areas from the Demographic Republic of Congo (Kinshasa and Kongo Central), Kenya, two states in Nigeria (Lagos and Kano), and Burkina Faso. We analyze the data across multiple settings to assess the cross-cultural validity. We choose to analyze two separate rounds of data to assess the temporal validity of our scale. We denote the first survey as Phase 1, and the second survey as Phase 2, which were collected one year apart. One could argue that much change cannot occur within a year; however, in each setting, the first sample was collected prior to the COVID-19 pandemic, and we know the pandemic disrupted the economy of these countries (Gummerson et al. 2021). The dates when these data were collected are presented in the Supplemental Online Appendix, Table A1.

Our study included only women of reproductive age (15–49 years) who, at the time of the interview, reported they were either married or living with a partner, denoting them as in union. We restricted our sample to women in union because one of the WEE dimensions we measured in this study is women's household bargaining power in household decision making. In order to bargain, a woman needs to be living with someone with whom she can bargain, which we defined as a partner for the purposes of this analysis.

The study uses de-identified publicly available secondary data of PMA. Data collection protocols by the PMA project were reviewed and approved by the institutional review board of the Johns Hopkins Bloomberg School of Public Health, and the in-country counterpart institutional review boards. For more information, see the ethical approval section on the PMA website (https://www.pmadata.org/data/about-data).

Measures

The PMA questionnaire for women included information about the respondent's background, marital status, employment, and migration, along with two sets of questions (or items) proxying two dimensions of WEE: (i) Women's power in household decision making; and (ii) Women's financial autonomy. The questions proxying these two dimensions of WEE were based on prior studies that have investigated the operationalization of women's empowerment (see, for example, a summary in Upadhyay et al.

2014 and cross-country comparisons in Kishor and Subaiya 2008). The same questions were asked in both survey questionnaires. A detailed description of these questions is presented in Table 2.

All in union women were asked about their role in making household decisions about the following items: (1) large household purchases; (2) daily needs purchases; (3) medical treatment for herself; (4) clothes purchases for herself; and (5) spending of her partner's earnings. Specifically, these questions were framed as "*Who usually makes decisions about making [item] purchases*?" A woman could indicate she was the sole decision-maker, her husband or partner was the sole-decision maker, both make decisions together, someone else was the decision maker,[1] or refuse to respond. These questions are similar to those available in the DHS and are aligned with the definition of direct measures proposed by Laszlo et al. (2017), given that they directly capture women's bargaining power. Few women refused to respond, less than 0.7 percent across the study settings. Each question was transformed into a binary form, taking the value of one if a woman was the sole decision-maker or made decisions jointly with her husband or partner, and zero if her husband or partner was the sole decision-maker or someone else. To assess the sensitivity of these variables, we implemented an alternate definition categorizing a woman as having "no control" if someone else or her partner were the decision makers, she was "somewhat in control" if she and her partner made decisions together, and she was in "full control" if she made the decisions by herself.

To proxy women's financial autonomy, women were asked a set of five questions capturing women's savings capacity, ownership of a mobile money account, financial management, financial knowledge, and financial goals. This dimension captures the resource component that is part of the theorized definition of economic empowerment (Kabeer 1999; Buvinic et al. 2020). Specifically, women were asked the following questions: (1) "*Do you currently have any savings for the future, such as a bank account, savings group, or cash?*"; (2) "*Do you currently have any mobile money accounts*?" (for example, Mpesa, Orange Money, MobiCash, Coris Money); (3) "*When it comes to managing your money and financial matters, what is your level of knowledge?*[2] "; (4) "*Do you know where to go for financial information or advice?*"; and (5) "*Do you have financial goals toward which you are working?*" Similar to women's power in household decision making, these questions were used in a binary form, taking the value of one if a woman provided a positive answer and zero otherwise.

We also looked at the socioeconomic and demographic composition of the analytical samples. The characteristics we included were age (15–24, 25–34, 35–49), education (none/primary, post-primary/secondary, and tertiary/college), place of residence (urban, rural), wealth quintiles constructed from an asset score, numbers of members living in the

household (1–3, 4–6, 7+), and parity (or number of children; 0–1, 2-3, 4+).

Statistical approach

Descriptive analysis

We started our analysis by computing summary statistics of the socioeconomic and demographic characteristics of the sample recorded at each survey phase. We also computed the proportion of women who provided a positive response to each of the items measured in the PMA questionnaire proxying the two dimensions of WEE: (i) women's power in household decision making and (ii) women's financial autonomy.

Scale performance

WEE is a difficult construct to measure, and measuring through only one question might be problematic, which is why we propose a set of questions to construct a scale that reflects WEE. A scale that measures a construct is also known as a latent variable. Reliability and validity are psychometric properties implemented to evaluate whether the collected data reflects the construct of interest (DeVellis and Thorpe 2021).

Reliability assesses the consistent performance of an instrument. For this study, we assess the reliability of our scale by measuring the internal consistency to assess the degree of homogeneity of items within a scale because items should be correlated with each other and the total score. First, we examined inter-item correlations, which examine the extent to which scores on one item are related to scores on all other items in a scale, by computing tetrachoric correlation coefficients; we chose to compute tetrachoric correlation coefficients instead of Pearson's correlation coefficients because the items were binary variables. Three items recorded low correlation (below $\rho = 0.3$) and we decided to delete them. These items were spending partner's earnings, mobile money account, and financial management. Hence, we used seven items for the final analysis. Second, to assess the scale reliability (internal consistency) of the kept items, we computed Kuder-Richardson-20 (KR-20) coefficient,[3] which is recommended for internal consistency reliability analysis of binary data. A KR-20 coefficient above 0.60 signals an adequate reliability coefficient (DeVellis 2012).

Validity is the extent to which the scale measures what it purports to measure. For this study, we assess internal construct validity, the extent to which underlying variables (of latent variables) reflect theoretical constructs. We conducted confirmatory factor analysis (CFA) to assess internal construct validity. First, we conducted a principal component

analysis (PCA) to determine the number of common factors to extract for the CFA based on the following criteria: the "bend" in the scree plot of eigenvalues,[4] Kaiser's rule of retaining eigenvalues above one, and parallel analysis tests with 1,000 iterations. Then, we performed CFA using the number of factors recommended by the PCA. We implemented an oblique rotation on our CFA to improve the interpretability of the results. We considered a threshold of 0.50 (absolute value) in the factor loadings to categorize items across the two dimensions of WEE, an inter-item tetrachoric correlation above 0.30 (absolute value), and a consistent factor structure across countries and survey phases to signal cross-cultural construct validity.

Scale measurement

Finally, once we identified the items loading on each dimension, we computed the scale as the sum of the items belonging to a dimension. Our WEE scale ranged from 0 to 4 for the first dimension, and from 0 to 3 in the second dimension. All analyses were performed separately for each setting and weighted to account for the complex survey design.

RESULTS

Our analytical samples consisted of 13,967 and 13,421 women of reproductive age (15–49 years) in union who participated in Phases 1 and 2 surveys, respectively. In Phase 1, we had 1,158 women from Kinshasa, 1,173 from Kongo Central, 5,589 from Kenya, 866 from Lagos, 820 from Kano, and 4,361 from Burkina Faso. The distribution of women across settings in Phase 2 was similar to Phase 1 (Online Appendix, Table A2).

Table 1 presents socioeconomic and demographic characteristics of the women included in our study. All women from Kinshasa, Kongo Central, and Lagos lived in an urban area. In phases 1 and 2, around one-third of women from Kenya and Kano, and close to 20 percent in Burkina Faso, lived in an urban area. The distribution across age and education was similar between the survey phases. In Lagos, less than five percent of the women were between 15 and 24 years old, while in Burkina Faso, Kano, and Kongo Central, close to one-quarter of the women were between 15 and 24 years old. Burkina Faso, Kano, Kenya, and Kongo Central grouped a large proportion of women with either no education or attended only the primary level – above 85, 75, 55, and 45 percent, respectively. Between phases, all settings experienced changes in the distribution of children born to the interviewed women, which also translated to changes in the distribution of members in the household (Table 1).

The proportion of women who reported a positive response indicative of empowerment to the items included in the household decision making

Table 1 Sample characteristics, by setting and survey phase

	DRC, Kinshasa		*DRC, Kongo Central*		*Kenya*		*Nigeria, Lagos*		*Nigeria, Kano*		*Burkina Faso*	
Characteristics	*Phase 1 (Obs. = 1,158)*	*Phase 2 (Obs. = 1,041)*	*Phase 1 (Obs. = 1,173)*	*Phase 2 (Obs. = 1,107)*	*Phase 1 (Obs. = 5,589)*	*Phase 2 (Obs. = 5,356)*	*Phase 1 (Obs. = 866)*	*Phase 2 (Obs. = 850)*	*Phase 1 (Obs. = 820)*	*Phase 2 (Obs. = 816)*	*Phase 1 (Obs. = 4,361)*	*Phase 2 (Obs. = 4,253)*
Age categories												
15–24	0.132	0.122	0.201	0.218	0.169	0.191	0.051	0.047	0.258	0.274	0.259	0.255
25–34	0.396	0.411	0.378	0.379	0.429	0.430	0.376	0.406	0.410	0.398	0.371	0.374
35–49	0.472	0.467	0.421	0.403	0.402	0.379	0.573	0.547	0.332	0.328	0.369	0.371
Education												
None/Primary	0.104	0.115	0.472	0.473	0.575	0.575	0.148	0.149	0.774	0.782	0.872	0.881
Post-Primary/Secondary	0.721	0.722	0.510	0.509	0.294	0.299	0.462	0.458	0.187	0.181	0.117	0.110
Tertiary/College	0.175	0.163	0.018	0.018	0.131	0.127	0.391	0.393	0.039	0.037	0.011	0.009
Urban	1.000	1.000	1.000	1.000	0.292	0.288	1.000	1.000	0.315	0.300	0.172	0.173
Wealth quintile[a]												
1. Lowest quintile	0.190	0.180	0.208	0.191	0.206	0.219	0.157	0.153	0.216	0.213	0.219	0.362
2. Lower quintile	0.199	0.178	0.207	0.206	0.236	0.232	0.182	0.200	0.198	0.196	0.218	0.353
3. Middle quintile	0.190	0.199	0.211	0.220	0.205	0.209	0.198	0.193	0.215	0.200	0.201	0.285
4. Higher quintile	0.197	0.214	0.196	0.189	0.183	0.175	0.216	0.218	0.189	0.208	0.206	
5. Highest quintile	0.224	0.229	0.177	0.193	0.170	0.165	0.246	0.237	0.182	0.183	0.156	
Members in the household												
1–3	0.148	0.172	0.147	0.162	0.182	0.231	0.198	0.209	0.092	0.131	0.122	0.147
4–6	0.496	0.510	0.524	0.547	0.565	0.539	0.677	0.692	0.338	0.298	0.341	0.332
7 +	0.356	0.317	0.329	0.291	0.252	0.230	0.124	0.100	0.570	0.571	0.536	0.521
Parity												
0–1	0.214	0.232	0.180	0.222	0.194	0.212	0.219	0.226	0.143	0.196	0.197	0.206
2–3	0.397	0.394	0.329	0.310	0.385	0.393	0.511	0.489	0.247	0.205	0.286	0.295
4 +	0.389	0.375	0.492	0.468	0.421	0.394	0.270	0.285	0.610	0.599	0.517	0.499

Notes: [a]The wealth asset score was divided into tertiles instead of quintiles in Burkina Faso Phase 2: the lowest tertile is in row 1, middle tertile is in row 2, and highest tertile is in row 3 of the wealth measures category.

Table 2 Description of women's economic empowerment items

Dimension and items	*Question*	*Item scoring coding*	*Reason for deletion*
D1: Household decision making (4 items)			
Large purchases	Who usually makes decisions about making large household purchases: you, your husband/partner, you and your husband/partner jointly, or someone else?	0 = Partner/ Someone else, 1 = Women/Women and partner	
Daily purchases	Who usually makes decisions about making household purchases for daily needs: you, your husband/partner, you and your husband/partner jointly, or someone else?	0 = Partner/ Someone else, 1 = Women/Women and partner	
Medical purchases	Who usually makes decisions about getting medical treatment for yourself: you, your husband/ partner, you and your husband/ partner jointly, or someone else?	0 = Partner/ Someone else, 1 = Women/Women and partner	
Clothes purchases	Who usually makes decisions about buying clothes for yourself: you, your husband/ partner, you and your husband/ partner jointly, or someone else?	0 = Partner/ Someone else, 1 = Women/Women and partner	

(*Continued*).

Table 2 Continued

Dimension and items	*Question*	*Item scoring coding*	*Reason for deletion*
D2: Financial autonomy (3 items)			
Savings	Do you currently have any savings for the future, such as a bank account, savings group, or cash?	0 = No, 1 = Yes	
Financial information	Do you know where to go for financial information or advice?	0 = No, 1 = Yes	
Financial goals	Do you have financial goals toward which you are working?	0 = No, 1 = Yes	
Deleted items (3 items)			
Spending partner's earnings	Who usually makes decisions about how your husband/partner's earnings will be used: you, your husband/partner, you and your husband/partner jointly, or someone else?	0 = Partner/ Someone else, 1 = Women/Women and partner	Low correlation, low factor loading
Mobile money account	Do you currently have any mobile money accounts (for example, Mpesa[a])?	0 = No, 1 = Yes	Low correlation, low factor loading
Financial management	When it comes to managing your money and financial matters, what is your level of knowledge?	0 = Not at all/ Not very, 1 = Somewhat/ very	Low correlation, low factor loading

Notes: [a]Mpesa, Orange Money, and Airtel-Money were the examples used in DRC; Mpesa and M-Shwari for Kenya; Firstmonie, Diamond yello account, and OPay for Nigeria, and Orange Money, MobiCash, and Coris Money for Burkina Faso.

and financial autonomy scales are shown in Table 3. The difference in the proportion of women who provided a positive response to the items proxying women's power in household decision making between phases 1 and 2 was less than 5 percentage points within settings, except for daily purchases in Kano (5.3 percentage points) and Kong Central (6.7 percentage points), and medical purchases in Kano (6.2 percentage points). More than half of the women from Kinshasa, Kenya, Lagos, and Kongo Central reported they participated in the decision to purchase large household items: 72.8, 72.4, 70.4, and 52.0 percent in the Phase 2 survey, respectively. Contrary, only around a third of the women in Kano (32.3 percent in Phase 2) and Burkina Faso (36.0 percent in Phase 2) participated in such a decision. Across all settings, more than two-thirds of the women participated in the decision making of daily purchases, except in Kano. A similar pattern was observed in the decision to buy clothes for herself. As for medical purchases, there were three types of settings: (i) high participation rates, above 70 pecent, in Kenya and Lagos, (ii) medium participation rates, around 50 percent, in Kinshasa, and (iii) low participation rates, around 30 percent, in Kongo Central, Burkina Faso, and Kano.

A low proportion of women reported having savings or knowing where to obtain financial information or advice in Kongo Central, Kinshasa, and Burkina Faso. For example, in Kongo Central, only 11.9 and 12.9 percent of the women who participated in the Phase 1 survey reported having savings and knowing where to obtain financial information, respectively. Kenya and Lagos recorded higher proportions than all other settings. Kano experienced a 19.7 percentage point increase in the proportion of women who knew where to obtain financial information between 2019 and 2020 – or Phase 1 and 2. Table 3 also shows descriptive statistics for the three items that were dropped from the WEE scales.

Based on inter-item tetrachoric correlations and the exploratory data analysis, all items in the women's power in household decision-making dimension were retained, as were three of the initial five items in the financial autonomy dimension. The eigenvalues that resulted from the PCA (Online Appendix, Table A3) and the eigenvalues from the parallel analysis test (Online Appendix, Figures A1 and A2) indicated we should retain two factors for the CFA. These findings were consistent across settings.

Table 4 shows the results from the CFA and reliability measures of the WEE scales by country and survey-phase. Large purchases, daily purchases, medical purchases, and clothes purchases consistently loaded in the first dimension representing women's power in household decision making (eigenvalues $> |0.5|$). Savings, financial information, and financial goals consistently loaded in the second dimension representing financial autonomy (eigenvalues $> |0.5|$). The pattern displayed in the pattern matrix of eigenvalues was consistent across settings and across survey-phases, providing evidence of cross-cultural and temporal construct validity

Table 3 Proportion of women who reported a positive response to the items included in household decision-making and financial autonomy, by setting and survey phase

	DRC, Kinshasa		*DRC, Kongo Central*		*Kenya*		*Nigeria, Lagos*		*Nigeria, Kano*		*Burkina Faso*	
Items	*Phase 1 (Obs. = 1,158)*	*Phase 2 (Obs. = 1,041)*	*Phase 1 (Obs. = 1,173)*	*Phase 2 (Obs. = 1,107)*	*Phase 1 (Obs. = 5,589)*	*Phase 2 (Obs. = 5,356)*	*Phase 1 (Obs. = 866)*	*Phase 2 (Obs. = 850)*	*Phase 1 (Obs. = 820)*	*Phase 2 (Obs. = 816)*	*Phase 1 (Obs. = 4,361)*	*Phase 2 (Obs. = 4,253)*
D1: Household decision making (4 items)												
Large purchases	0.733	0.728	0.498	0.520	0.692	0.724	0.674	0.704	0.292	0.323	0.352	0.360
Daily purchases	0.863	0.842	0.738	0.671	0.793	0.825	0.839	0.873	0.416	0.468	0.698	0.685
Medical purchases	0.536	0.572	0.367	0.348	0.710	0.754	0.734	0.749	0.293	0.355	0.353	0.331
Clothes purchases	0.797	0.822	0.633	0.651	0.822	0.846	0.880	0.901	0.382	0.413	0.776	0.740
D2: Financial autonomy (3 items)												
Savings	0.274	0.280	0.119	0.095	0.451	0.480	0.685	0.723	0.320	0.363	0.112	0.142
Financial information	0.176	0.194	0.129	0.110	0.486	0.519	0.557	0.588	0.435	0.632	0.210	0.208
Financial goals	0.768	0.849	0.340	0.312	0.769	0.809	0.750	0.805	0.797	0.869	0.715	0.730
Deleted items (3 items)												
Spending partner's earnings	0.710	0.693	0.494	0.517	0.523	0.551	0.374	0.377	0.163	0.160	0.261	0.210
Mobile money account	0.329	0.345	0.169	0.137	0.686	0.767	0.170	0.148	0.050	0.059	0.165	0.227
Financial management	0.858	0.736	0.704	0.438	0.753	0.781	0.796	0.881	0.712	0.706	0.442	0.085

and the bi-dimensionality of the WEE scale, two important elements of construct validity.

The KR-20 coefficient of internal consistency is also shown in Table 4. The women's power in household decision-making scale showed adequate internal consistency in Kinshasa, Kongo Central, Kenya, Kano, and Burkina Faso (KR-20 coefficient > 0.6) in both survey-phases. Lagos showed an adequate internal consistency in Phase 1 (KR-20 coefficient = 0.67), and it was at the threshold of acceptance in Phase 2 (KR-20 coefficient = 0.60). These findings indicate good internal consistency of the women's power in household decision-making scale in all six settings.

In the financial autonomy scale, the KR-20 coefficient of internal consistency did not achieve an adequate level in any of the settings. However, in Phase 1, Kenya, Lagos, and Kano were not too far away from an acceptable threshold of 0.60 – KR-20 coefficient was 0.59, 0.55, and 0.54, respectively – and Kenya in Phase 2 – KR-20 coefficient = 0.58. In addition, Kenya, Lagos, and Kano recorded high inter-item correlations. Correlations ranged between 0.49–0.58 in Phase 1 and 0.50–0.61 in Phase 2 in Kenya, 0.42–0.54 in Phase 1 in Lagos, and 0.49–0.64 in Phase 1 and 0.33-0.59 in Phase 2 in Kano (Online Appendix, Table A4). Hence, these correlations indicate an acceptable internal consistency of the financial autonomy scale in Kenya, Lagos, and Kano, but not in Burkina Faso, Kinshasa, and Kongo Central.

Low Spearman-rank correlations were noted between the two WEE dimensions in the six settings and all survey-phases (all correlations were < 0.30, range: -0.011–0.194; Online Appendix, Table A6). This finding supports the theoretical approach of developing separate scales to assess two dimensions of WEE (power in household decision making and financial autonomy); they also provide evidence of construct validity of two measures rather than a single composite measure.

Once we identified the items loading on each dimension, we computed the scale for each setting and survey-phase (Figure 1). The level of women's power in household decision making was different across settings, but it was similar across phases within each setting. Women in Kenya, Lagos, and Kinshasa reported the highest levels: 61, 55, and 50 percent respectively, reported in 2020 that they participated in the decision making of all four household decision-making items. This proportion was similar between women in Kongo Central and Burkina Faso in 2020, 26 and 19 percent, respectively. Women from Kano recorded the lowest levels of empowerment in household decision making: 43 and 46 percent reported they did not participate in the decision making of any of the items in 2019 and 2020, respectively. We computed the financial autonomy scale for Kenya, Lagos, and Kano, but not in Burkina Faso, Kinshasa, and Kongo Central due to low internal consistency in these places, as reported above. Between 2019 and 2020, there was a five-percentage point increase in the

Table 4 Oblique rotated factor loadings, results from confirmatory factor analysis of women's economics empowerment scale, by setting and survey phase

	DRC, Kinshasa		*DRC, Kongo Central*		*Kenya*		*Nigeria, Lagos*		*Nigeria, Kano*		*Burkina Faso*	
Phase 1												
D1: Household decision making (4 items)												
Large purchases	**0.707**	0.036	**0.615**	− 0.002	**0.720**	0.032	**0.720**	0.078	**0.724**	0.054	**0.682**	− 0.157
Daily purchases	**0.694**	− 0.119	**0.734**	− 0.068	**0.776**	0.025	**0.754**	0.004	**0.793**	− 0.001	**0.736**	− 0.031
Medical purchases	**0.690**	0.122	**0.666**	0.123	**0.799**	− 0.046	**0.729**	− 0.087	**0.829**	− 0.014	**0.695**	0.042
Clothes purchases	**0.723**	− 0.005	**0.713**	− 0.053	**0.763**	− 0.005	**0.647**	0.015	**0.810**	− 0.028	**0.669**	0.127
Internal consistency (KR-20 coeff.)	**0.66**		**0.62**		**0.76**		**0.67**		**0.80**		**0.64**	
D2: Financial autonomy (3 items)												
Savings	0.055	**0.781**	− 0.026	**0.579**	− 0.019	**0.747**	0.052	**0.752**	− 0.014	**0.736**	0.093	0.474
Financial information	− 0.021	**0.675**	− 0.074	**0.783**	0.021	**0.730**	− 0.052	**0.693**	0.027	**0.721**	0.010	**0.711**
Financial goals	− 0.043	**0.590**	0.084	**0.698**	− 0.006	**0.750**	− 0.009	**0.727**	− 0.021	**0.709**	− 0.069	**0.670**
Internal consistency (KR-20 coeff.)	0.45		0.44		0.59		0.55		0.54		0.25	
Phase 2												
D1: Household decision making (4 items)												
Large purchases	**0.731**	0.034	**0.746**	0.063	**0.755**	− 0.031	**0.679**	− 0.081	**0.843**	− 0.028	**0.610**	0.102
Daily purchases	**0.747**	− 0.109	**0.770**	0.082	**0.801**	0.020	**0.695**	− 0.118	**0.854**	0.075	**0.738**	− 0.093
Medical purchases	**0.715**	0.107	**0.730**	− 0.134	**0.808**	− 0.007	**0.661**	0.144	**0.891**	− 0.054	**0.720**	0.079
Clothes purchases	**0.724**	− 0.077	**0.711**	− 0.011	**0.780**	0.015	**0.682**	0.043	**0.869**	− 0.014	**0.722**	− 0.060
Internal consistency (KR-20 coeff.)	**0.70**		**0.72**		**0.79**		**0.60**		**0.89**		**0.65**	
D2: Financial autonomy (3 items)												
Savings	− 0.086	**0.725**	0.011	**0.560**	− 0.020	**0.758**	0.028	**0.737**	0.166	**0.612**	− 0.014	**0.575**
Financial information	0.006	**0.714**	− 0.038	**0.701**	0.061	**0.718**	0.106	**0.583**	− 0.107	**0.678**	0.005	**0.669**
Financial goals	0.145	0.446	0.049	**0.721**	− 0.033	**0.742**	− 0.115	**0.721**	− 0.039	**0.727**	− 0.018	**0.659**
Internal consistency (KR-20 coeff.)	0.30		0.37		0.58		0.44		0.38		0.28	

Notes: We implemented an oblique rotation to improve the fit between items and factors. Eigenvalues above 0.5 are bolded, which is the recommended threshold for factor analysis. KR-20 coeff. = Kuder-Richardson-20 coefficient. KR-20 coefficients above 0.6 are bolded and indicate adequate internal consistency.

proportion of women who reported having savings, knew where to obtain financial information, and had financial goals in Kenya and Kano, from 29 percent to 34 and 20 percent to 25 percent, respectively. In Lagos, there were no major changes between 2019 and 2020. In 2020, 43 percent of women responded positively to all three items and only 6 percent provided a negative response.

DISCUSSION

In this study, we sought to develop a scale to measure women's economic empowerment by assessing the cross-cultural and temporal consistency and reliability of ten questions proxying this construct. To do so, we used data collected in 2019 and 2020 from women of reproductive age living in urban and rural areas of Kenya, Burkina Faso, and Kano, and in urban areas of Kinshasa, Kongo Central, and Lagos.

Our analysis identified two dimensions of economic empowerment. The first dimension, household decision making, was consistent and reliable across all six settings and over the two rounds analyzed per setting. The items included in this dimension were women's role in making decisions about purchasing large household items, daily needs, medical treatment, and clothes. Even though there is limited evidence about the psychometric properties of items proxying women's household decision making, there have been plenty of studies that looked at the proportion of in-union women who can decide on similar purchases (Kishor and Subaiya 2008; Chakrabarti 2017; Fox and Romero 2017), and some that have assessed the consistency across settings and over time (Miedema et al. 2018; Mganga et al. 2021; Calvi, Penglase, and Tommasi 2022). Rossella Calvi, Jacob Penglase, and Denni Tommasi (2022) implemented machine learning techniques to select variables that measure women's power and resource control in Bangladesh, identifying six consistent questions (out of 61) related to women's economic activity, salary, participation in livestock raising, and satisfaction with leisure activities. The findings from Andrew Mganga et al. (2021) and Stephanie Miedema et al. (2018) are more aligned with our findings. Decisions related to purchasing medical treatment, large household items, and visiting family and relatives were identified as items reflective of women's power in making decisions in the household. However, Miedema et al. (2018) identified additional items that were not consistently reported in all the countries they analyzed, such as the spending of partner's earnings, and Mganga et al. (2021) limited their analysis to Tanzania.

The second dimension, financial autonomy, was consistent and reliable only in Kenya, Lagos, and Kano. The literature review conducted by Ushma Upadhyay et al. (2014) defined financial autonomy as a construct proxied by a woman's ownership of a bank account, her ability to work outside

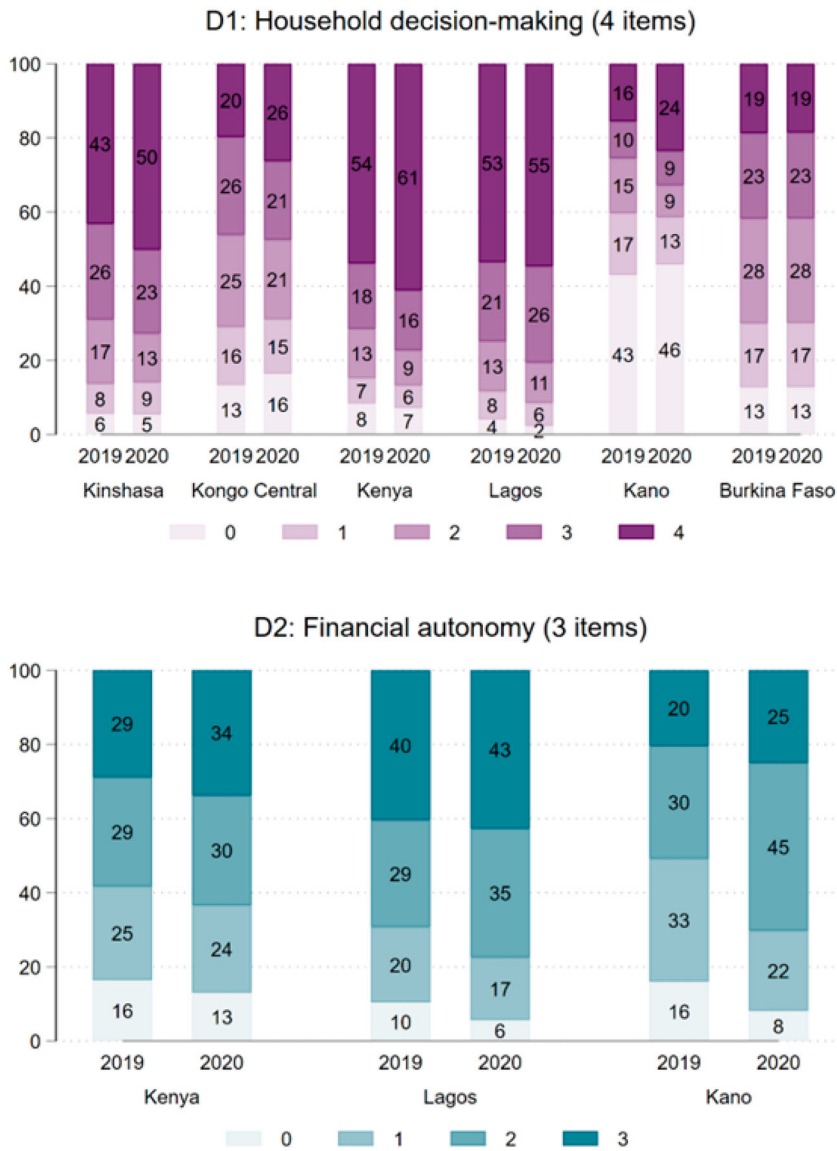

Figure 1 Distribution of women by level of empowerment per dimension of women's economic empowerment, by setting and survey phase

the house, to make budgetary-related decisions, and whether she could survive without her husband. In our study, financial autonomy is a construct proxied by a woman's ownership of savings, knowledge of where to obtain financial information, and financial goals. This dimension captures the

resource component that is part of the theorized definition of economic empowerment (Kabeer 1999; Buvinic et al. 2020). Mayra Buvinic et al. (2020) identified eight economic features as contextual factors that are part of their conceptual framework to measure WEE. Some of those features include women's access to business and financial services, such as having a bank account and being able to borrow money. The DHS does not have an indicator for financial autonomy; however, they have some proxy measures of women's bank account ownership, participation in the labor market, and whether their labor is remunerated. The measurement of this dimension of WEE has been less studied than women's power in household decision making, and there is less evidence about its psychometric properties.

Strengths

Our study offers several strengths. The foremost is related to the survey design and the data collection process implemented by PMA. The questionnaires are standardized across settings, with some questions added or dropped between survey rounds. This means that the WEE questions we used for this analysis were consistently phrased in the six settings. Standardizing the questionnaires does not mean that all women interpret the questions equally. Women may have a different definition for "large" or "daily needs," and the question about savings could be interpreted for some women as their own savings and for others as their family savings. The data collection process is also standardized. In each setting, a woman data collector, known as a resident enumerator, interviewed women in their household and recorded the responses on a mobile phone (PMA 2021). This standard process minimizes potential biases that can result from the survey, or if they exist, these are systematic biases across the six settings. However, the degree to which systematic biases affect the data in a given setting may vary. A second strength, also related to the survey design, is that the first wave of data was collected prior to COVID-19, between November and December of 2019, and the second wave during COVID-19, between November 2020 and March 2021. The COVID-19 pandemic has caused an economic downturn in terms of resource availability in the household and food insecurity (Gummerson et al. 2021). Despite this shock, we found that our two proposed measures of WEE were consistent and reliable over time and even recorded changes in levels of WEE.

It is also important to ensure that a metric is measuring what it purports to (also known as criterion validity). We expand the validation of the WEE scale by assessing the degree to which the scale is associated with WEE-related measures, such as women's education. Prior research has shown there is a link between WEE and education (Kabeer et al. 2013; Azra Batool, Ahmed, and Qureshi 2018; Riaz and Pervaiz 2018; Abbas et al. 2021), and some studies suggest it has the strongest association

with WEE (Hanmer and Klugman 2016). Naila Kabeer et al. (2013) find that secondary education and formal wage employment correlate higher than other common demographic variables with empowerment measures across three countries. Fernanda Ewerling et al. (2017) proposed the Survey-based Women's emPowERment (SWPER) index for women's empowerment, measured across thirty-four African countries using survey data, with a component of decision making, that correlated strongly (0.75) with education. We estimated a multinomial logistic regression model using education as a function of household decision making and financial autonomy, controlling for the place of residence, parity, age, and the number of members in the household. We found a significant relationship of household decision making and financial autonomy on education. The Relative Risk Ratio (RRR) for participating in one additional decision in the household was 1.07 when comparing Post-Primary/Secondary to None/Primary and 1.3 when comparing Tertiary/College to None/Primary. The RRRs for financial autonomy were 1.5 and 2.9 for Post-Primary/Secondary and Tertiary/College compared to None/Primary. These results are shown in Online Appendix, Table A8.

In our scale proxying household decision making, we considered a woman as empowered if she were the sole decision-maker or if she made the decisions with her partner, but she was not empowered if her partner or someone else were the decision-makers. Some could argue that this binary definition could limit the results of our study, as economic empowerment is not necessarily a binary process (Chakrabarti 2017; Buvinic et al. 2020). A woman can have levels of empowerment as she can be fully empowered in some areas, for example, if she decides about her medical treatment, but less empowered in other areas, for example, if she does not participate in household purchase decisions. To assess the sensitivity of our results, we implemented an alternate definition of our input variables defining empowerment into levels. A woman was categorized as having "no control" if someone else or her partner alone decided by themselves, she was "somewhat in control" if she and her partner made decisions together, and she was in "full control" if she made the decisions by herself. We repeated our analysis with this definition, and our conclusions did not change. The levels of reliability were slightly lower, but all were above 0.6.

Limitations

A limitation of our study is a lack of measures on agency, autonomy, and desires around decisions. A woman who wants to participate in household decisions and cannot is different from a woman who does not participate and does not want to participate in household decisions. We usually only observe the outcome of the participation in household decisions, but this does not necessarily reflect what that person was free to choose to do.

Recommendations to measure agency quantitatively suggest three crucial elements should be considered: (i) goal setting (agency); (ii) the ability to achieve goals (resources); and (iii) acting on goals (achievements of well-being; Kabeer 1999; Donald et al. 2020). The PMA questionnaire did not include questions about whether women wanted to participate in the decisions we used to measure women's power in household decision making. Further work should explore the extent to which women are limited to participate in decisions that are relevant to them and if this affects our proposed scale.

For household decision making, some respondents reported that someone else – who was not the partner or the respondent – participated in the decision to purchase large items, daily needs, medical treatment, and clothes. The proportion of women who reported "someone else" as the decision-maker was low – it ranged from 0 percent for purchasing clothes in Lagos, Nigeria to 4.9 percent for purchasing large household items in Burkina Faso. Population surveys, such as PMA and DHS, do not further inquire into identifying the "someone else" involved in the purchase decision-making process. The person could be a mother-in-law, a mother, or a male figure like a father-in-law in a patriarchal setting. Further exploration of this aspect may help better understand the contexts of women's autonomy and agency.

A third limitation is that we only assessed the measurement of economic empowerment among in-union women. We are limited to including in-union women for household decision making because women need to bargain about decisions with someone in the household, but we could have included all women when we assessed the measurement of financial autonomy. We computed the KR-20 coefficient to assess the internal reliability of the three items proxying financial autonomy in a sample of in-union and not-in-union women. We found that the internal reliability improved slightly in all settings except in Kongo Central.

A fourth limitation of our analysis is the use of subnational data in some settings and national data in others because it could introduce regional biases. For example, we cannot know whether the results of the Nigeria samples are generalizable to other regions of Nigeria that were not surveyed. However, this could also be perceived as a strength because it allows us to understand subnational realities. In Kano, 46 percent of the women reported they had no power in any of the decision-making items proxying women's power in household decision making. In comparison, this proportion was only 2 percent in Lagos. Despite these large differences, the internal reliability of these items was adequate in both regions. In addition, we assessed the measurement invariance of our scale by implementing Multi-Group Confirmatory Factor Analysis (MGCFA) using the weighted least square mean and variance adjusted (WLSMV) estimator for the seven items measuring women's economic empowerment

in different groups. We choose the WLSMV estimator because we have ordinal variables. The groups we analyzed were: (1) across survey rounds (2 groups); (2) across countries within the Phase 1 survey (6 groups); (3) across countries within the Phase 2 survey (6 groups); (4) across countries in a pooled sample of Phases 1 and 2 (6 groups); and (5) across countries and survey rounds in a pooled sample of Phases 1 and 2 (12 groups). We present summary results of these analyses in the Online Appendix, Table A7. This table shows four fit indices to assess model fit: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Root of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). A model is said to have a good fit if the fit indices are within the following cut-offs: CFI $\geq$ 0.90, TLI $\geq$ 0.90, RMSEA $<$ 0.08, and SRMR $<$ 0.08. All fit indices shown in Table A-7 are within the accepted cut-off point and support good model fit. Thus, these results support our conclusion that our measure of women's economic empowerment (WEE) has cross-cultural and temporal construct validity across six settings.

Implications

The main programmatic implication from our study is that we identified a small set of questions that have cross-cultural and temporal consistency and reliability, mainly for household decision making. We know that adding questions to an already extensive questionnaire has a serious cost, given that fatigue and impatience can alter the accuracy of the response (Ambler, Herskowitz, and Maredia 2021). In addition, it is unrealistic to expect that a household or a health survey, such as PMA, can include a long set of questions measuring WEE. Our analysis helps to improve the efficiency of surveys aiming to measure WEE when the survey is not solely focus on women's empowerment and there is limited room for additional questions.

CONCLUSION

Defining a measure that captures WEE is an ongoing effort that varies across surveys; some use as few as five items while others use as many as 81. Most of these metrics were developed to monitor and evaluate interventions, and limited evidence exists about their psychometric properties. Our knowledge contribution is the analysis of the psychometric properties of ten items that were hypothesized to represent two dimensions of WEE. We proposed a scale that measures women's power in household decision making through four survey questions that proved to have cross-cultural and temporal construct validity and reliability across six settings. We also provide evidence of a potential scale for women's financial autonomy through three survey questions that proved to have cross-cultural and temporal construct validity and reliability in Kenya and Nigeria, but not

in all sites. By summarizing two dimensions of WEE into seven questions, we support improved efficiency of future surveys interested in measuring WEE. Moreover, our findings for the women's power in household decision-making scale were consistent across six diverse settings within four African countries, which suggests our scale could be generalized and implemented in other similar contexts in LMICs.

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NOTES

[1] The questionnaire does not inquire who is the "someone else" who participates in the household decisions.

[2] For this question, women were given the following response options: (i) not knowledgeable at all; (ii) not very knowledgeable; (iii) somewhat knowledgeable; and (iv) very knowledgeable. Options (i) and (ii) were coded as "no knowledge" and (iii) and (iv) as "yes knowledge."

[3] This coefficient is equivalent to Cronbach's alpha, except KR20 is designed for binary items. KR20 is a measure of reliability and assesses internal consistency. $KR20 = \frac{K}{K-1}\left[1 - \frac{\sum_{i=1}^{K} p_i q_i}{\sigma^2_{total}}\right]$, where p_i is the proportion responding positively to item i, q_i is $1 - p_i$, and K is the number of items in each scale.

[4] In a scree plot, the y-axis shows the eigenvalues of the pattern matrix, which represent the amount of variation, and the x-axis shows the number of components. This plot usually has an "L" shape, and it is recommended to retain the number of components that are above the "elbow" of the "L."

SUPPLEMENTAL DATA

Supplemental data for this article can be accessed online at https://doi.org/10.1080/13545701.2024.2339979.

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