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THE IMPACTS OF INTERNATIONAL MIGRANTS' REMITTANCES ON HOUSEHOLD POVERTY AND WELFARE IN THE GAMBIA

Ebrima Jammeh

Doctoral Fellow; University of Illinois, Springfield, IL, 62703, USA

ejamm2@uis.edu

Ismail Cole 

Professor Emeritus; PennWest University, California, PA, 15419, USA

cole@pennwest.edu

Abstract

This paper¹ examines the effects of international migrants' remittances on households' poverty and welfare levels in the Gambia, using a nationally representative survey sampling 13,281 households and applying poverty decomposition and propensity score matching methods to minimize potential endogeneity problems. It finds that remittance-receiving (RR) households fare much better than similar non-remittance-receiving (NRR) households in that they have lower incidence, depth, and severity of poverty levels, lesser probability of falling below the annual food poverty line (GMD 11,794.7) and the total (food and non-food) annual absolute poverty line (GMD 18,039.95), and higher per capita annual food and total (food and non-food) expenditure and, thus, enjoy larger gains in objective welfare. Concerning subjective welfare, RR households in the national and rural samples, on average, rate their absolute and relative

¹ * This study draws from the first author's master's thesis completed at the University of the Gambia under the supervision of the second author and addresses new issues, including the effects of international migrants' remittances on household subjective welfare, beyond the scope of the thesis. The constant support and helpful comments on his thesis by Dr. Momodou Fanneh and many of his lecturers are greatly appreciated.



standard of living higher than similar NRR households and are significantly more likely to think that their community standard of living improved in the last 12 months and that their financial situation is rich. Also, the RR households are more inclined to believe that poverty reduction is a priority of the government and, perhaps, more optimistic about the country's direction. Mostly, no differences in subjective welfare levels exist between the RR and similar NRR households in the urban sample. The results provide a rationale and legitimacy for strengthening policies (e.g., lowering the cost to remit and various forms of diaspora engagement) to facilitate remittance inflows and enhance their productive use in poverty reduction and sustainable socio-economic development in the Gambia.

Keywords: International remittances; household poverty; welfare; propensity score; The Gambia

INTRODUCTION

As in many developing countries, many households in the small, West African nation of the Gambia live in abject poverty and hardship characterized by food, housing, and other insecurities and low welfare (Taal (1989), Amuzu et al. (2018), World Bank (2018)). The reality and urgency of this situation are easily substantiated by employing three standard summary measures of poverty according to Foster, Greer, and Thorbecke (1984) (FGT). Namely, the headcount index indicating here the incidence or share of households whose monthly per capita total consumption expenditure is below the given poverty line; the poverty deficit or gap index (the depth of poverty) measuring how far off poor households are from the poverty line; and the poverty severity index depicting the level of inequality among the poor. Based on the headcount index, 78% of all Gambian households lived below the absolute monthly food and non-food poverty line of GMD 1,503.3 in the year under study (2015), while the poverty gap index was 37%, suggesting that, on average, 37% of income would have had to be transferred to the poor to raise their consumption expenditure to the said poverty line (Table 1). In addition, the poverty severity or intensity index for all households was 21%, signifying much inequality among the poor. However, these aggregate percentages mask the significant geographical differences in poverty. For instance, in 2015, rural households' headcount, poverty gap, and severity index values stood at 85%, 42%, and 25%, respectively (Table 1). In contrast, urban households had much lower but still significantly high percentages for these indexes at 59%, 21%, and 10%, respectively (Table 1). These differences are also evident at the regional level based on the Local Government Areas (LGAs) discussed below.

Table 1: The poverty status of the total, rural, and urban households based on the monthly per capita absolute food and non-food Poverty Line of GMD 1,503.3

	Poverty headcount	Poverty gap	Poverty severity
Total households	0.781	0.372	0.215
Rural households	0.854	0.425	0.251
Urban households	0.596	0.217	0.106

Note: The number of observations for total, rural, and urban households are 13,281, 9,946, and 3,335, respectively. *Source:* Jammeh's (2022) calculation based on GIHS 2015 survey data.

Besides poverty, most Gambian households also have to cope with various shocks and stresses due to environmental, economic, health, and other factors. For example, environmental stresses deriving from droughts, floods, and overexploitation of natural resources, including deforestation, negatively affect food and nutritional security, related to low educational achievement among children and chronic physical and mental problems (Jaff (2011), WFP (2012), GNSPP (2013), and Jones (2017)). Also, climate variation often impacts the traditional agricultural sector, which consists largely of rain-fed subsistence farming. Furthermore, the formal industrial sector is embryonic, and low-productivity activities dominate the economy. Informal employment accounts for 63 percent of the economy, and the youth unemployment rates are chronically high (e.g., 42% in 2015 (Jammeh (2022))), population growth pressures are rising (e.g., 3.5% between 2013 and 2015 GIHS (2015)), not to mention the abject violations of personal, religious, and political freedoms during the reign of the military government from 1996 to 2016 (Kebbeh (2013), and Altrogge and Zanker (2019)).

This sorry state of affairs has had at least two important consequences. First, it served as a push factor causing a rising trend in emigration as many Gambians, especially the youths and high-skilled professionals, seek employment and better economic opportunities in other African countries and elsewhere (Kebbeh (2013) and Altrogge and Zanker (2019)). The data source for this study (GIHS (2015)) allows estimation of the emigration rate for the 2015 year. The rate is defined here as the number of emigrants' households divided by all households expressed per 100 households. We estimate that the emigration rate was 24.6, 16.1, and 12.8 per 100 households at the national, urban, and rural levels, respectively. However, the rates varied substantially across the eight Local Government Areas (LGAs), with the urban and semi-urban LGAs of Banjul, Kanifing, Brikama, and Mansakonko sending out proportionately lower numbers of emigrants (3.6, 9.2, 11.0, and 13.3 per 100 households, respectively) compared to the rural, less developed, and scarcer job opportunities LGAs of Kerewan, Kuntaur,

Janjanbureh, and Basse (16.8, 20.7, 23.3, and 24.3 per 100 households, respectively). These rates suggest that emigration (and the resulting remittances) is a main collective household strategy to cope with the various shocks and stresses discussed above, as maintained by the New Economics of Labor Migration (NELM) literature (e.g., Stark and Bloom (1985), Lucas and Stark (1985), and Rosenzweig and Stark (1989)).

Second, the sad state of affairs has also caused a surge in the calls for various measures to improve the situation of poor and vulnerable households. One of these measures is to provide safety nets, which, as a key component of carefully planned social protection strategies, have effectively supported poverty reduction and socio-economic development (Brown and Gentilini (2006)). However, the Gambian social protection system is in a rudimentary state, and thus, its core elements of social services, social assistance, social insurance, and labor market programs could be better (Carrasco et al. (2022)). Growing concerns over these systemic weaknesses have led to at least two positive developments. First, the launching in 2013 of the Gambia's first National Social Protection Policy 2015-2025 (GNSPP), whose main goal is to ultimately "...offer more predictable, reliable and sustainable support to assist its population in coping with shocks, while contributing to poverty reduction and building long-term resilience to risks" (GNSPP (2013, p. 7). Second, the concerns also spurred the development of community-based safety nets (CBSNs) that range from "... informal exchange of transfers and loans to more structured institutions such as Kafo and Osusu groups and the Islamic concept of Zakat" (UNICEF, 2015-2025, p. 30)ⁱⁱ. However, paralleling these developments and already a major safety net providing many households with much of the needed social protection in recent years has been international remittances sent back home by emigrants, who are motivated to remit by time-honored socio-cultural practices that promote the moral responsibility to fulfill extended family and kinship obligations in times of need through cash and in-kind transfers (Brown and Jimenez (2011) and Jimenez-Soto and Brown (2012)) and a sense of patriotism, loyalty, and other motivesⁱⁱⁱ. Importantly, the remittances have proven to be more resilient than internal transfers in the face of the shocks and stresses discussed above and are increasingly recognized by scholars, policymakers, and others for their potential to help in poverty reduction and socio-economic development (Rodima-Taylor (2015), and Ceesay et al. (2019))^{iv}.

In line with global trends, the Gambia has experienced a phenomenal increase in international migrant remittances in the last few decades^v. Specifically, it saw a ten-fold increase that raised the officially recorded remittances (from African and other countries) from US\$54 million in 2003 to an all-time high of US\$547 million in 2021 (World Bank (2022))^{vi}. These figures are impressive in their own right and, as noted, are attracting growing interest due to

their potential to impact household poverty alleviation and welfare positively; however, they are less so than most countries. Indeed, the Gambia ranks only 42nd out of 54 African countries and 175 out of 195 countries globally regarding nominal annual officially-recorded remittances received, a situation explained most obviously by its small population (2.64 million in 2021), small GDP size (US\$2.038 billion in 2021), high costs of transferring remittances,^{vii} and a relatively small diaspora population^{viii}. However, its low remittance-recipient status contrasts sharply with its high remittance-dependent one. The latter is apparent when the remittances are viewed as a share of its macro economy. For instance, this share, which was 8% of its GDP in 2009, was 28.3% of GDP in 2022, which ranked it first in Africa after trailing Comoros, Lesotho, Liberia, and South Sudan for several years in this metric and ranked sixth globally behind Tonga (49.9%), Lebanon (37.8%), Samoa (33.7%), Tajikistan (32.1%) and the Kyrgyz Republic ((31.3%) (World Bank-KNOMAD (2022)). Also, the Gambia's heavy reliance on international remittances is reflected in the increasingly crucial and resilient role of remittances as a source of much-needed external finance for many years^{ix}. In fact, except for official development assistance and aid received (ODA), the remittances far exceeded other sources of such finance, including foreign direct investment (FDI) and the receipts from international tourism in thirteen of the nineteen years from 2003 to 2021. The reliance on international remittances is further evident at the micro household level, with 25% of households receiving such remittances in 2015 currently under study (GIHS (2015)). However, more recent data indicate that up to 47 percent of households depend on international remittances (IMF, African Department (2021)). These figures rank the Gambia first among Sub-Saharan African countries concerning such dependency.

The above discussion underscores our previous point that many Gambian households remain impoverished and rely heavily on international migrants' remittances. Thus, the Gambia offers a suitable, timely, and interesting case for examining how such remittances might affect household poverty and welfare, an issue of obvious importance in assessing the prospects and consequences of poverty alleviation and related public policies. Also, since this issue is vastly understudied in the Gambian context, the Gambia provides a novel setting for studies of this nature, with the potential to provide new insights that may confirm, refute, or challenge some of the important findings of the already vast and growing empirical literature (e.g., Adam (1991 and 2006), Acharyaa and Leon-Gonzaleza (2012), Iqbal (2013), Bertoli and Marchetta (2015), Adams and Page (2005), and Acosta et al. (2008)). Although the emerging consensus in this literature is that remittances reduce the level, depth, and severity of poverty and, hence, improve welfare, the estimated effects vary greatly depending on, for example, which of these dimensions of poverty is considered, whether the remittances are international or domestic, the

countries or region studied, and the approach adopted. For example, Adams (2006) study on the effects of remittances on poverty in Ghana reported that international remittances are more effective at poverty alleviation than domestic remittances. Specifically, in the case of the depth or poverty gap, the latter reduces poverty by 4.1 percent while the former lowers it by 34.8 percent. Similarly, Acosta (2008) investigated the effects of international migrants' remittances on poverty and inequality in Latin America and found that while these remittances reduce poverty, the effects vary greatly depending on the beginning levels of inequality and development in each country. Also, Ebele et al. (2005) used data from the 2004 Nigerian National Living Standard Survey to study the effects of remittances on poverty and inequality in Nigeria and found that the remittances reduce poverty significantly with the remittance-receiving households less likely to be impoverished. Using Pakistani data, Iqbal (2013) asserts that remittance inflows can significantly increase the economic well-being of low-income households while lowering poverty by increasing the income of the recipient nation and fostering improved health and education. Adams (1991) demonstrated that international remittances have a tiny but beneficial impact on poverty levels in rural Egypt using data from the Household Surveys conducted in 1986 and 1987. Furthermore, when international remittances are included in expected per capita household income, poor households decreased by 9.8%. In the Gambian context, Ceesay et al. (2019) and Ceesay (2020) found that personal remittances serve as a significant source of international exchange reserves, aid in lowering the country's poverty level, and increase employment in agriculture and economic growth.

Against the above background, the objectives of this paper are twofold. The first empirically investigates international remittances' effects on households' poverty levels and objective welfare as measured by household consumption expenditure and various poverty measures. To this end, we address in the Gambian context three key questions on which much research on other countries has been centered:

- (1) Do international remittances lower the household poverty level as measured by the incidence, depth, and severity of the poverty at the national, urban, rural, and Local Government Area levels, and if so, what is the size of the reduction?
- (2) Do international remittances lower household poverty by increasing per capita total consumption expenditures at the mentioned geographical levels, and if so, what is the size of the increase?
- (3) Do international remittances lower the probability of households falling below the annual per capita absolute (food and non-food) poverty line of GMD 18,039.95 and if so, what is the size of the reduction?

The second objective of this study relates to the small but growing literature on the effects of international migration (remittances) on subjective household welfare (SHW), as reflected by the household respondents' self-perception or assessment of their welfare (e.g., Semyonov and Gorodzeisky (2008), Stillman et al. (2013), Andersson (2014), Borici and Gavoci (2015), and Arapi-Gjini (2022)). Material and subjective welfare capture a broader and more realistic view of household welfare. However, how the remittances might influence SHW per se is unresolved in the literature, with studies suggesting a favorable, adverse, or even neutral impact and, thus, revealing the complexity of the migration/remittances and SHW relationship (Stillman et al. (2013)). This complexity derives from various factors, including the channels through which the impact is exerted, the geographical and social contexts involved (e.g., a poor country with weak social welfare systems), the definition and level of aggregation of SHW, and the research methods employed. For example, suppose material and subjective welfare correlate well. In that case, an improvement in the households' financial security and material well-being may positively impact SHW (e.g., Ivlevs et al. (2018) for a panel data of 114 countries and Cardenas et al. (2009) for Latin American countries). Another possibility is that the remittances may reduce SHW if the benefits from them do not sufficiently compensate the migrant households left behind for the monetary and non-monetary costs of migration resulting from, for example, the stress, depression, pain of separation, and resulting household disruption (e.g., Borraz et al. (2010)). However, the benefits from the remittances may offset migration costs, resulting in no differences in SHW between RR and similar NRR households, as reported by Borraz et al. (2010) for Ecuador. In this study, we use the Propensity Score Method (PSM) estimation results to compare and contrast the RR and otherwise similar NRR households based on their perception or assessment of their welfare level, their welfare relative to other households and the overall community welfare level, their financial situation, and their perception of the government's resolve or determination to reduce poverty.

METHODOLOGY

Data description

As stated, we obtained the cross-sectional data for this study from the Gambian Integrated Household Survey (GIHS (2015)) conducted by the Gambia Bureau of Statistics (GBOB), with technical and financial assistance mainly from the World Bank and the United Nations Development Program (UNDP). The survey uses a two-stage sampling method involving urban and rural areas.^x It has a nationally representative sample size of 13,281 households, 10,005 (75%) of which did not receive international remittances, while the remaining 3,276 (25%) received them^{xi}. Table 2 shows some selected demographic and

socioeconomic characteristics for all households, international remittances-receiving (RR) households and the non-remittance-receiving (NRR) households, along with the results for the test of equality of means for the latter two households, which are statistically significant in each case^{xii}. Comparing the RR and NRR household-level characteristics, the table shows that in terms of size (HHSIZE), the age of the head of household (HHHAGE) and homeownership (HHOWNER), the RR households are slightly bigger (8.43 compared to 7.81 members), have a slightly older head of household (49.66 compared to 47.40 years), and more likely to own the house they live in (0.83 compared to 0.78), respectively. However, NRR households are more likely to have a head of household who is male (HHHMALE) (0.87 versus 0.78), and who is married (HHHMARRIED) (0.90 versus 0.89). Another demographic characteristic relates to the dependency ratio, which allows us to compare the poverty profile of the two types of households, defined here as the percentage of household members below 15 years and 64 years and over (HHDEPRATIO). The lower this ratio is for a household, the higher the living standard, all else equal. Table 2 shows that RR households have a lower dependency ratio than NRR households (1.10 versus 1.16), preliminarily suggesting that international remittances may reduce household poverty, all else equal.

There are also noticeable differences concerning education, where, on average, the RR households achieved a higher level whether in terms of the total number of members with education (TNUMHHEDU) (2.90 versus 2.49), total and percentage of members with primary education (NUMHHPRI) (1.60 versus 1.39) and PERNUMHHPRI (0.19 versus 0.17), respectively, the number (NUMHHSEC) and percentage (PERNUMHHSEC) of members in secondary school (1.16 versus 1.00 and 0.16 and 0.14, respectively), and the number (NUMHHTER) and percentage (PERNUMHHTER) of members with tertiary education (0.14 versus 0.09 and 0.03 and 0.02, respectively). These numbers suggest that RR household members, on average, are formally more educated and have higher educational attainments than NRR household members.

Regarding financial and productive assets, RR households also fare better than NRR households. Specifically, RR households are more likely to have a saving account (HHSAVEDUM) (0.41 versus 0.33) and own livestock (HHLSTOCK) (0.73 versus 0.71); however, NRR households are more likely to operate a non-agricultural business (ENTERDUM) (0.20 versus 0.16).

Regarding crimes, however, the NRR households fare better than the RR households. Specifically, the NRR households are more likely to report that they have experienced no crime in the last 12 months and feel safe walking down the street at night, while the RR households are more likely to report that they have experienced crime in the last five years. These and the

preceding descriptive statistics indicate that significant socioeconomic and demographic differences exist between RR and NRR households, posing a challenge to directly comparing the remittances' causal effects on the poverty and well-being of the two household types, an issue addressed in the methodology section.

Table 2: Socio-economic and demographic characteristics of all households, households with and without remittances

		1	2	3	4
Variables		All households	Remittances non-recipient	Remittances recipient	T test for equality of means between (2) and (3)
		(N=13,281)	(N=10,005)	(N=3,276)	
Name	Description	Mean	Mean	Mean	t/p-value
HHHAGE	HH Head age	47.96	47.4	49.66	-7.85/0.00
HHHMALE	=1 if male, = 0 otherwise	0.85	0.87	0.78	12.95/0.00
HHHMARRIED	=1 if HH Head married, = 0 otherwise	0.90	0.9	0.89	2.30/0.02
HHSIZE	Household size	7.97	7.81	8.43	-5.80/0.00
HHOWNER	=1 if HH owns house it lives in, 0 = otherwise	0.79	0.78	0.83	-5.50/0.00
HHDEPRATIO	% of HH members < 15 and > 64 years of age	1.14	1.16	1.1	3.30/0.00
TNUMHHEDU	Total number of HH members with education	2.59	2.49	2.9	-7.85/0.00
NUMHHPRI	Number of HH members with Primary education	1.45	1.39	1.6	-6.15/0.00
PERNUMHHPRI	Percent of HH members with Primary education	0.18	0.17	0.19	-4.55/0.00
NUMHHSEC	Number of HH members with Secondary education	1.04	1	1.16	-5.10/0.00
PERNUMHHSEC	Percent of HH members with Secondary education	0.15	0.14	0.16	-4.65/0.00
NUMHHTER	Number of HH members with Tertiary education	0.1	0.09	0.14	-5.70/0.00

PERNUMHHTER	Percent of HH members with Tertiary education	0.03	0.02	0.03	-3.30/0.00
HHSAVEDUM	=1 if HH has saving account, 0 = otherwise	0.35	0.33	0.41	-7.80/0.00
HHLSTOCK	=1 if HH owns livestock, 0 = otherwise	0.72	0.71	0.73	-2.10/0.04
ENTERDUM	=1 if HH operates non-agric. enterprise, 0 = otherwise	0.19	0.2	0.16	5.00/0.00
CRIMEDUM1	1= HH experienced no violence last 12 months, 0 = otherwise	0.74	0.74	0.72	2.75/0.01
CRIMEDUM2	1= HH feels safe walking down the street at night, 0 = otherwise	0.69	0.71	0.63	8.55/0.00
LGAHHCRIME5	% of HH experiencing crime in last 5 years	10.47	10.41	10.66	-5.35/0.00

Table 2....

Source: Authors' calculations based on GIHS 2015 survey data

Outcome Variables for Material Welfare

We first consider household objective (economic or material) welfare, which is often based on consumption, income, and certain measures of the household's poverty status (e.g., Iqbal (2013) and Arapi-Gjini (2022)). We used four measures of objective welfare. The first two are based on household consumption, which is considered less volatile than income in the face of short-term shocks and fluctuations and, thus, a more robust measure of welfare (e.g., Deaton and Zaidi (2002) and GIHS (2015)). Specifically, household consumption is divided into food consumption (including household-produced food) and expenditures on a range of nonfood goods and services (e.g., clothing, utilities, transportation, health, and education) (GIHS (2015)). We used household annual food and total (food and nonfood) expenditure expressed on a per capita basis to obtain our first two measures of objective welfare, namely, the household annual food expenditure per capita (HHAFEXPENDPC) and household total (food and nonfood) expenditure per capita (HHAFNFEXPENDPC). These measures are reported in Panel A of Table 3 for the different household types^{xiii}. As seen from this table, the mean average annual food consumption for NRR households was GMD11,400, while that for RR households was GMD13,881. However, when food and nonfood consumption expenditures are combined, the annual food and nonfood consumption per capita (HHAFNFEXPENDPC) of NRR households

(GMD 21,491) exceeded that for the RR households (15,967), suggesting that the former households spend a larger share of their budget on nonfood items than the latter households. A reasonable explanation for this situation is that RR households, unlike the NRR households, received significant amounts of nonfood items from their family members abroad; thus, they may not need to spend relatively high amounts on such items compared to the NRR households. This explanation is consistent with the large importation of secondhand goods (mostly nonfood items) in recent years from the United States, Europe, and Asia to The Gambia by family members in the diaspora (Jaabi (2018)). Also, that RR households are spending relatively less on nonfood items than NRR households could be because the former households save more, as indicated above by their higher likelihood of having a savings account.

Table 3: Measures of mean objective and subjective welfare for all households, households with and without remittances

		1	2	3	4
Variables		All households	Remittances non-recipient	Remittances recipient	T test for equality of means between (2) and (3)
		(N=13,281)	(N=10,005)	(N=3,276)	
Panel A: Measures of objective welfare					
Name	Description	Mean	Mean	Mean	t/p-value
HHAFEXPENDPC	HH Annual food consumption expenditure per capita	12011	11400	13881	-12.5/0.00
HHAFNFEXPENDPC	HH Annual food and nonfood expenditure per capita	20138	21491	15967	0.54/0.29
HHAFPOVLINE	1= HH Annual food poor(<GMD 11794.66, 0 = otherwise)	0.63	0.67	0.55	11.1/0.00
HHAFNFPOVLINE	1=Annual absolute poor(<GMD 18039.95, 0 = otherwise)	0.78	0.81	0.72	10.8/0.00

Panel B: Measures of subjective welfare					
RICHLDUM	=1 if HH is either "Fairly rich" or "Rich" and 0 = otherwise	0.024	0.022	0.031	-2.16/0.009
POORLDUM	=1 if HH is either "Poor" or "Very poor" and 0 = otherwise	0.64	0.65	0.59	6.15/0.00
ILSTANDDUM	=1 if HH living standard increased last 12 months and 0 = otherwise	0.22	0.21	0.25	-4.10/0.00
RRSTANDDUM	=1 if HH rates its living standard either "Rich" or "Fairly rich" relative to other HHs	0.03	0.03	0.04	-2.65/0.01
RPSTANDDUM	=1 if HH rates its living standard either "Very poor" or "Poor" relative to other HHs	0.59	0.60	0.56	4.20/0.00
ICSTANDDUM	=1 if HH's community living standard increased in last 12 months and 0 = otherwise	0.24	0.23	0.27	-5.40/0.00
RICHFINDUM	=1 if HH financial situation is either "fairly rich" or "Rich" and 0 = otherwise	0.025	0.02	0.03	-1.75/0.08
POORFINDUM	=1 if HH financial situation is either "Very poor" or "Poor" and 0 = otherwise	0.62	0.63	0.57	6.10/0.00
GOVPRIORITY	=1 if HH thinks poverty reduction is a priority of the government, 0 = otherwise	0.90	0.90	0.92	-3.80/0.00

Source: Authors' calculations based on GIHS 2015 survey data

In addition to the two measures of objective welfare, we consider two measures based on households' poverty status. These measures relate to the poverty lines for the Gambia based on (i) the Cost-of-Basic Needs method for the monthly cost of meeting 2400 kilocalories per day per person estimated at monthly GMD 982.9 (the per capita Food Poverty Line) and (ii) the per capita Absolute Poverty Line relating to food and nonfood consumption which is set at monthly GMD 1,503.3 (GIHS (2015)). For consistency with subsequent analysis, we use the annual counterparts of these measures, namely, the household annual food poverty line (HHAFPOVLINE) set at GMD 11,794.66 and the absolute annual food and nonfood poverty line set at GMD 18,039.95. Thus, households whose per capita annual food expenditure and food and nonfood expenditure fall below these poverty lines are considered the food poor and the absolute poor, respectively, and of course, those at or above these lines are the non-poor. Based on these measures, households receiving remittances fare better than non-recipients. Specifically, Panel A of Table 3 shows that a smaller percentage of RR households are likely to live below the HH annual food poor line of GMD 11,794.66 than the non-recipients (HHAFPOVLINE) (0.55 versus 0.67), and fewer RR households live below the absolute food poor line of GMD 18,039.95 than non-recipients (HHAFNFPOVLINE) (0.72 versus 0.81). In the empirical results section, we provide estimates of the extent to which international remittances lower the probabilities of RR and NRR households falling below the food and absolute poverty lines.

Outcome Variables for Subjective Welfare

As stated, the second type of welfare (subjective) considered is based on the household respondents' self-perception or -assessment of their welfare level, their welfare relative to other households and the overall community welfare level, their financial situation, and their perception of the government's resolve or determination to reduce poverty, using the answers to simple well-being survey questions (e.g., Andersson (2014), Borici and Gavoci (2015), and Arapi-Gjini (2022)). Specifically, we derived nine outcome variables or measures based on six survey questions. The first question has five optional responses and asks, "*How do you feel about your livelihood based on your income - very poor, poor, moderate, fairly rich or Rich?*" For this question, we created a dummy variable which is equal to one if the household is either "Fairly rich" or "Rich" and zero otherwise and referred to as *HH livelihood rich based on income* (RICHLDUM), and another dummy variable equal to 1 if the household is "poor" or "very poor" and zero otherwise called *HH livelihood poor based on income* (POORLDUM).

The second question relates to whether households believed their (absolute) living standard changed over time: “*During the last 12 months, has your household living standard Changed?*” Given the three optional responses: *Increased, Stayed the same or Decreased*, we created a dummy equal to one if the living standard increased in the last 12 months and zero otherwise, and called it *HH living standard improved during last 12 months* (ILSTANDDUM).

The third question allows assessment of the household’s relative living standard by asking, “*How would you rate your standard of living relative to other household members in your community?*” The response categories are *Very poor, Poor, Moderate, Rich, and Rich*. The first dummy variable was created with the response categories “Rich” and “Fairly rich” combined and referred to as *HH living standard rich relative to other HHs* (RRSTANDDUM), and the second dummy combined “very poor” and “poor” and called it *HH living standard poor relative to other HHs* (RPSTANDDUM).

The fourth question assesses possible change in overall community living standards and asks, “*During the last 12 months, has your community living standard changed?*” with response categories of *i. Increased; ii. Stayed the same; iii. Decreased*. We created a dummy variable equal to one if the community living standard increased in the last 12 months and zero otherwise and referred to it as *community living standard improved during the last 12 months*. (ICSTANDDUM).

The fifth question allows the household to assess its financial situation: “*What is your household’s financial situation - very poor, poor, moderate, fairly rich or rich?*” We created two dummy variables, equal one if the financial situation is either “fairly rich” or “rich” and zero otherwise, called it *HH financial situation rich* (RICHFINDUM), and the other equal to one if the financial situation is either “very poor” or “poor” and zero otherwise and referred to as *HH financial situation poor* (POORFINDUM).

The final question assesses the household’s perception of how serious or determined the government is in reducing poverty and asks, “*Do you think poverty reduction is a government priority?*” We assume that this perception correlates well with the level of SHW and, thus, a response in the affirmative to the question may positively impact subjective welfare. We created a dummy variable equal to 1 if the response is “Yes” and zero otherwise and referred to it as GOVPRIORITY.

Panel B of Table 3 reports descriptive statistics based on the means and the test results for the equality of means for RR and NRR households regarding the nine measures of subjective welfare. On the face of it, these measures suggest that international remittances have a positive and statistically significant effect on subjective welfare, with significant differences between RR and NRR households. Specifically, RR households, on average, rate

their absolute and relative standard of living higher than NRR households, are more likely to think that their community standard of living improved in the last 12 months, have a *rich financial situation*, and are more likely to believe that poverty reduction is a priority of the government. However, it is important to note that these results are preliminary because we have yet to subject the matter to a more formal and conclusive assessment based on our adopted PSM method, which addresses the possible endogeneity between migration and remittances. Indeed, Borraz et al. (2010) stress the need to address this issue because of two underlying and opposing factors at work. That is, on the one hand, migration imposes costs on the migrant households left behind in terms of, for example, the household members “missing the company” of the migrants, assuming chores previously undertaken by the migrants, and possibly financing the migration, all of which are likely to reduce the happiness or welfare of the households left behind.

On the other hand, the remittances are expected to reduce these costs by increasing the households’ income and welfare. Thus, whether there is a difference in the levels of subjective welfare between RR and NRR households depends on whether the remittances sufficiently compensate for the mentioned costs. As previously reported, Borraz et al. (2010) concluded that once these factors are accounted for, no difference in the levels of such welfare exists between the two types of households in Ecuador. We revisit this issue in the empirical results section.

Empirical Model Specification

As previously stated, we adopt several commonly used methods to investigate the effects of international remittances on household poverty and welfare in the Gambia. To determine how these remittances affect key dimensions of the poverty level (i.e., the incidence, depth, and severity of household poverty discussed earlier), we apply the Foster, Greer, and Thorbecke (FGT) (1984) poverty decomposition method, which can be expressed as:

$$FGT_{\alpha} = \frac{1}{N} \sum_{i=1}^H \left(\frac{z - Y_i}{z} \right)^{\alpha} \quad (1)$$

where N represents the total number of households, H is the total number of poor households based on the given poverty line (z), and Y_i is the welfare indicator, in our case, household consumption expenditure per capita, α is a parameter proxying for inequality aversion which when it takes the values of zero, one, or two reduces to the headcount/incidence index, the poverty deficit or gap index (the depth of poverty), and the poverty severity index, respectively. The estimated results of the FGT method are discussed in the results section.

Crucial to achieving the objectives of this study is the need to, among other things, directly compare the causal effects of international remittances on poverty for the Gambian

households receiving the remittances (the “treated” households) with otherwise similar households that did not receive them (the “non-treated,” “counterfactual,” or controlled households), in order to estimate the average treatment effects of the remittances. However, it is well-known that household data collection is not based on a randomized system but draws the data from observational (nonrandomized) data sets. So, whether households receive remittances or not may be influenced by household member differences in measured characteristics such as age, gender, and level of education, unmeasured characteristics such as skills, ambition, and motivation, and spatial or regional differences in economic and socio-demographic factors such as unemployment and crime rates (Stark and Taylor(1985 and 1989), Andersson (2014), and Hua et al. (2022)). Since these characteristics may be correlated with our outcome variables measuring household welfare, a direct comparison of the treated and controlled households may lead to biased estimates of the causal effects of remittances on these variables (the treatment selection bias). In other words, estimating the average treatment effect using observational data can produce biased results when non-experimental data is used (Esquivel and Pineda (2006)). One popular and well-established approach to address the possible treatment-selection bias adopted here is the Propensity Score Matching (PSM) method (Rosenbaum and Rubin (1983 and 1985) and Austin (2011)). This method simplifies comparing the treated and control households based on their characteristics by creating a summary index into a propensity score (PS) that measures the probability that a household in the full sample receives remittances, given a set of observed pre-treatment characteristics. Thus, the PS allows the treated and control household groups to be ranked based on their PS and matched with similar households from the other group using alternative matching methods. The PSM method performs better in larger samples, which are more than 1,000 observations (Zhao (2004) and Thapa and Acharya (2017)) and, thus, is well suited for our study based on 13,281 observations.

The PSM allows us to estimate the average treatment effect on the treated (ATET) or impact of the remittances, defined as the difference between the outcomes of the treated (Y_1) and that of the control (Y_0) households:

$$(equation 2) \Delta = Y_1 - Y_0,$$

Assuming each outcome is observable. If D is a binary variable indicating the remittances status of the household such that it is equal to 1 for the treated household and zero otherwise, and X is a vector of the previously mentioned characteristics, we can state:

$$(equation 3) ATET = E(\Delta) = E(Y_1 | X, D = 1) - E(Y_0 | X, D = 0)$$

However, we need to express the ATET to reflect the difference between the outcomes of the treated and the outcomes of the treated if they had not been treated to have remittances:

$$(equation 4) ATET = E(\Delta | D = 1) = E(Y_1 | X, D = 1) - E(Y_0 | X, D = 1)$$

Note that the first term, $E(Y_1 | X, D = 1)$, is an observed factual outcome, while the second term, $E(Y_0 | X, D = 1)$, is a counterfactual outcome, defined as the outcome resulting if the households receiving remittances had not received them. Since the counterfactual outcome is not observable, it must be reliably estimated. This estimation is accomplished by making use of the matching methods discussed below. These methods allow each household receiving remittance to be matched with the controlled household with similar characteristics, as reflected by their propensity scores. As a result, the average treatment effect on the treated is solely based on the observable characteristics of treated and untreated households. Thus, the ATET can be restated as:

$$(equation 5) ATET = E(\Delta | p(X), D = 1) = E(Y_1 | p(X), D = 1) - E(Y_0 | p(X), D = 0)$$

This equation shows that the outcome for the controlled households ($E(Y_0 | p(X), D = 0)$) is used as the estimate for the counterfactual outcome ($E(Y_0 | X, D = 1)$). The validity of this estimation hinges crucially on two main assumptions: the conditional independence assumption (CIA) and the common support assumption (CSA) (overlapping assumption). The CIA implies that selection into treatment (receiving remittances) is completely determined by variables that the researcher can observe, and conditional on these variables, treatment assignment is random (Ichino et al., 2008). The second assumption of common support (CSA) ensures that an individual or group with the same covariates has a positive probability of being treated and untreated, that is, every possible combination of covariates (control variables), treated persons and untreated persons. Furthermore, the PSM depends on having a large and roughly equal number of participants and nonparticipants to find the area of common support.

Concerning the matching methods, we focus on three of them, which are adequate for testing the robustness of our results. Briefly, *Nearest Neighbor Matching* (NNM) matches the treated household with the k (5) nearest non-treated households based on the estimated propensity score, allowing the matching to be done with or without replacement. With replacement, an untreated household can be used more than once as a control household. The NNM is useful when there are many treated households with high propensity scores, but only a few compare households with high propensity scores, allowing all households to be matched. However, the NNM faces the risk of bad matches if the closest neighbor is far away. This situation can be avoided using *the Caliper and Radius Match* (CRM) method, which imposes a tolerance level on the maximum propensity score distance (e.g., 0.001). For example, A Caliper

set at 0.001 indicates that the propensity score should differ no more than 0.001 from the PS of the household when matching the two types of households.

Although the NNM and CRM only use a few observations from the comparison group, *the Kernel matching (KM)* method uses weighted averages of all individuals in the control group to construct the counterfactual outcome. Thus, KM matching has one major advantage of lower variance, achieved because more information is used by including all control households. Additionally, the KM method is likely more consistent and efficient when the data to be compared are large and asymptotically distributed, as in our case (Thapa and Acharya (2017)). Thus, in the following analysis, we focus on the results based on the KM method.

Following previous studies, we implement the PSM as follows. First, we estimate the PS using a probit regression model including the full set of variables discussed earlier:

$$(equation\ 6)\ Pr(D) = \begin{cases} 1 & \text{if } F(X, H, W) + \varepsilon > 0 \\ 0 & \text{otherwise} \end{cases}$$

where $Pr(D) = 1$ if the household receives remittance and zero otherwise, X is a vector of individual characteristics such as age, gender, and marital status; H is a vector of household characteristics such as household size and the proportion of the elderly or the young in the household; W is a vector of economic and social characteristics such as the local unemployment and crime rates, and ε is the error term. The estimated parameters of equation (6) are used to estimate the PS, which measures the predicted probability of each household receiving remittance given the already mentioned characteristics. Second, the propensity score for each household is used to match the treated and control households using the previously discussed alternative matching methods, whose results' quality is assessed using t-tests. Finally, the causal effects of remittances on the outcome variables (household expenditure, poverty measures, and subjective welfare measures) of the treated household group will be evaluated by considering the treatment effects explained above.

EMPIRICAL RESULTS

This section reports the results of our investigation of the effects of international migrants' remittances on the poverty and material and subjective welfare of Gambian households using cross-sectional data based on a nationally representative sample size of 13,281 households ((GIHS (2015))), applying the methods discussed in the previous section. Regarding material or objective welfare (MW), we first present the results of the FGT (1984) poverty decomposition method on how the remittances affect household poverty in terms of its incidence, depth, and severity at the national, rural, urban, and LGA levels based on the absolute (food and nonfood) poverty line of GMD 18,039.95; we then examine the PSM results on how the remittances affect

household per capita total consumption expenditures and the probability of households falling below the annual food poverty line of GMD 11,794.66 and the absolute (food and nonfood) annual absolute poverty line of GMD 18,039.95. Finally, we present the PSM results for subjective welfare (SW), relating to the household respondent's self-perception or -assessment of its welfare level, its welfare relative to other households, the overall community welfare level, its financial situation, and its perception of the government's resolve to reduce poverty.

Results of the FGT Index Decomposition

The FGT (1984) poverty decomposition method results for the headcount (incidence), poverty gap, and severity indexes based on NRR and RR households are reported in columns 1 and 2 of Table 4, respectively, while the percentage changes in these indexes attributable to international remittances are shown in column 3. The results show that these remittances significantly lowered the incidence, depth, and severity of Gambian household poverty at virtually all geographical levels. First, at the national level, the incidence of poverty, that is, the proportion of households whose annual per capita total consumption was inadequate in meeting their basic food and non-food needs based on the absolute poverty line of GMD 18,039.95, dropped from 75.5 percent in the absence of remittances to 62.4 percent in their presence, for a 16.7 percent reduction in the incidence of poverty. Furthermore, the national poverty gap index measuring how far off poor households are from the absolute food poverty line decreased from 33.9 percent in the non-remittances situation to 24.9 percent with remittances, a 26.5 percent drop in this poverty rate. These outcomes mean that international remittances, on average, lower the proportion of income (24 percent versus 33 percent) that must be transferred to the poor to raise their consumption expenditure to the absolute food poverty line. This poverty-reduction aspect of the remittances at the national level is also revealed through the severity index, which reduces from 18.8 percent to 12.5 percent for the non-remittances and remittances cases, respectively, reducing the severity of poverty among the poor by 33.1 percent (Table 4).

The national figures, however, mask the significant geographical differences in household poverty rates and the poverty-reduction effects due to international remittances. One level at which these differences are demonstrated is between rural and urban areas, which have prevalent and much milder poverty rates, respectively. Specifically, Table 4 shows that the incidence, depth, and severity of poverty for NRR and RR households in rural areas are estimated at 82.4 and 70.3 percent, 39.1 and 28.9 percent, and 22.3 and 14.9 percent, while in urban areas, the estimates were at 54.5 and 36.5 percent, 18.3 and 10.6 percent, and 8.3 and 4.2 percent, respectively. These estimates suggest that international remittances play a more important role in poverty reduction in urban than in rural areas. This is apparent when we compare the percent

reduction in rural incidence, depth, and severity of poverty, 14.7, 25.9, and 32.9 percent, respectively, with those of urban areas at 32.9, 41.8, and 49.4 percent, respectively, suggesting that the poverty-reduction effects of foreign remittances on the incidence, depth, and severity of poverty in urban areas are 2.2, 1.6, and 1.5 times as high compared to the rural areas, respectively. This suggests that at the urban-rural level, the direct benefits of foreign remittances fall mostly on urban households. However, this conclusion is reversed when the poverty decomposition method is based on the household sample for LGAs, for which foreign remittances have the most impact in rural than urban settings and with much disparity. For example, the highest reduction in the incidence of poverty (67.9 percent in the rural and remote LGA of Basse exceeded the lowest (9.4 percent in the urbanized LGA of Kanifing) by a factor of seven, with an average reduction of 26.1 percent across the eight LGAs. This pattern of foreign remittances having the most negative impact on the incidence of poverty in rural areas is also revealed for the depth and severity of poverty. Specifically, the reduction in the depth and severity of poverty ranged from 70.9 and 68.2 and 64.9 and 71.3 percent for Basse and Janjanbureh, respectively, to 32.1 and 39.1 and 18.3 and 25.6 percent for Banjul and Kanifing, respectively, with the average reduction in the depth and severity of poverty across the eight LGAs at 35.4 and 40.9 percent, respectively). The considerable decline in poverty observed in the rural LGAs is due partly to the remittances being a large proportion of household income. These results, coupled with those reported above, reveal the importance of foreign remittances in significantly reducing the poverty levels of many Gambian households, and making their poverty less severe. However, the extent of these effects and which households benefit more than the others are unevenly distributed across space. This suggests that the process by which remittances reduce poverty is complex, with various factors at work.

Table 4: FGT poverty decomposition: The effect of international remittances on the level of household poverty in the Gambia, 2015

		Without Remittances (1)	With remittances (2)	% change in FGT (3)
National	Headcount ratio	0.7550835	0.6288416	-16.71893241
	Poverty gap ratio	0.3394467	0.2492519	-26.57112295
	Severity ratio	0.1881617	0.1258241	-33.12980272
Rural	Headcount ratio	0.8249874	0.7035913	-14.71490352
	Poverty gap ratio	0.3913473	0.289673	-25.98058042
	Severity ratio	0.223083	0.1495603	-32.95755391

Urban	Headcount ratio	0.5453718	0.3654189	-32.99637055	Table 4...
	Poverty gap ratio	0.1837447	0.1068052	-41.8730445	
	Severity ratio	0.0833979	0.0421762	-49.42774338	
Banjul	Headcount ratio	0.7191938	0.5677419	-21.05856586	
	Poverty gap ratio	0.3184712	0.2163866	-32.05457825	
	Severity ratio	0.1757544	0.1069184	-39.16601803	
Kanifing	Headcount ratio	0.7687198	0.6967871	-9.357466791	
	Poverty gap ratio	0.354489	0.2896497	-18.29092017	
	Severity ratio	0.1993637	0.1483236	-25.60150118	
Brikama	Headcount ratio	0.8274535	0.7420925	-10.3161084	
	Poverty gap ratio	0.407474	0.3190071	-21.71105396	
	Severity ratio	0.2386153	0.1694564	-28.98343065	
Mansakonko	Headcount ratio	0.8094413	0.6635838	-18.01952779	
	Poverty gap ratio	0.3537575	0.2493705	-29.50806697	
	Severity ratio	0.1890337	0.1211206	-35.92645121	
Kerewan	Headcount ratio	0.7543175	0.6232617	-17.37408982	
	Poverty gap ratio	0.3244332	0.2345372	-27.70863155	
	Severity ratio	0.1757704	0.1138101	-35.25070205	
Kuntaur	Headcount ratio	0.7927711	0.7124756	-10.12845953	
	Poverty gap ratio	0.3696348	0.3036439	-17.85299977	
	Severity ratio	0.2094932	0.1604361	-23.41703693	
Janjanbureh	Headcount ratio	0.4095238	0.1862069	-54.5308722	
	Poverty gap ratio	0.1167951	0.0408926	-64.98774349	
	Severity ratio	0.0461213	0.0131993	-71.38133574	
Basse	Headcount ratio	0.3427762	0.11	-67.90909054	
	Poverty gap ratio	0.0973704	0.0283302	-70.90471026	
	Severity ratio	0.0402745	0.0127836	-68.25882382	

Results of the PSM Method: Material Welfare

We turn next to the results involving the use of the PSM methods. As already discussed, the appropriateness of using this method depends crucially on the validity of the conditional independence (CIA) and the common (balancing) or support (overlap condition) (CBA) assumptions (Becker and Ichino (2002)). Thus, conducting some diagnostic tests to establish whether these conditions are satisfied is necessary. As explained earlier, the CIA maintains that the selection into the treatment group is based on observable characteristics such as age, gender, and marital status but does not account for the household member's level of motivation, ambition,

and other unobservable skills that may play an important role in the migration selection process. Unfortunately, this assumption is unavoidable because of the unavailability of data on the latter skills, and thus, it cannot be validated empirically. However, we informally tested for it by estimating our probit models and examining whether it fits the data well. Indeed, as explained below, this is the case, and we take the results of this test as supportive of the CIA.

The second assumption (CBA) requires that there are "control" households with very similar observable characteristics (based on the PS) as the "treatment" households, allowing us to compare and match them. The `psmatch2` Stata 17 program used for our estimations allows us to test whether this balancing property is satisfied. Specifically, the program selects a region of common support based on the estimated PS (Rosenbaum and Rubin (1983) and Becker and Ichino (2002)). In this region, the treated and control households are similar regarding the various characteristics except for remittances, thus allowing us to credit any differences in the outcome variables measuring material and subjective household welfare to international remittances. For the households in the national sample, the PS in the region ranged between 0.048 and 0.941, and households falling outside this range were excluded, leaving 13,206 households for our analysis at the national level^{xiv}.

Also, in the case of the national sample, the `psmatch2` program classifies each household into 12 blocks, ensuring that the mean PS is not different for the "treated" and "control" households in each block. The program then implements a standardized test for percentage bias and equality of means to determine whether the RR and NRR households are identical on average, hence confirming the CBA. Good matching requires that the t-statistic after matching be insignificant so as not to reject the null hypothesis that the mean of each exogenous variable remains the same between treated and control households after matching.

Our balancing test results are similar for each of the three Matching methods employed, and thus, we report only those for the kernel matching, which, as previously explained, may be advantageous because it allows the use of all data from the controlled groups and is likely more consistent and efficient when the data to be compared are large and asymptotically distributed as in our case (e.g., Thapa and Acharya (2017)). Table 5 shows the bias before and after the matching and the percentage reduction for each exogenous variable. Except for the local youth unemployment rate variable (LGATUNEMPR), for which the differences between the treated and control groups are not removed, for all other variables, the percentage of bias reduction after the matching ranges between 61 and 99 percent. Consistent with these results is that the t-test results in the table for each variable are not significant after the matching (M). Thus, these results indicate that the balancing property satisfies all 13,206 households in our final national sample.

Table 5: Balancing Test Results for the Propensity Score Matching: Kernel Matching

Variable	Unmatched		Mean		% reduction		t-test
	Matched	Treated	Control	%bias	bias	t	
HHHAGE	U	49.668	47.394	15.4		7.87	
	M	49.668	49.961	-2	87.1	-0.76	
HHHAGESQ	U	2711.8	2438.1	17.6		9.08	
	M	2711.8	2740.8	-1.9	89.4	-0.69	
HHHMALE	U	0.77863	0.87165	-24.7		-12.9	
	M	0.77863	0.78827	-2.6	89.6	-0.94	
HHSIZE	U	8.4391	7.8085	11.1		5.88	
	M	8.4391	8.5658	-2.2	79.9	-0.82	
NUMHHPRI	U	1.6027	1.3933	12.1		6.19	
	M	1.6027	1.6141	-0.7	94.6	-0.25	
HHSAVEDUM	U	0.40651	0.3324	15.4		7.71	
	M	0.40651	0.41031	-0.8	94.9	-0.31	
HHLSTOCK	U	0.73319	0.71454	4.2		2.06	
	M	0.73319	0.72595	1.6	61.2	0.66	
ENTERDUM	U	0.15812	0.19821	-10.5		-5	
	M	0.15812	0.16155	-0.9	91.5	-0.38	
LGAHHCRI5	U	10.657	10.415	10.8		5.23	
	M	10.657	10.653	0.2	98.4	0.07	
CRIMEDUM2	U	0.63003	0.70952	-17		-8.5	
	M	0.63003	0.63559	-1.2	93	-0.47	
HHDEPRATIO	U	1.0974	1.1549	-6.7		-3.29	
	M	1.0974	1.1062	-1	84.7	-0.41	
HHROOMS	U	4.7258	4.1241	20		10.4	
	M	4.7258	4.7835	-1.9	90.4	-0.67	
LGAYUNEMPR	U	1.7287	1.7465	-0.8		-0.42	
	M	1.7287	1.6952	1.6	-87.5	0.62	
REGION2	U	0.0436	0.02794	8.4		4.42	
	M	0.0436	0.03835	2.8	66.5	1.07	
REGION3	U	0.17286	0.23721	-16		-7.6	
	M	0.17286	0.17924	-1.6	90.1	-0.68	
REGION5	U	0.14799	0.18334	-9.5		-4.62	
	M	0.14799	0.15158	-1	89.9	-0.41	
REGION6	U	0.05434	0.13901	-28.9		-13	
	M	0.05434	0.05508	-0.3	99.1	-0.13	
REGION7	U	0.07584	0.14263	-21.5		-10	
	M	0.07584	0.08029	-1.4	93.3	-0.67	

Source: Author's calculations based on GIHS 2015 data

We further tested the validity of the balancing property by using the graphical method (Figure 1). The top half of this figure displays the propensity score density distribution for the treated households, while the bottom half displays that for the control or untreated households. It is apparent from the figure that significant overlapping of the two distributions exists, indicating that there are "control" households with very similar observable characteristics (based on the PS) as the "treatment" households, allowing us to compare and match them. Therefore, we confirm a good quality match based on the balancing test results and validate the common (balancing) support (overlap) condition. This conclusion, coupled with the findings of the CIA, indicates that the PSM can be justifiably employed for this study and, thus, enhance our empirical results' credibility and reliability.

We turn now to the application of PSM. In the first stage, we estimated a probit model to determine the probability of receiving international remittances for each of our three household samples (national, urban, and rural) in which the dependent variable is TREATDUM (D), and the explanatory variables include a set of previously discussed individual head of household characteristics such as age, gender, and marital status; a group of household characteristics such as household size, the number of rooms occupied, livestock ownership, and the proportion of the elderly and the young in the household; and some economic and social characteristics such as the local government area youth unemployment and crime rates, and the dummy variables for the different regions (LGAs).

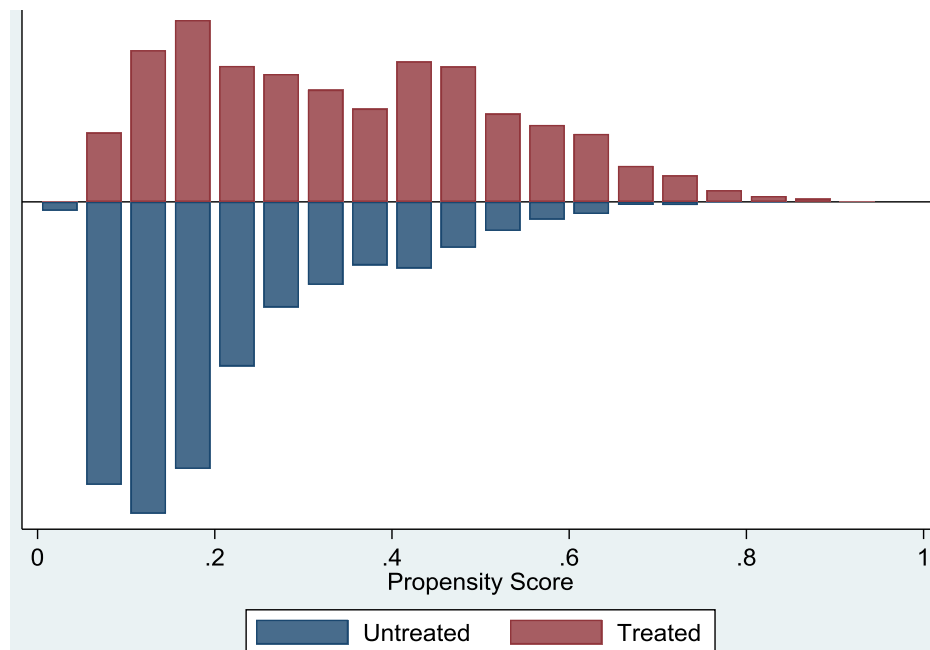


Figure 1: Checking for common support; source: Stata 17 output

The final version of the models used for the analysis is determined by the specification that satisfies the above balancing property. The estimated parameters of these models are used later to calculate households' propensity scores, the basis for predicting the probability of each household receiving remittances given the mentioned characteristics. However, for a more straightforward and meaningful interpretation of the results, we also used the probit estimated parameters to calculate marginal effects at the mean of each of the explanatory variables, and the results for the national, urban, and rural samples are reported in Table 6. These results indicate that many of the explanatory variables considered (15 out of 18, 15 out of 19, and 14 out of 18 for the national, urban, and rural samples, respectively) are statistically significant, most of which are at the 1 percent level. The overall goodness of fit as measured by the pseudo R^2 is satisfactory at below 0.20, consistent with those of previous studies of this nature (e.g., Clement (2011), Iqbal (2013), and Hua et al. (2022)). Importantly, Table 6 shows how, for example, a one percentage change in an explanatory variable affects the probability of the household receiving international remittances, all else equal. Using such interpretation, the results in Table 6 show how a one percentage change in an explanatory variable affects the probability of the household receiving international remittances, all else equal. Using such interpretation, the results in Table 6 suggest several conclusions, including the following:

- (1) The head of household's age (HHHAGE) and its square are highly significant at the one percent level in the national, urban, and rural samples and display a nonlinear relationship in which the probability of receiving remittances at first decreases with age and then rises afterward. We estimate this turning point age as 39 years, 45 years, and 36 years for the three samples, respectively, and are below the national average of 48 years^{xv}. Suppose the age of the head of household correlates with the ages of other members of the household, and the children and other younger members of the day potentially become migrants of tomorrow. In that case, the estimated turning point years may be seen as thresholds signaling when, on average, the transition to migrant status occurs in the said samples, with a resulting increase in the probability of receiving remittances. This makes sense since normally a head of household aged 39 may not have a grown child to be in at the diaspora remitting money back home.
- (2) The head of household's gender plays an important role in receiving international remittances. Specifically, households headed by a male (HHHMALE) have a probability of receiving remittances 13% lower than their female counterpart at the national, urban, and rural levels. This outcome is likely if, in the absence of the migrants, most of whom are male, there is an increase in the household's ratio of females, who are likely to receive the remittances.

- (3) A larger household size (HHSIZE) lowers the probability of remittances, but it is statistically significant only for urban households, suggesting that small households are likely to receive remittances more frequently than larger families in urban areas.
- (4) Education increases the probability of receiving remittances but only when measured by the number of household members with Tertiary education (NUMHHTER) in urban and rural areas, where it increases the probability by 2.5% and 2.8% than households with lower levels of education. The reason for this outcome might relate to the relatively large high-skilled professional component of the migrant population alluded to earlier. Specifically, migrants with such skills are likely to earn more and, thus, send relatively more remittances back home than lower-educated and low-skilled migrants. It could also be that tertiary education is a proxy for wealth (Andersson (2014)) and thus, the higher-educated migrants can more easily embark on international migration, which is costly.
- (5) The number of rooms occupied by the household positively impacts the probability of receiving remittances, but more so in urban areas where this probability increases by 2.8% per room. This may be so because RR households have the financial ability to acquire more properties than NRR including houses and, thus, the former are likely to occupy more rooms than the latter.
- (6) Having a savings account has a positive effect on the probability of receiving remittances, with this effect higher for urban (11.3%) than rural (6.7%) households. This outcome may suggest that urban RR households are saving from remittance income and directing remittances to human capital and other productive investments more so than their rural counterparts. These investments are crucial for enhancing household welfare and developing the Gambian economy. This conclusion is in accord with the findings of Jawara (2020) that Gambian household access to formal savings per se improves household well-being.
- (7) Homeownership (HOWNER) enhances the probability of remittances, but only for households in urban areas where the increase is 7%. The fact that urban households can more readily use their homes as collateral for obtaining loans to subsidize at least part of the migration process, ultimately leading to more migrants and remittances, may be to blame.
- (8) Operating a non-agricultural enterprise (ENTERDUM) reduces the household's probability of receiving remittances, lowering it by 5%, 4%, and 3% at the national, urban, and rural levels, respectively. This outcome would be expected if involvement in such enterprises generates higher income and, thus, reduces the need for remittances as a source of income.

- (9) The household dependency ratio (the percentage of household members under 15 years and 64 years and older) (HHDEPRATIO) increases the probability of receiving remittances only in rural areas where it is statistically significant only at the 10% level. In these areas, a strong need to care for the dependents motivates adults to migrate, increasing the chances of receiving remittances.
- (10) Households living in urban areas are more likely to receive international remittances than those living in rural areas. However, this observation must be tempered by the fact that many rural RR households migrate to urban areas for easy access to basic social amenities (e.g., water and electricity) most especially in the Kanifing and Brikama LGAs. Thus, they will now be counted among urban RR households.
- (11) The probability of receiving remittances for households varies across LGAs. However, this factor contributes positively to this probability only in Kanifing but negatively in all other LGAs.

Table 6: Marginal effects from Probit models for remittance receiving

	National households	Urban households	Rural households
	Marginal Effects: dy/dx	Marginal Effects: dy/dx	Marginal Effects: dy/dx
HHHAGE	-0.0064151*** (-0.00139)	-0.0081611*** (0.00301)	-0.0052116*** (0.00155)
HHHAGESQ	0.0000807*** (-0.00001)	0.0000896*** (0.00003)	0.000071*** (0.00001)
HHHMALE	-0.1329713*** (-0.00927)	-0.1399893*** (0.01668)	-0.1224403*** (0.01125)
HHSIZE	-0.0005479 (-0.00095)	-0.0103592*** (0.00271)	0.0004377 (0.00100)
NUMHHPRI	0.0008623 (-0.00236)	0.0057812 (0.00632)	0.0024365 (0.0025138)
NUMHHTER		0.0256797*** (0.01185)	0.0283318** (0.01265)
HHSAVEDUM	0.0866875*** (-0.00767)	0.1133956*** (0.01509)	0.0678634*** (0.00916)
HHLSTOCK	0.0044218 (-0.00913)	0.0360605** (0.01816)	0.00569 (0.01202)
HHOWNER		0.0710862*** (0.01824)	-0.0134439 (0.01416)

ENTERDUM	-0.0509415*** (-0.0093)	-0.0476514** (0.02013)	-0.0380457*** (0.01073)
LGAHHCRIME5	0.0517732*** (-0.00247)	0.0189811** (0.00768)	0.0598988*** (0.00269)
CRIMEDUM2	-0.013276* (-0.00789)	-0.0154652 (0.01753)	-0.0151462* (0.00877)
HHDEPRATIO	0.0048451 (-0.00406)	-0.0093006 (0.00859)	0.0079804* (0.00456)
HHROOMS	0.0173665*** (-0.00162)	0.0285678*** (0.00407)	0.0136448*** (0.00177)
HHURBAN	0.0364604*** (0.00998)		
LGAYUNEMPR	-0.0197865*** (-0.00355)	-0.0014682 (0.00376)	-0.143277*** (0.00462)
REGION2	0.0609242** (-0.03126)		
REGION3	-0.3619424*** (-0.01664)	-0.1736204*** (0.0340606)	
REGION5	-0.2520387*** (-0.01048)	-0.1974654*** (0.02647)	-0.2029713*** (0.01070)
REGION6	-0.2481166*** (-0.01362)	-0.2735834*** (0.05402)	-0.2947699*** (0.01349)
REGION7	-0.1855152*** (-0.01284)	-0.1484629*** (0.03335)	-0.2144558*** (0.01390)
Pseudo R ²	0.120	0.100	0.140
Observations	13,206	3,322	9,884

Table 6...

Notes: Standard errors in parentheses. *, ** and *** represent 10%, 5% and 1% levels of statistical significance, respectively. Source: Authors' computation using Stata 17.

We turn next to the average treatment effects on the treated (ATET), which measures the average effects of the remittances on the RR households starting with the previously mentioned poverty lines, focusing on the Kernel results for previously mentioned reasons. Table 7 reports the results of the ATET for the national, urban, and rural samples. The first set of results in Panel A of the table focuses on the outcome variable, HHAFPOVLINE, a dummy variable coded as one if the household is below the annual food poverty line of GMD 11,794.66. These results are statistically significant at the 1 percent level, have the expected negative sign, and suggest that international remittances are a key factor in reducing the probability of

households falling below the annual food poverty line. Specifically, for the national, urban, and rural household samples, these remittances, on average, reduce the probability of being in poverty based on the kernel matching method by 11.6%, 9.8%, and 12.9%, respectively, indicating that the level of poverty among households receiving remittances is significantly lower than that of similar households not receiving them. These findings that international remittances have a significant poverty-reducing effect are in accord with those reported above and from many studies of other countries or regions, including Akeju et al (2018) for the ECOWAS region; Acosta (2008) for Latin American countries; Iqbal (2013) for Pakistan; and Adams (1991) for Egypt.

The estimated results of the ATET for the three household samples when the poverty outcome variable is coded as one if the household is below the annual absolute (food and non-food) poverty line (HHAFNFPOVLINE) of GMD 18,039.95 are reported in Panel B of Table 7. As in the case of the food poverty line, the results for the absolute poverty line are also statistically significant at the 1 percent level and have the expected negative sign. Specifically, the results show that, on average, there is an 8.7%, 9.9%, and 9.1% less probability of falling below the absolute poverty line for RR households in the national, urban, and rural households samples, respectively. These results confirm our previous findings of the poverty-reducing effects of international remittances. Thus, international remittances are crucial in reducing both the food poor and absolute poor levels in The Gambia, and almost equally so as the percentage reductions are comparable. In other words, remittances are necessary for more households to live above the annual food and absolute poverty lines.

Table 7: Average treatment effects of international remittances
on objective welfare of Gambian households

Panel A: Outcome variable: Household Annual Food Poverty Line (GMD 11,794.66)						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-Stat.	ATT	t-stat.	ATT	t-stat.
Total sample	-.116	-10.3***	-.126	-13.3***	-.114	-9.30***
Urban households	-.098	-4.82***	-.106	-6.90***	-.100	-4.52***
Rural households	-.129	-9.80***	-.122	-11.5***	-.131	-9.20***
Panel B: Outcome variable: Household Annual Absolute (food and non-food) Poverty Line (GMD 18,039.95)						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-Stat.	ATT	t-stat.	ATT	t-stat.
Total sample	-.087	-8.70***	-.099	-11.3***	-.085	-7.70***
Urban households	-.099	-4.59***	-.096	-5.72***	-.110	-4.67***
Rural households	-.091	-8.22***	-.089	-9.74***	-.094	-8.00***

Panel C: Outcome variable: Household Annual Food Expenditure Per Capita						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-Stat.	ATT	t-stat.	ATT	t-stat.
Total sample	2415	9.23***	2682	11.78***	2452	8.85***
Urban households	2862	4.20***	3273	5.67***	2875	3.99***
Rural households	2261	9.40***	2224	11.47***	2219	8.46

Panel D: Outcome variable: household Annual Food and non-food Expenditure Per Capita						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-Stat.	ATT	t-stat.	ATT	t-stat.
Total sample	2689	8.86***	2935	11.15***	2613	8.05***
Urban households	3351	4.21***	3573	5.35***	3772	4.47***
Rural households	2544	9.39***	2385	10.93***	2493	8.49***

To further examine the effects of international remittances on related aspects of material welfare across national, urban, and rural Gambian households, we estimated the ATET when the outcome variable is, first, the household annual food expenditure per capita (HHAFEXPENDPC) and the results are reported in Panel C of Table 7. These results are statistically significant at the 1 percent level and have the expected positive sign in all the cases considered, thus indicating that international remittances have a significant and positive impact on household annual food expenditure per capita, all else equal. Specifically, when we express the treatment effect amount as a percentage of the annual food expenditure per capita of households not receiving remittances (GMD 11,400), these remittances increase such per capita expenditure by 21.1% (GMD 2,415), 25.1% (GMD 2,862), and 19.8% (GMD 2,261) in the national, urban, and rural household samples compared to such expenditure for similar households that do not receive remittances.

Finally, the ATET results for the effects of international remittances on household annual food and nonfood expenditure per capita (HHAFNFEXPENDPC) are reported in Panel D of Table 7. These results are positive and statistically significant at the 1% level for the three household samples. Specifically, when we express the treatment effect amount as a percentage of the annual food and nonfood expenditure per capita of households not receiving remittances (GMD 21,491), the remittances increase the HHAFNFEXPENDPC by 12.5% (GMD 2,689), 15.6% (GMD 3,351), and 11.8% (GMD 2,544) in the national, urban, and rural household samples, respectively, compared to such expenditure for similar households without remittances.

We pursue our analysis further by calculating the ATET of international remittances on the material welfare of households at the regional level as represented by the LGAs. These results, based on the three matching methods, are reported in Table 8. The results in Panel A of this table allow us to address the issue of whether international remittances lower the probability of LGA households falling below the annual food poverty line of GMD 11,794.66 and, if so, the size of the reduction. Based on the kernel matching method, the results indicate that the remittances significantly reduce the probability of households falling below the said poverty line in all LGAs except for the hinterland Basse, where the reduction lacks statistical significance. For the remaining seven LGAs, the results, at the low end, indicate a 7 percent less probability of being in food poverty for the LGA households in Mansakonko but a 15.9 percent less probability at the upper end in Brikama. The results relating to how the remittances affect the probability of being in absolute poverty based on the annual poverty line of GMD 18,039.95 are presented in Panel B of Table 8. These results show that the remittances reduce this probability in all LGAs except Basse and Janjanbureh, where the reduction is not statistically significant. Specifically, there is a 7.5 percent less probability of absolute poverty for LGA households in Kerewan compared to a 16.8 percent reduction in Brikama.

Table 8: Average treatment effects of international remittances
on objective welfare of Gambian households

Panel A: Outcome variable: Household Annual Food Poverty Line (GMD 11,794.66)						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-Stat.	ATT	t-stat.	ATT	t-stat.
Banjul	-.136	-5.47***	-.100	-6.61***	-.118	-4.49***
Kanifing	-.083	-2.32***	-.020	-.065	-.080	-2.10***
Brikama	-.159	-3.82***	-.158	-4.22***	-.154	-3.44***
Mansakonko	-.070	-2.65***	-.092	-4.07***	-.073	-2.55***
Kerewan	-.139	-4.92***	-.138	-5.83***	-.137	-4.43***
Kuntaur	-.102	-4.25***	-.107	-5.07***	-.095	-3.68***
Janjanbureh	-.101	-1.67*	-.140	-4.52***	-.103	-1.74*
Basse	-.019	0.29	-.095	-2.57***	.062	0.69
Panel B: Outcome variable: Household Annual Absolute (food & non-food) Poverty Line (GMD 18,039.95)						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-Stat.	ATT	t-stat.	ATT	t-stat.
Banjul	-.094	-4.18***	-.054	-3.85***	-.092	-3.92***
Kanifing	-.079	-2.49***	-.037	-1.31	-.080	-2.36***
Brikama	-.168	-4.39***	-.165	-4.66***	-.157	-3.89***

Table 8...

Mansakonko	-0.079	-3.52***	-0.081	-4.04***	-0.087	-3.63***
Kerewan	-0.075	-2.92***	-0.084	-3.83***	-0.071	-2.53***
Kuntaur	-0.088	-4.13***	-0.089	-4.63***	-0.084	-3.64***
Janjanbureh	-0.028	-0.420	-0.108	-2.71***	-0.033	-0.50
Basse	-0.066	-0.87	-0.063	-1.39	0.00	0.00

Panel C: Outcome variable: Household Annual Food Expenditure Per Capita

	Kernel		Radius		Nearest Neighbor	
	ATT	t-Stat.	ATT	t-stat.	ATT	t-stat.
Banjul	2475	4.26***	1181	3.73***	2302	4.34***
Kanifing	3017	3.02***	1722	1.85*	2932	2.82***
Brikama	3393	3.73***	3559	4.21***	3713	3.95***
Mansakonko	1911	2.92***	2139	3.51***	2079	3.02***
Kerewan	2041	3.47***	2147	4.27***	1559	2.46***
Kuntaur	2033	3.89***	2127	4.58***	1993	3.52***
Janjanbureh	-906	-0.41	6776	4.34***	1530	0.70
Basse	1716	0.83	3205	2.39***	1002	0.48

Panel D: Outcome variable: household Annual Food and non-food Expenditure Per Capita

	Kernel		Radius		Nearest Neighbor	
	ATT	t-Stat.	ATT	t-stat.	ATT	t-stat.
Banjul	2645	4.03***	884	2.49***	2462	4.01***
Kanifing	3276	3.07***	1803	1.83	2770	2.46***
Brikama	4030	3.60***	4259	4.07***	4397	3.84***
Mansakonko	2374	3.2***4	2543	3.73***	2527	3.27***
Kerewan	2363	3.48***	2452	4.27***	1879	2.58***
Kuntaur	2549	4.09***	2588	4.69***	2467	3.60***
Janjanbureh	-940	-0.35	7011	3.85***	1675	0.64
Basse	2227	0.88	3541	2.10***	1103	0.43

Panel C of Table 8 shows the results of the impact of international remittances on the annual food expenditure per capita across the LGAs. The remittances have a positive and statistically significant impact on such expenditure in all LGAs except Janjanbureh and Basse, where the impact is negative and positive but statistically insignificant, respectively. Specifically, receiving international remittances increases household annual food expenditure per capita, ranging from GMD 1,912 in Mansalonko to GMD 3,393 in Brikama.

Finally, Panel D of Table 8 shows the impact of the remittances on the annual food and nonfood expenditure per capita. The impact is positive and statistically significant in all LGAs

except Janjanbureh, which is negative and statistically insignificant. In this case, receiving the remittances increases household annual food and nonfood expenditure per capita, ranging from GMD 2,363 in Kerewan to GMD 4,030 in Brikama.

Results of the PSM Method: Subjective Welfare

We turn next to the PSM results relating to the effects of international remittances on Gambian subjective household welfare. As discussed earlier, subjective welfare focuses on the households' self-declared or subjective assessments of various aspects of their well-being. Table 9 reports the national, urban, and rural household sample results using the three matching methods. We continue to focus on the Kernel method results for reasons explained earlier. As seen from the table, the impact of the remittances on subjective welfare has the same sign (positive or negative) in the total (national) and rural samples for each of the outcome variables (the nine measures of subjective welfare), while the sign for the urban sample is different from the two samples in six of the nine measures. Importantly, the results show that the effects of international remittances on subjective welfare are statistically significant at the highest level of 1% for each of the nine measures of such welfare for the national and rural samples. However, statistical significance in the urban sample is achieved when only the subjective welfare measure is "*Community living standard improved during last 12 months*," where RR households are 3.3% less likely to make such assertion. This finding means that, for the urban sample, there are no differences in the subjective welfare levels between RR and similar NRR households in eight of the nine measures of such welfare. This finding is consistent with Borraz et al. (2010) for Ecuador.

Panel A of Table 9 shows that RR households in the national and rural samples are more likely to feel that their livelihood is rich based on their income than similar NRR households; however, the probability of such an outcome increases by only 1%. Nevertheless, this outcome is consistent with the results showing that RR households in the national and rural samples are 6.9% and 7.3% (Panel B, Table 9) less likely to feel that their livelihood is poor based on their income than similar NRR households. Panel C (Table 9) shows that RR households in the national and rural samples have a higher probability (3.3% and 4.8%, respectively) of declaring that their living standard improved during the last 12 months than NRR households and also more likely (1% and 1.1%, respectively) to feel that their living standard is rich relative to other households (Panel D, Table 9). The latter outcome is consistent with the results in Panel E (Table 9), indicating that national and rural households with remittances are 4.1% and 6.1%, respectively, less likely to feel that their living standard is poor compared to other households. Furthermore, they are 4.5% and 7.3% more likely to report that their

community living standard improved during the last 12 months (Panel F, Table 9). Also, RR households in the national and rural samples are 5.9% and 8%, respectively, less likely to report poor financial situation than NRR households (Panel H, Table 9). Finally, RR households in the national and rural samples are 2% and 2.3% more likely to believe that poverty reduction is a government priority (Panel I, Table 9) and, perhaps less likely to protest or demand for the government to fight poverty, or more likely to favor current government poverty alleviation programs^{xvi}.

Table 9: Subjective welfare: Impact of international remittances on Gambian households' perception of welfare and the resolve of government to reduce poverty

Panel A: Outcome variable: HH livelihood rich based on income						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.
Total sample	0.01	2.46***	0.01	1.6	0.006	1.63
Urban households	-0.005	-0.47	-0.003	-0.42	-0.04	-0.6
Rural households	0.011	3.1***	0.01	2.01**	0.01	1.7
Panel B: Outcome variable: HH livelihood poor based on income						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.
Total sample	-0.069	-6.36***	-0.008	-0.076	-0.01	-0.96
Urban households	-0.019	-1.16	-0.006	-0.36	-0.117	-0.51
Rural households	-0.073	-6.92***	-0.007	-0.073	-0.01	-0.54
Panel C: Outcome variable: HH living standard improved during last 12 months						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.
Total sample	0.033	4.1***	0.027	2.84***	0.027	2.59***
Urban households	-0.005	-0.34	0.013	0.72	0.009	0.49
Rural households	0.048	5.11***	0.02	1.71	0.022	1.82*
Panel D: Outcome variable: HH living standard rich relative to other households						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.
Total sample	0.01	2.49***	0.01	1.9*	0.01	1.7
Urban households	-0.001	-0.01	0.001	0.22	0.004	0.05
Rural households	0.011	2.91***	0.01	2.07**	0.005	1.41
Panel E: Outcome variable: HH living standard poor relative to other households						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.

Table 9...

	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.
Total sample	-0.041	-4.31***	-0.002	-0.2	-0.002	-0.14
Urban households	0.014	0.9	0.025	1.17	0.017	0.73
Rural households	-0.061	-5.64***	-0.01	-0.51	-0.008	-0.57
Panel F: Outcome variable: Community living standard improved during last 12 months						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.
Total sample	0.045	5.39***	0.029	2.92***	0.031	2.88***
Urban households	-0.033	-2.54***	-0.023	-1.34	-0.031	-1.6
Rural households	0.075	7.64***	0.027	2.24**	0.025	1.9*
Panel G: Outcome variable: HH financial situation rich						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.
Total sample	0.01	1.8*	0.002	0.54	0.0001	0
Urban households	0.002	0.27	-0.004	-0.06	0.002	0.35
Rural households	0.01	1.91**	0.01	1.6	0.01	1.29
Panel H: Outcome variable: HH financial situation poor						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.
Total sample	-0.059	-6.24***	-0.014	-1.34	-0.016	-1.32
Urban households	-0.011	-0.66	-0.003	-0.12	-0.01	-0.39
Rural households	-0.08	-7.09***	-0.015	-1.13	-0.014	-1.28
Panel I: Outcome variable: Poverty reduction is a government priority						
	Kernel		Radius		Nearest Neighbor	
	ATT	t-stat.	ATT	t-Stat.	ATT	t-stat.
Total sample	0.02	3.07	0.007	1.14	0.008	1.21
Urban households	-0.001	-0.08	-0.01	-0.04	0.004	0.27
Rural households	0.023	3.94	0.011	1.43	0.01	1.17

To summarize, our investigation of the effects of international remittances on Gambian migrant households' subjective welfare reveals two key findings. First, these remittances positively impact such welfare in the national and rural samples. This finding confirms the results of key studies on the issue, for example, Semyonov and Gorodzeisky (2008), Andersson (2014), Borci and Gavoci (2015), Joarder et al. (2017), and Biyase et al. (2021), on the Philippines, Ethiopia, Albania, Bangladesh, and South Africa, respectively. The second finding indicates that no differences in subjective welfare levels exist between the RR and NNR

households in the urban sample for eight of the nine measures of such welfare employed. This finding is consistent with that of Ecuador, reported by Borraz et al. (2010), whose explanation for the finding is that the remittances fully compensate the households left behind for the costs imposed on them by migration. While this explanation is plausible and, thus, invoked to explain our results for the urban sample, it is important to note a distinguishing factor between our study and the key studies cited above and Borraz et al. (2010) regarding the level of aggregation of the measure of subjective welfare. Specifically, the latter study's measure is quite aggregate, focusing essentially on respondents perception of their well-being by examining whether they were "very satisfied," "fairly satisfied," "not satisfied," or "very unsatisfied" with their life to determine whether the households are "happy" or "unhappy." In this study, we acknowledge that subjective welfare is multi-dimensional and, thus, has many sources. Accordingly, we employed as many as nine measures. The implication is that how and to what extent the remittances affect the subjective welfare of households partially depends on the level of aggregation and the types of measures of such welfare employed.

CONCLUSION AND POLICY RECOMMENDATIONS

The major objectives of this paper were to examine the largely unexplored issue of how international migrants' remittances affect Gambian households' poverty levels and material and subjective welfare, using a nationally representative socioeconomic survey covering 13,281 households and applying poverty decomposition and propensity score matching methods to mitigate potential endogeneity problems. It finds evidence that these remittances have strong household poverty-reducing effects at virtually all geographical levels (national, rural, urban, and Local Government Areas (LGAs)), significantly improving both welfare types. For example, the FGT (1984) poverty decomposition results show that at the national level, the incidence, depth, and severity of poverty among the RR households are 16.7, 26.5, and 33.1 percent lower than of NRR households, respectively, along with an 11.6 and 8.7 percent lesser probability of falling below the food and the absolute poverty lines, and a 21.7 and 12.5 percent higher per capita food and total (food and nonfood) expenditure. Similar reductions and increases are observed at the other geographical levels with much variation.

Concerning subjective welfare, RR households in the national and rural samples, on average, rate their absolute and relative standard of living higher than similar NRR households and are significantly more likely to think that their community standard of living improved in the last 12 months and that their financial situation is rich. Also, the RR households are more inclined to believe that poverty reduction is a priority of the government and, perhaps, more

optimistic about the country's direction. Mostly, no differences in subjective welfare levels exist between the RR and similar NRR households in the urban sample.

Our findings indicate that international migrants' remittances can be a valuable tool for reducing household poverty's various dimensions (incidence, depth, and severity) and enhancing household welfare and socio-economic development in the Gambia. Thus, this study provides a rationale and legitimacy for government and private initiatives/strategies to facilitate remittance inflows, preferably through formal channels, and to improve their productive usage in poverty alleviation and socio-economic development in the Gambia. We briefly focus on three of the numerous strategies that are customarily suggested in the literature and quite pertinent in the Gambian context, namely, data collection enhancement and lowering the cost of transferring remittances, diaspora engagement, and entrepreneurship promotion (e.g., Lopez-Cordova and Olmedo (2006), Yoshino, Taghizadeh-Hesary, and Otusuka (2017), and OECD (2017)). First, the importance of accurate, timely, and accessible data on remittances for designing informed and effective poverty alleviation strategies can hardly be overstated, yet there is a distinct lack of such data for the Gambia and many other countries (Mckenzie and Saisin (2007) and Ratha (2013)). A first step to address this issue domestically is to establish a centralized/formalized data collection system that allows the monitoring and control of remittance transactions. This action will require subjecting all banking, financial and other remittance service providers to data reporting requirements and other procedures that the Central Bank and the government may prescribe. The success of these efforts will depend critically on a sound information and electronic information technology infrastructure created by, for example, the recently established Gambia Information and Communication Technology Agency. Also, the domestic efforts must be supplemented with foreign resources, such as the benefits from the Gambia's continued participation and capitalization of the various IMF's Special Data Dissemination Standards.

Second, the government and other stakeholders should aim at reducing the costs of transferring remittances, which will increase the resources of migrants and their families back home, the remittance inflows via formal channels, and financial access of the poor in the home country (Global Economic Prospects (2006)). There are, however, challenges involved because the costs are driven by complicated factors such as high sunk costs, stringent regulation restricting competition, lack of access to a public payment system, and country risks (e.g., political instability and exchange-rate risk) (Global Economic Prospects (2006)). Thus, a small and impoverished country like the Gambia would need assistance from capable and resourceful sources to be successful. Indeed, such sources, including the Migration and Sustainable Development in the Gambia (MSDG) project created in 2017 and the Financing Facility for Remittances (FFR) and the International Fund for Agricultural Development (IFAD), co-financed

by the European Union, among others, are making progress in laying the groundwork that should ultimately help in, among other things, reducing remittance transfer costs.

Third, increased recognition that diaspora members can play a key role in the socio-economic development of their countries of origin has spurred much interest in diaspora engagement policies. In the Gambia, this interest led to the creation of, for example, the Migration and Sustainable Development in the Gambia (MSDG) project in 2017, whose objectives include expanding and enhancing “diaspora participation in Gambian socio-economic development policy and practice through institutionalized engagement,” and capacity development of public institutions through diaspora-led Technical Cooperation Program” (MSDG, p. 1). One of the main mechanisms through which such engagement can be realized is the use of diaspora bonds issued by the government to borrow funds denominated in hard currencies (dollars, pounds, and euros) mainly from the country's diaspora and descendants to boost the financing of development projects (e.g., agriculture, education, transportation, and energy) as have been done successfully in countries such as Israel, India, and Mexico . There are important challenges in creating and implementing a diaspora bonds program in the Gambia, but the MSDG, the Commonwealth Diaspora Finance (CDF) project, and other stakeholders are making progress (see, for example, MSDG (2023) and Commonwealth Secretariat (2022)). Although much work remains to be done in this area, diaspora bonds could be a reliable, relatively cheap, and lucrative source of external finance for the Gambia if its diaspora's strong sense of loyalty, patriotism, and interest in participating in the country's development alluded to earlier are coupled with an environment of domestic political and financial stability and trust and confidence in government institutions. Also, the government can attract funds from the diaspora using "matching funds initiatives," whereby it contributes a dollar or more for every dollar diaspora members invest in projects in their communities back home. These initiatives have proven successful in many countries, including Mexico, where the funds have been effectively channeled to support the construction or improvement of paved roads, access to clean drinking water and electricity, and the building of schools.

Finally, another way of achieving diaspora engagement is for the government and other stakeholders to implement policies that will effectively take advantage of remittances and other resources (e.g., diaspora technical know-how) to promote business/entrepreneurial opportunities that will create jobs, raise income, and promote local developments as in countries such as India, Mexico, and Turkey, which have successfully integrated members of their diasporas into their home economies (Lopez-Cordova and Olmedo (2006)). Unfortunately, the Gambia has much work to do before fully exploiting the poverty-alleviating and development potentials of remittances and its diaspora. However, there is room for optimism, given the

progress being made by the MSDG, IFAD, CDF, and other stakeholders (MSDG (2022) and Commonwealth Secretariat (2022)).

SCOPE FOR FURTHER STUDIES

The current study focuses on international remittance inflows to The Gambia and their relationship with household poverty and welfare. Several related issues warrant future investigation. First, this study did not consider a factor that some recent studies have found important in reducing poverty: internal/domestic remittance inflows. Thus, a more holistic approach considering how such funds transfers mostly from urban to rural areas in the Gambia impact household poverty and welfare should provide additional insights. Second, a large literature already exists on whether the inflow of remittances leads to more or less inequality in income distribution. Such a study for the Gambia would be well worth it, for it may, among other things, provide important welfare policy implications. Finally, an equally important issue is how foreign remittances affect key macroeconomic indicators such as economic growth, savings, human capital investment, and labor productivity. Unfortunately, the large empirical literature on this issue has produced widely divergent results which support opposing views. Except for a few studies (e.g., Ceesay et al. (2019) and Ceesay (2020)), this important issue still needs to be addressed in the Gambian context. Thus, much research on this issue remains to be done.

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ⁱ This study defines a household to include "a person, or group of persons who live together in the same house or compound, share the same house-keeping arrangements, and are catered for as one at least six months preceding the interview" (the Gambian Integrated Household Survey (GIHS (2015, p. 14)).

ⁱⁱ Kafo groups help community members save money for charitable donations in emergencies; Osusu groups mobilize resources needed to start or expand a business or to finance family and community projects; and zakat are required payments Muslims make on certain types of property and are used for charitable and other purposes.

ⁱⁱⁱ We define international remittances as the total amount of cash and the value of goods received/collected in the last twelve months by the household from a household member living abroad (Africa and elsewhere) (GIHS (2015)).

^{iv} The increased recognition of the diaspora's importance in the said role is reflected by, for example, the Gambia's President Barrow recently recognizing it as the eighth region of the country and incorporating a Diaspora Strategy in the 2018-21 National Development Plan.

^v The increases in international remittances are well documented. For example, the estimates for officially recorded remittances received by all countries surged from \$192.2 billion in 2003 to \$781.1 billion in 2021, with the share going to the low- and middle-income countries increasing from 61% to 76% for these years, respectively (World Bank-KNOMAD (2022)).

^{vi} As is well-known, the officially estimated foreign remittances grossly underestimate the true amounts of these remittances as migrants, for various reasons, tend to send a significant amount through informal channels such as the black markets, local transfer agents, and families and friends, which are difficult to trace and monitor effectively (Fromentin (2018)).

^{vii} The cost of transferring remittances is inversely related to the amount remitted and is notoriously high, especially in African countries, where the average cost to and within these countries is 8.12% of the amount sent and higher than the global average of 6.67% (IFAD (2020)). For example, for the Gambia, the average transaction cost was around 20% of the amount sent in 2013, declining to just below 10% in 2017 (World Bank, World Development Indicators (2020)) but has gone up recently to 12.2% (IFAD (2020)), four times higher than the 3% target committed to by the 2015 Addis Ababa Action Agenda and Sustainable Development Goals.

^{viii} Estimates of the Gambian diaspora population hovered between 5.4% and 7.7% in 2019 and 2020. These are small compared to other Sub-Saharan African countries (Kebbeh (2013) and (2019)).

^{ix} The resilience of the inflow of international remittances to the Gambia was amply displayed during the Covid-19 pandemic period (2019-2020), when the inflow dropped significantly in many Sub-Saharan African countries but soared in a few of these countries, including the Gambia, Comoros, and Zimbabwe (IMF, African Department (2021)). Indeed, the Central Bank of the Gambia reported that the inflow through formal channels rose from US\$30 million per month in 2019 and the early part of 2020 to record highs of US\$67.6 million in the middle of 2020. Also, the International Monetary Fund reported that the record-high remittances more than compensated for the Gambia's decline in tourism revenue due to coronavirus-related travel restrictions (Joof (2021)). The resilience in the case of the Gambia has been explained by the fact that "...the halt of air travel, a strong channel of informal inflows, may have induced people to switch from informal to formal channels for the transmission of their funds, potentially overstating the overall increase in remittances" (IMF, African Department, p. 3, 2021). However, we maintain, consistent with anecdotal evidence, that the surge may have a lot to do with many of the factors mentioned already, such as the Gambian diaspora's patriotism, loyalty, and high propensity to give help in times of need.

^x For a description of the scope, coverage, sampling procedure and other technical aspects of the data, see the GIHS (2015).

^{xi} Of the 13281 households in the sample, 74.8% and 25.1% reside in rural and urban areas, respectively. It is noted that the proportion of households receiving the remittances varies widely across the country. For example, at the LGA district level, it ranges from Brikama (17.8%), Kerewan (18.2%), and Kuntaur (19.2%) to Kanifing (26.7%), Mansakonko (33.6%), and Basse (40.1%) (GIHS (2015)).

^{xii} The GIHS (2015) reports that for the national, urban, and rural samples, 81%, 89.5%, and 70.5% of the remittances of the RR households are from international sources, and the rest are from domestic (urban and rural) areas. Given their relative importance, this study focuses on international remittances' poverty and welfare effects.

^{xiii} In generating the data for the household annual food expenditure per capita, we dropped 15 households whose such expenditure was entered as zero and also those with "extremely high" food expenditures.

^{xiv} The probit model was also estimated separately for the urban and rural samples, with the PS in their regions of common support ranging from 0.063 to 0.863 and 0.039 to 0.931, respectively, leaving 3,322 and 9,884 households, respectively, for the analysis at the urban and rural levels after excluding the households that do not fall in these ranges. The discussion of the diagnostic tests focuses on the national sample, given that the urban and rural sample results indicate similar conclusions.

^{xv} These turning point years were estimated by dividing the coefficient of the Age variable by twice the absolute value of the coefficient of the age-squared variable (Wooldridge (2002)).

^{xvi} We also considered how the remittances affect subjective welfare at the LGA level. The results show much variation among the LGAs and are generally consistent with the results at the national, rural, and urban samples; however, they are largely statistically insignificant and, thus, are not reported here but are available upon request.