Remittances and Food Security: A Study of the Global South

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Abstract

Since 2000, the number of international migrants has increased steadily, reaching 258 million in 2017. More than one-third of international migration moves from South to North, basically from developing to developed countries. Like international migration but in opposite direction, flows of remittances have also increased largely to developing countries since 2000. International remittances flow into developing countries attract increasing attention because of their rise in volume and their impact on the recipient countries. Receiving remittances from outside the country has become a household coping strategy that might contribute to poverty reduction, to alleviate hunger, to promote better diets and to increase productive investments.

Because little is known about the topic, the main purpose of this study was to investigate the linkage between receiving remittances and the food security status in Global South (GS) regions. Although there are some studies on different countries that explore the association between receiving remittances and household food quality and quantity consumption or food consumption expenditures, this is the first study that examines the association between food security and receiving remittances by using the Food Insecurity Experience Scale (FIES) for individuals in the Global South (GS).

Data were obtained from the 2017 Gallup World Poll (GWP), which interviewed face-to-face 68,463 individuals in 65 countries. The target population in the GWP is the entire civilian, non-institutionalized, population aged 15 and older. All samples were selected using probability sampling techniques and are nationally representative. The GWP surveys average 1,000 individuals per country. Different statistical analyses such as descriptive, crosstabs, binary, and multinomial logistic regressions analyses, were applied in this study. This study assessed the

association between receiving remittances and the food security status, by controlling the role of covariates. Additionally, the predictors of receiving remittances were also measured.

Regardless of GS region, this study found a significant association between receiving remittances and food security (both crosstabs and regression analyses). In the unadjusted logistics regression, regardless of region, while severe food insecurity was significantly related to not-receiving remittances (OR=1.532; P= 0.000), results from socio-demographic factors in the GS indicated that the probability of being severely food insecure increased among individuals who were females (OR=1.061; P=0.000), lived in rural areas (OR=1.645; P=0.000), in large households (OR=1.750; P=0.000), in ages between 26 and 49 years (OR=1.171; P=0.000), in the poorest 20% of income quintile (OR=2.994; P=0.000), with low education (OR= 6.568; P=0.000), unemployed (OR=1.948; P=0.000), and divorced/separated or widowed (OR=1.370; P=0.000).

Regarding GS regions, in the unadjusted logistics regression, the findings from this study indicate that the likelihood of being severely food insecure was significant for people in sub-Saharan Africa (SSA) (OR=2.080; P=0.000), and Asia (Southeast, South, and East) (OR=1.384; P=0.000) for those who did not receive remittances from migrants. In the adjusted model, socio-demographic factors also remained significantly related to food security. As a result, this study found that receiving remittances seems to indirectly influence the food security status of individuals receiving remittances in the GS through household income, education, employment, and the area of residence.

In terms of the determinants of receiving remittances within regions, the results of the unadjusted logistics regression analyses showed that people living in rural areas of sub-Saharan Africa (SSA) and Latin America and the Caribbean (LAC) were less likely to receive remittances. In contrast, people living in rural areas in the Middle East and North Africa (MENA) and Asia

(Southeast, South, and East), were more likely to receive remittances from outside of the country. However, no significant association was found between the area of residence and receiving remittances for the Commonwealth of Independent States (CIS). Only in SSA and LAC receiving remittances was significantly related to education levels. Notably, respondents with low education were less likely to receive remittances. Concerning employment status, part-time employed respondents from all regions were more likely to receive remittances. Within all the regions in this study, the poorest 20% income quintile households were less likely to receive remittances.

Apart from global as well as regional levels, both unadjusted and adjusted regression analyses were carried out for ten countries in the GS. The results for the single countries within GS regions indicated that in Liberia, Yemen, Haiti, and Nepal not receiving remittances was significantly related to moderate and severe food insecurity. In these four countries and South Africa, not receiving remittances was negatively associated with being food secure.

Although receiving remittances seems to positively impact the food security status of individuals in the GS, regardless of region, the association might not apply to all countries in the analyzed sample. More detailed analysis for individual countries and with larger samples of households or individuals are required to better understand such relationship. Still, institutions and agencies involved in food security policy, programing and interventions should consider the role of remittances in the GS and how to incorporate this element into their work.

Résumé

Depuis l'an 2000, le nombre de migrants internationaux a augmenté de façon constante pour atteindre 258 millions en 2017. Plus d'un tiers des migrations internationales vont du sud vers le nord, essentiellement des pays en développement vers les pays développés. À l'instar des migrations internationales, mais dans le sens opposé, les flux d'envois de fonds largement vers les pays en développement ont également augmenté depuis 2000. Les transferts de ces fonds vers les pays émergents attirent une attention croissante en raison de leur augmentation en volume et de leur impact sur les pays bénéficiaires. La réception des fonds de sources extérieures au pays est devenue une stratégie d'adaptation des ménages susceptible de réduire la pauvreté, d'atténuer la faim, de promouvoir de meilleurs régimes alimentaires, et d'accroître les investissements productifs.

Tout d'abord comme ce sujet est mal connu, cette étude a été conçue pour analyser le lien entre l'envoi de fonds et le statut de sécurité alimentaire dans les régions du sud du monde « Global South (GS) ». Quoique certaines études explorent l'association entre la réception des envois de fonds et la qualité / quantité de la consommation alimentaire, ou des dépenses de consommation alimentaire dans les ménages de certains pays, cette étude est à ce jour la seule à utiliser le « Food Insecurity Experience Scale (FIES) » pour examiner l'association entre la sécurité alimentaire et la réception des envois de fonds pour les gens dans le sud du monde « Global South (GS) ».

Les données ont été obtenues à partir du sondage mondial « Gallup World Poll (GWP) » 2017, qui a mené des entretiens en face à face avec 68 463 personnes dans 65 pays. La population cible du GWP est l'ensemble de la population civile non institutionnalisée, âgée de 15 ans et plus. Tous

les échantillons ont été sélectionnés à l'aide de techniques d'échantillonnage probabiliste et sont représentatifs à l'échelle nationale. Les enquêtes du GWP couvrent en moyenne 1000 personnes par pays. Différentes analyses statistiques, telles que des analyses de régression logistique descriptives, croisées, binaires et multinomiales, ont été appliquées dans cette étude pour évaluer l'association entre les envois de fonds et le statut de sécurité alimentaire, en contrôlant le rôle des co-variables. De plus, les prédicteurs de réception des envois de fonds ont également été mesurés.

Indépendamment de la région GS, cette étude a trouvé une association significative entre les envois de fonds et la sécurité alimentaire (à la fois les analyses croisées et les analyses de régression). Quelle que soit la région, alors que l'insécurité alimentaire sévère était significativement liée à l'absence de transferts de fonds (OR = 1.532; P = 0.000) dans la régression logistique non ajustée, les facteurs sociodémographiques du GS ont montré que la probabilité d'insécurité alimentaire grave augmentait parmi les personnes de sexe féminin (OR = 1.061; P = 0.000), vivant dans des zones rurales (OR = 1.645; P = 0.000), vivant dans de grands ménages (OR = 1.750; P = 0.000), âgées entre 26 ans et 49 ans (OR = 1.171; P = 0.000), étant dans le quintile de revenu le plus pauvre (OR = 2.994; P = 0.000), avec un faible niveau d'instruction (OR = 6.568; P = 0.000), sans emploi (OR = 1.948; P = 0.000) et divorcée / séparée ou veuve (OR = 1.370; P = 0.000).

Dans la régression logistique non ajustée des régions du GS, les résultats de cette étude indiquent que la probabilité d'une insécurité alimentaire grave était significative en Afrique subsaharienne (ASS = 2.080; P = 0.000) et en Asie (sud-est, sud, et est) (OR = 1.384; P = 0.000) pour ceux qui n'avaient pas reçu de fonds des migrants. En ce qui concerne le modèle ajusté, les facteurs sociodémographiques sont également restés liés de façon considérable à la sécurité alimentaire. En conséquence, cette étude a révélé que les envois de fonds ont tendance à influencer

indirectement le statut de sécurité alimentaire des individus du GS qui reçoivent les envois de fonds en fonction du revenu du ménage, du niveau d'instruction, de l'emploi et de la zone de résidence.

Pour ce qui est des déterminants des transferts de fonds dans les régions, les résultats des analyses de régression logistique ajustées ont démontré que les personnes vivant dans les zones rurales d'Afrique subsaharienne (SSA) et d'Amérique latine et des Caraïbes (LAC) étaient moins susceptibles de recevoir des fonds. Par contre, les personnes vivant dans les zones rurales au Moyen-Orient et en Afrique du Nord (MENA) et en Asie (sud-est, sud et est) étaient plus susceptibles de recevoir des envois de fonds de l'extérieur du pays. Toutefois, aucune association significative n'a été trouvée entre la zone de résidence et l'envoi de fonds pour la Communauté d'États indépendants (CIS). Ce n'est que dans les pays d'Afrique subsaharienne (SSA) et d'Amérique latine et des Caraïbes (LAC) que les transferts de fonds étaient liés de manière considérable au niveau d'éducation. À noter, les personnes interrogées ayant un niveau d'éducation inférieur étaient moins susceptibles de recevoir des fonds. En ce qui concerne la situation de l'emploi, les répondants de toutes les régions qui travaillaient à temps partiel étaient plus susceptibles de recevoir des fonds. Dans toutes les régions de cette étude, les ménages figurant aux quintiles de revenu les plus pauvres (20%) étaient moins susceptibles de recevoir des fonds.

À l'exception des niveaux mondiaux et régionaux, des analyses de régression non ajustées et ajustées ont été effectuées pour dix pays du GS. Les résultats pour les pays individuels dans les régions du GS ont indiqué qu'au Libéria, au Yémen, en Haïti et au Népal, le fait de ne pas recevoir d'envois de fonds était lié de façon importante à une insécurité alimentaire modérée et grave. Dans ces quatre pays et en Afrique du Sud, le fait de ne pas recevoir de fonds était associé de manière négative à la sécurité alimentaire.

Bien que la réception d'envois de fonds semble avoir un impact positif sur la sécurité alimentaire des individus du GS, quelle que soit la région, l'association pourrait ne pas s'appliquer à tous les pays de l'échantillon analysé. Une analyse plus détaillée pour chaque pays et avec des échantillons plus importants de ménages ou d'individus est nécessaire pour mieux comprendre cette relation. Cependant, les institutions et les agences impliquées dans la politique, la programmation, et les interventions en matière de sécurité alimentaire devraient examiner le rôle des envois de fonds dans la région du GS et comment intégrer cet élément dans leur travail.

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Contribution of Authors

The authors listed in this thesis contributed to various stages of the research project. As the first author, Narges Ebadi created the research question, reviewed the literature, analyzed the data, interpreted the findings and results, and wrote all the sections of this thesis. Dr. Hugo Melgar-Quiñonez, from School of Human Nutrition and Director of the Gilliam Institute for Global Food Security, supervised this research project with his knowledge and experience as well as contributed to conceptualizing the entire thesis. Dr. Thomas Soehl, from the Department of Sociology at McGill University, provided assistance with the theoretical framework and the conceptualization of this research project. Davod Ahmadi, the data analyst in the Gilliam Institute for Global Food Security, also provided assistance during all stages of this study. He confirmed all statistical analyses and helped me with the interpretation and the presentation of statistical findings. He provided assistance with the theoretical framework and conceptualization of this research. He also contributed to accomplishing this research project and the papers of this study. Professor Ibrahim Sirkeci from Regent's University London provided beneficial guidance and feedback to revise this thesis and the papers of this research.

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Abbreviations

CIS	-	Commonwealth of Independent State
FAO	-	Food and Agriculture Organization of the United Nations
FIES	-	Food Insecurity Experience Scale
GS	-	Global South
GDP	-	Gross Domestic Product
GWP	-	Gallup World Poll
IOM	-	International Organization for Migration
ILO	-	International Labour Organization
IRT	-	Item Response Theory
LAC	-	Latin America and the Caribbean
MENA	-	Middle East and North Africa
NPC	-	National Planning Commission
SSA	-	Sub-Saharan Africa
VOH	-	Voices of the Hungry
WFP	-	World Food Program

Chapter 1: Introduction

1.1 Background

The number of international migrants has continued to grow over recent decades, reaching 258 million in 2017, up from 173 million in 2000, worldwide (United Nations, 2017). Due to the complexity of migration, there is no single comprehensive theory to articulate how it functions. However, there are factors such as poverty, lack of employment opportunities, limited access to social protection, lack of access to natural resources, and food insecurity that are the main factors which compel people to leave their homes (Food and Agriculture Organization of the United Nations (FAO), 2017a). These are labeled "human insecurity", reflecting various conflicts, conflicts of interest, tensions causing discomfort, and potentially leading to out-migration (Sirkeci, 2009; Sirkeci & Cohen, 2016).

International migration is a response to differences in living standards, wages, and supply and demand conditions in the labor markets of different countries. It can be clearly seen that over the last decades, migration from Latin America and the Caribbean (LAC) has been expanding, and it is closely related to employment, income, and decent work opportunities (International Labour Organization (ILO), 2017). Also, an array of complex and intertwined factors explains the occurrence of migration in sub-Saharan Africa (SSA). For instance, migrants move to improve their human benefits and escape poverty, food insecurity, unemployment, and gender and other forms of inequalities (Mercandalli & Losch, 2017). Asia and the Pacific region have been a major exporter of millions of migrants to other parts of the world because of their demography, income inequality, conflict, and climate change (International Organization for Migration (IOM), 2017b).

The Middle East and North Africa (MENA) present one of the most complex migration areas, as both are labor-sending and receiving regions. As for causes, migration in the Middle Eastern countries has occurred in response to socio-demographic trends, instability, conflict, and climate change (IOM, 2017a).

Similar to migration, the flow of remittances to developing countries has grown steadily and significantly despite some periodical declines in recent decades (World Bank, 2017; World Bank, 2018a). The concept of the Global South refers to low- and middle-income countries in Latin America and the Caribbean (LAC), Middle East and North Africa (MENA), sub-Saharan Africa (SSA), and Asia, which benefit greatly from receiving remittances (World Bank, 2018a; World Bank, 2018b). Because of the increase in volume and impact on recipient countries, international remittances have been gaining more attention (Anyanwu & Erhijakpor, 2010). In 2018, the flows of monetary remittances globally were estimated to be about $689 billion US, of which $528 billion US were estimated to be transferred to developing countries (World Bank, 2018b). Specifically, flows of remittances to SSA increased by 10.3% to reach $41 billion US in 2017, after a slowdown in 2016. In 2018, the growth of remittances to SSA was expected to increase by 9.8% and reach $45 billion US (World Bank, 2018b). It seems that remittances are especially important for LAC. With flows of $79 billion US in 2017, this region is currently one of the top remittance-receiving regions in the world. In 2018, flows of remittances were expected to increase by 9.3%, reaching $87 billion US (World Bank, 2018b). Remittances to MENA grew by 6.0% to reach $54 billion US in 2017, and growth in remittances to the region was expected to increase to 9.1% to reach $59 billion US in 2018 (World Bank, 2018b). The flows of remittances to South Asia accelerated to reach $117 billion US in 2017, and they were expected to rise by 13.5 %, reaching $132 billion US in 2018 (World Bank, 2018b). Remittances to the East Asia and

Pacific region rose 5.1% to reach $133 billion US in 2017. In 2018, flows of remittances to this region were expected to rise by 6.6% to reach $142 billion US (World Bank, 2018b).

Remittances have impacts on macro as well as micro levels. Apart from the macro impacts whereby remittances provide the necessary support for increasing economic growth **(**Meyer & Shera, 2017; Sarkar, Rahman, Islam, Sikdar, & Khan, 2018), receiving remittances is seen at the micro level as one of the coping strategies supporting families, especially in the times of (financial or other) crises (Sirkeci, Cohen, & Rahata, 2012), and contributing to poverty reduction and improving well-being of households (Adams & Cuecuecha, 2013; López-Córdova, 2005; Dhungana & Pandit, 2014; Lokshin, Bontch-Osmolovski, & Glinskaya, 2010). Notably, remittances seem to function effectively on food security in developing countries (Leliveld, 1997; Regmi, Paudel, & Williams, 2014; Regmi & Paudel, 2016; Szabo, Adger, & Matthews, 2018). Consistent with this point, remittances may lead to increase in household food calorie consumption (Nguyen & Winters, 2011; Babatunde, 2018) or food consumption expenditure (Adams & Cuecuecha, 2010a; Tolstokorova, 2012; Zezza, Carletto, Davis, & Winters, 2011).

1.2 Study Rationale

The definition of food insecurity refers to a situation that "exists when people do not have adequate access to sufficient amounts of safe and nutritious food for an active and healthy life" (FAO, 2003). According to the recent report "The State of Food Security and Nutrition in the World" (2018), approximately 821 million, or one in every nine people in the world, were undernourished in 2017, reflecting that food insecurity appears to exist in almost all sub-regions of Africa, Latin America and the Caribbean, and Asia (FAO et al., 2018). Insecurity in general and food insecurity in particular have been noted to be major causes of migration (FAO, 2017a; Cohen

& Sirkeci, 2016). Conversely, when family members migrate, they tend to send remittances back to family members left in their country of origin, helping to improve the financial situation of those at home (Sirkeci, Cohen, & Rahata, 2012). Specifically, receiving remittances helps to improve access of people to food requirements and increases the food security situation of households. People who receive remittances are more food secure and are able to access food in comparison to those who do not receive remittances (Regmi & Paudel, 2016; Abadi, Techane, Tesfay, Maxwell, &Vaitla, 2013; Zhou et al., 2017).

Although there are some studies that explore the association between receiving remittances and household food quality and quantity consumption or food expenditures, this is the first study that examines the association between receiving remittances and food security by using the Food Insecurity Experience Scale (FIES) for individuals in the Global South (GS). Until now, very little attention has been given to the association between receiving remittances and individuals' food and nutrition security status at the global level.

1.3 Study Objective and Contributions

This thesis seeks to answer the question: What is the association between receiving remittances and food security in the Global South? It has one objective and makes two contributions: The objective is to fill a gap in the literature by investigating the association between receiving remittances and food security status. As for contributions, this study first focuses on the Global South because these countries receive the most remittances from outside and provide an appropriate context for the study. Secondly, this study examines the association between covariates and food security, as measured by the Food Insecurity Experience Scale (FIES). Covariates are socio-demographic factors such as the area of residence (rural vs urban), age, gender, marital

status, household size, education, employment status, income quintile, confidence in national government, and corruption index.

Chapter 2: Literature Review

This chapter focuses on the conceptualization and definition of remittances; the relationship between remittances and food security; remittances and employment, agriculture, education, and health.

2.1 Conceptualizing Remittances

The definition of remittances has been broadened in the last decade or so to reach beyond the flows of monetary and non-monetary goods, formal or informal transactions to transfer of ideas, attitudes and cultures (Sirkeci et al., 2012; Zohry, 2017; Levitt & Lamba-Nieves, 2013; Cohen & Sirkeci, 2016; Zotova & Cohen, 2016). The impact of directing international remittances into developing countries is taken for granted; and, now, they are ranked as the second highest external financial resources after foreign direct investment. Remittances, for instance, are three times higher than official development aid in some developing countries (World Bank, 2018b).

According to the New Economics of Migration Theory, sending and receiving remittances are the key goals for migrants and households (Kubursi, 2006). For instance, the family "can rely on migrant remittances for support" when their productive activities fail to bring enough income to the household (Massey et al., 1993, p. 436). The decision to migrate is a collective decision made by the extended family or, even more broadly, by the village with a strategic view (Azam & Gubert, 2006).

However, all migrants are not successful in sending remittances to their home countries. Successful migrants, through sending money to their home countries, often contribute to the economic hardships of their relatives. Unsuccessful migration happens when households in the

home countries face financial issues due to the huge loans, they take out to send migrants abroad (World Food Program (WFP), 2017).

2.2 Remittances and Food Security

In recent decades, remittances have emerged as an important source of external financial resources in developing countries (World Bank, 2018b). Receiving remittances can change the structure of consumption, including investment in human capital, physical capital, and consumption of goods as well as food in some cases (Adams & Cuecuecha, 2010a; Adams & Cuecuecha, 2010b; Acharya & León-González, 2018; Medina & Cardona, 2010). It seems that the style of spending remittances seems to depend on households' economic status and the amount of remittances received by them in these countries. For instance, Adams and Cuecuecha (2010b) found that by receiving remittances Guatemalan households were able to spend more of their remittances on investment in human (education and health) and physical (housing) capital. By contrast, another study indicated that recipient households in Indonesia spent most of their income remittances on consumption of goods and food (Adams & Cuecuecha, 2010a). What is important to note is the amount of remittances received by households in different countries. According to two above studies, Guatemalan households received more remittances, while families in Indonesia were much poorer and received fewer remittances**.** On the other hand, remittances as the main source of income for poor families help these households spent the received resources to purchase food, which might play an essential role in improving the food security status of the poorest (National Planning Commission (NPC), 2013).

Food security is defined as the state "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for

an active and healthy life" (FAO, 1996). Studies on remittances and food security fall into two main groups. First of all, some studies focus on household food consumption. In these studies, remittances increase food calorie consumption, but they do not affect diet diversity and food quality. A study by Nguyen and Winters (2011) shows the impact of remittance income on food security in Vietnam. They measured the food security of households by analyzing food calorie consumption in food groups such as fruit, vegetables, meat, etc. They suggested that remittances have a positive impact on food calorie consumption, but they are not associated with improvement in diet diversity. A study of rural households in Nigeria by Babatunde (2018) indicated that remittance-receiving households consume more calories than non-remittance-receiving households. Households do not spend remittances on quality foods and micronutrients, but remittances are used to buy starchy staple foods. Thus, remittances might affect family members' underweight status. However, according to Durand, Parrado, and Massey (1996), receiving remittances promotes the quantity and quality of foods and encourages people to consume more food and macronutrients (e.g., staple crops, meat, milk, processed foods, etc.).

Secondly, some studies investigate the link between remittances and household food consumption expenditure. For example, Adams and Cuecuecha (2010a) studied the economic impact of international remittances on remittance-receiving and non-receiving households in Indonesia. They found that remittances caused an 8.5% increase in the average budget share in consumption expenditure on food (purchased or homemade food). According to Thow, Fanzo, and Negin's (2016, p. 42) systematic review, remittances increase the ability to purchase food and could produce a "consumption smoothing effect", improving food security and reducing underweight. The reviewed studies suggest, however, that extra remittance income can increase purchasing of less healthy (nontraditional) foods associated with the "nutrition transition".

Consistent with these studies, a study by Tolstokorova (2012) in Ukraine showed that receiving remittances has a positive effect on reducing poverty and increasing financial stability through a smoothing effect on consumption among families. Further, according to Zezza et al. (2011), remittances resulting from migration are both domestic and international trends that impact income directly and positively because of food and nutrient consumption and indirectly affect income by minimizing economic burdens and constraints.

Apart from the positive effect of remittances on food consumption and expenditures, a study by Medina and Cardona (2010) shows the impact of remittances on household consumption and expenditures in Colombia. They did not find any significant effect of remittances on consumption, including goods and food. In contrast, they found that remittances have a positive impact on the standard of living of households. A study by Bui, Le, and Daly (2015) reached approximately the same conclusion as the previous study. They compared the influence of remittances on household consumption behavior and correlated their results with those who did not receive remittances in Vietnam. They examined household expenditure on food and non-food products as regards receiving remittances as cash or goods. They concluded that Vietnamese households that receive foreign and domestic remittances engage in less food consumption in comparison to households that do not receive remittances. Also, Kaiser and Dewey (1991) conducted a study in three areas of rural Mexico by using the subsistence score during winter (post-harvest) and summer (pre-harvest). They analyzed data related to household income sources, including remittances, to measure food expenditure and food consumption. They found that households that are strongly dependent on remittance income spend less of their budget on meat, milk, fruit, and nutritious foods during winter. In contrast, they found that during winter, migrants' household expenditures increased by the purchase of 'luxury' goods and food and less traditional foods.

However, apart from the impact of remittances on households' food security, receiving remittances can increase households' financial investment through agriculture, business activities, and purchasing of goods, including health and education. By considering the important role of remittances in various receiving countries in the following sections of this chapter, different features of remittances in relation to employment, agriculture, education, and health will be discussed.

2.3 Remittances and Employment

Remittances may contribute to reducing employment of migrants' relatives and their participation in the local market in the region receiving remittances (Rodriguez &Tiongson, 2001; Funkhouser, 1992). A study by Kim (2007) in Jamaica found that remittances increase the real wage for migrants' families, which leads to a decrease in labor supply by taking people out of the labor force. Although Funkhouser (1992) concludes that remittances decrease labor force participation of remittance-recipient households, they have a positive effect on self-employment. Also, Ivlevs (2016) concludes that remittances can provide capital for starting a small business or self-employment, both of which may occur within the household or on the community level. Bui et al. (2015) in a study on Vietnam argue that remittance-recipient households living in urban areas tend to invest in business activities because of ease of access to the credit market and the improved structural conditions in urban areas. However, households in rural areas tend to invest in necessary equipment that could lead to further productive investment (Zarate-Hoyos, 2004). In addition to adults, youth may receive remittances; and if put to good use, remittances may generate jobs for youth or enable them to start their businesses (Petreski, Mojsoska-Blazevski, Ristovskam, & Smokvarski, 2014).

While receiving remittances seems to respect the labor activity of individuals, it also may reduce hours worked to provide more leisure time (Acosta, Calderon, Fajnzylber, & Lopez, 2008; Görlich, Omar Mahmoud, & Trebesch, 2007). Contrary to these studies Urama, Nwosu, Yuni, and Aguegboh (2017) conclude that remittances have no effect on the average labor supply of migrants' relatives in Nigeria.

2.4 Remittances and Agriculture

In many developing countries, the survival of people is strongly dependent on agriculture. International remittances are seen as a source of income and play a leading role in increasing investment in agriculture and promoting productivity. The flows of remittances into rural areas strongly affect agricultural development, economic progress, and food security (FAO, 2017a). The effect of remittances on agriculture and rural employment is highly dependent on the local context and consumption pattern. In some cases, migrants' relatives prefer to invest their received resources in non-farm activities such as housing, education, and health rather than agricultural production, while evidence worldwide shows the beneficial impact of remittances on rural agricultural production (Vargas-Lundius, Lanly, Villarreal, & Osorio, 2008). For instance, a study by Zahonogo (2011) in Burkina Faso pointed out that receiving remittances through relaxing credit constraints can improve the access of households to improved agricultural technologies and promote farming production among migrants' families. A study by Regmi, Paudel, and Williams (2014) in Nepal showed that remittances in the long term provide additional income for migrant families to invest in agricultural technology, which leads to decreasing food shortages and food insecurity. Another study by Kaninda-Tshikala and Fonsah (2014) in Senegal concludes that remittances from migration although reducing the economic burden, help households to improve

agricultural investment through new technologies. A study by Durand et al. (1996) argues that international remittances from the United States to Mexico contribute to economic development on the regional and national levels, resulting in increased investment, specifically on agricultural production.

However, migration also has a negative impact on the labor force, which contributes to reducing farm production and food insecurity. Therefore, policy makers and agencies should support households with strategies, necessary equipment, and financial resources to promote farming productivity (Kaninda-Tshikala & Fonsah, 2014). Managing remittances by effective policies and promoting investment on farms between households appear to improve agricultural production and food security (FAO et al., 2015).

2.5 Remittances and Education

It has been stated that receiving remittances can have a positive effect on the educational outcomes in developing countries. A study by Azizi (2018) indicates that receiving remittances through lessening investment constraints encourages households to invest more in their children's school enrollment. According to this study, on average an increase of 10% in per capita remittances contributes to increasing in pre-primary and secondary enrollment by 3.5% and 0.6%, respectively. Also, a study by Ambler, Aycinena, and Yang (2015) concludes that remittance-recipient families can invest in their dependents' education, which leads to increased educational expenditures and higher private school attendance. Another study by Gyimah-Brempong and Asiedu (2015) in Ghana demonstrates that remittances can produce great economic growth outcomes because households will be more likely to enroll their children in primary and secondary school. Notably, a study by Hanson and Woodruff (2003) in Mexico showed that remittances can increase

household income, and that children of migrants' households are more likely to complete their further education.

Besides the impact of remittances on children's schooling, getting a higher education is positively associated with income in both host country and country of origin (Chaaban & Mansour, 2012). The reason for this is that people who have completed higher education may have more income-generating possibilities and become less dependent on future remittances (Görlich et al., 2007).

2.6 Remittances and Health

Remittances contribute to health promotion in two ways: first, they can improve the nutritional status of people, particularly children, by providing good quality food; and secondly, flows of income can be used for acquiring better health services (Dhungana & Pandit, 2014). The findings from one study in Nigeria indicated that remittances are not spent on micronutrient-rich foods, but they are used to buy starchy staple foods. As a result, remittances can improve calorie consumption of households (Babatunde, 2018). Therefore, the risk for adults in remittance-receiving households to face being underweight compared to non-remittance receivers seems to be lower, but they did not run the risk of being overweight (Lu, 2013). Another study by Leroy, Gadsden, González de Cossío, and Gertler (2013) among rural women in Mexico indicated that receiving food remittances seems to increase weight gain among those who are already overweight and obese. However, there are only a few studies that focus on the risk of being overweight and receiving remittances among remittance-recipient households. Future research is required to investigate the hidden facets of the impact of remittances on being overweight and obesity.

Another point of view relevant to the current discussion, importantly, is the positive impact of inflows of remittances on children's nutritional status. According to Antón (2010), being underweight/WHZ (weight-for-height) as well as wasting/WAZ (weight-for-age) are reduced by receiving remittances. However, remittances appear to have little effect on stunting/HAZ (height-for-age) as a marker of chronic undernourishment. Another study, by Davis and Brazil (2016) focuses on the importance of children fathers' availability at home to provide child care. The authors indicate that the absence and international migration of fathers in the first three years of a child's life increased the risk of stunting the child's growth. However, a study by Azizi (2018) indicated that a 10% increase in per capita remittances contributes to a decrease of 1.5% and 1% in the prevalence of undernourishment and stunting, respectively.

By considering the type of family, there is a significant difference between male- and female-headed families and their children's food security and nutritional status. Female-headed families that do not receive remittances are less likely to have food secure children with better nutritional indicators (NPC, 2013).

Secondly, receiving remittances appears to influence income spent on health care by migrant households. For instance, Amakom and Iheoma (2014) in a study in sub-Saharan Africa found that by increasing the flow of remittances (e.g., 10%) health outcomes improved. Similarly, in another study by Amuedo-Dorantes and Pozo (2011) in Mexico, inflows of remittances increased households' expenditures on health care. In that regard, remittances seem to increase the purchasing power of recipient households in home countries on health expenditures.

To sum up, access to resources, such as agricultural technologies for increasing farm production and improving conditions for business activities, education, and health will encourage households to spend their remittances in more productive ways, especially those related to food

security in both urban and rural areas. Differing patterns of spending remittances among households and regions can be explained by how individuals and governments manage investment and expenditure priorities in relation to the remittance resources.

Chapter 3: General Methodology

3.1 Research Design

This study uses a quantitative research methodology, employing a cross-sectional survey design. The association between food security and receiving remittances in different regions in the Global South (GS) is assessed.

3.2 Research Context

This research is conducted in a collaboration between the McGill University Gilliam Institute for Global Food Security and the Voices of the Hungry (VoH) project. As a project in the FAO, VoH measures the Food Insecurity Experience Scale (FIES) through the Gallup World Poll (GWP) of 2017.

3.3 FAO's Voices of the Hungry Project

The FAO established the VoH in 2013. It relies on the GWP, a branch of Gallup, Inc., which has released nationally representative data on more than 140 countries annually since 2005. Since 2014, the FAO has included the FIES questions in the World Poll questionnaire (FAO, 2018a).

The FAO, with the VoH project, set a baseline to monitor progress in reducing the rate of global food insecurity in all countries by 2015. Therefore, the FIES is a standard and global tool to compare food insecurity in all countries (FAO et al., 2013). Because the FIES estimates individual food insecurity by population level, the GWP sample can provide regional, national,

and international contexts (Ballard, Kepple, & Cafiero, 2013). Another strength of the data is that because it measures individuals, it can be disaggregated by age and sex (Brunelli & Viviani 2014).

3.4 Measurement Using FIES

According to Meade and Thome (2017), "eliminating food insecurity is a goal shared around the globe and it requires ongoing assessments to inform decisionmakers and stakeholders about the direction and speed of progress made. Employing a uniform assessment approach to a large number of countries around the world allows for regional and country-by-country comparisons" (p. iv).

The FIES is an experience-based tool that includes all the dimensions of food insecurity and produces information about the food insecurity condition of individuals or households. It monitors their progressive access to adequate food at the regional, national, and international levels in developed and developing countries (FAO, 2016). The FIES is a timely, valid, cost-effective tool to measure the food "access" of populations. The FIES is not designed to measure the quality and quantity of food consumption, food expenditure, or nutritional adequacy of the diet (FAO, 2018a), "but rather focus[es] more broadly on reported food-related behaviors associated with the experience of food" (Ballard et al., 2013, p. 5). Therefore, the FIES survey defines the level of severity of food insecurity conditions for individuals or households (Nord, Cafiero, & Viviani, 2016) in a way that allows "disaggregation at sub-national levels and across different population groups, making it possible to identify more specifically who the food insecure are and their geographic distribution" (Ballard et al., 2013, p. 5). The VoH applied the cultural and linguistic adaptation of the FIES in four pilot studies in sub-Saharan Africa, Angola, Ethiopia, Malawi, and Niger, in 2013. The goal of the pilot studies was to make sure that the translation of the FIES was

made correctly. Despite the successful adaptation culturally and linguistically, the severity level of food insecurity can differ across countries (Ballard et al., 2013; Brunelli & Viviani, 2014).

According to the FAO (2018a), "the full potential of the FIES to generate statistics that can inform policy is realized when the tool is applied in larger national population surveys that enable more detailed analyses of the food insecurity situation according to income, gender, age, race, ethnicity, migratory status, disability, geographic location, or other policy-relevant characteristics, as is already the case for a number of countries" (p. 3).

The FIES consists of people's response to eight "yes" or "no" questions about their restrictions when it comes to accessing adequate food. Self-reported questions were asked directly to individuals rather than households through face-to-face interviews or by telephone (FAO, 2016).

Figure 1. English version of the Food Insecurity Experience Scale Survey Module

	Standard label	Question wording
1	WORRIED	During the last 12 MONTHS, was there a time when You were worried you would not have enough food to eat because of a lack of money or other resources?
2	HEALTHY	Still thinking about the last 12 MONTHS, was there a time when you were unable to eat healthy and nutritious food because of a lack of money or other resources?
3	FEWFOODS	Was there a time when you ate only a few kinds of foods because of a lack of money or other resources?
4	SKIPPED	Was there a time when you had to skip a meal because there was not enough money or other resources to get food?
5	ATELESS	Still thinking about the last 12 MONTHS, was there a time when you ate less than you thought you should because of a lack of money or other resources?
6	RANOUT	Was there a time when your household ran out of food because of a lack of money or other resources?
7	HUNGRY	Was there a time when you were hungry but did not eat because there was not enough money or other resources for food?
8	WHOLEDAY	During the last 12 MONTHS, was there a time when you went without eating for a whole day because of a lack of money or other resources?

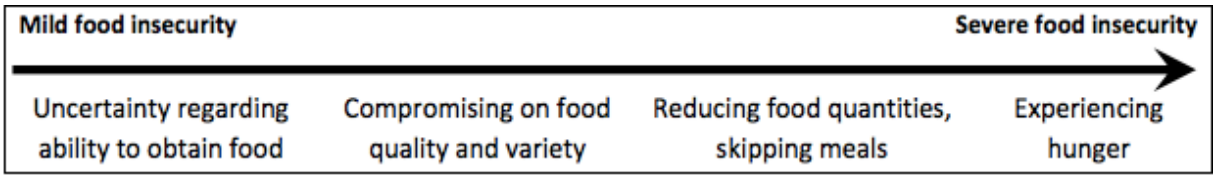
Reference: FAO's Voices of the Hungry project (FAO, 2018b, p. 3).

The FIES focuses on the different experiences associated with varying levels of severity of food insecurity. It includes consideration of compromised diet quality as well as reduced food

quantity. It also refers to psychosocial elements associated with anxiety or uncertainty regarding the ability to procure enough food (FAO, 2018b).

The process of scoring responses is based on the Item Response Theory (IRT) models. The raw score is already measured as an ordinal of severity; lower raw scores are associated with less severe food insecurity. In other words, for each application, a raw score is applied to provide an interval measure of the severity of food insecurity that is comparable across countries. Therefore, a raw score measures the number of affirmative responses ranging from zero to eight on the severity scale (FAO, 2018b). According to the FAO's Voices of the Hungry, a score of zero, in which respondents answer all eight questions negatively, indicates food security. Conversely, scores from one to eight indicate increasingly severe food insecurity (FAO, 2016). There are three levels of the FIES: one to three as mild, four to six as moderate, and seven and eight as severe food insecurity (Ballard et al., 2013; FAO, 2016).

Figure 2. Food insecurity severity along a continuous scale



Reference: FAO's Voices of the Hungry project (FAO, 2018a, p. 4)

In conclusion, according to Ballard et al. (2013), "the collective evidence from existing validation work is sufficient to suggest that the FIES is indeed founded on a valid concept of food insecurity. It covers domains that are common across cultures and socio-economic conditions and thus has *the potential* to form the basis for a valid measure worldwide" (p. 22, emphasis in the original).

3.5 Item Response Theory and Rasch Model

The approach is applied to validate the FIES data based on the IRT, which is based on logistic function and statistical tools to calculate the level of severity of food insecurity status. The IRT models of assumptions can measure an unobservable quantitative construct by a series of dichotomous questions (Ballard et al., 2013). The specific IRT model applied to the FIES data is the Rasch model, widely used in health, education, and psychology. The Rasch model provides a theoretical base and a set of statistical tools to 1) assess the suitability of survey questions ("items") to construct a measurement scale and to 2) compare a scale's performance across different populations and survey contexts. The analysis of the FIES data involves parameter estimation and calculation of the severity of food insecurity associated with each survey item and each respondent. Also, the analysis involved statistical validation; depending on the quality of the data collected, the measure is valid. Further, the calculation of measures of food insecurity includes individual probabilities. For each sampled individual, the likelihood of the individual experiencing food insecurity above a given level of severity is calculated by his/her responses to the FIES questions (FAO, 2018b).

3.6 Sampling and Recruitment

In the GWP normally, all surveys are probability based and nationally representative of the resident population aged 15 and older. The coverage area is the entire country, including rural areas, and the sampling frame represents the entire civilian, non-institutionalized population aged 15 or older of the whole country. Exceptions include areas where the safety of interviewing staff is threatened, scarcely populated islands in some countries, and areas that interviewers could reach only by foot, animal, or small boat. Random Digit Dial telephone surveys are used in countries

where telephone coverage represents at least 80% of the population or is the customary survey methodology. In Central and Eastern Europe and the developing world, including much of Latin America, the former Soviet republics, nearly all of Asia, the Middle East and Africa, an area frame design is used for face-to-face interviewing. A stratified multi-stage cluster design is used for face-to-face surveys. Either population-based or regional stratification data is used (Gallup, Inc., 2017).

For face-to-face interview countries, the first stage of sampling involves the identification of 100-135 sampling units (clusters of households). Population size or geographic units stratify these clusters. The second stage of sampling consists of the selection of households through a random procedure. Samples for telephone survey countries are selected using random digit dialing or a nationally representative list of phone numbers. A dual sampling frame is used where cell phone use is high. The final stage of sampling for both types of surveys is the selection of an individual member of a household to interview (FAO, 2016).

3.7 Sample Selection

In this study, data was collected from the 2017 GWP, which interviewed face-to-face 68,463 individuals in the Global South (GS). The samples are based on random and probability sampling and are nationally representative. Per country, an average of 1,000 individuals was surveyed by GWP. However, in a few countries, larger samples were collected in major cities or areas of particular interest. In some large countries, such as India, China, and Russia, sample sizes exceeding 2,000 were obtained to ensure adequate representation. The samples are nationally representative that have characteristics closely matching the nations under study. Further, the samples are probability based, and coverage includes both male/female and rural/urban areas. The sample used for this project includes data from all Global South countries.

To create the data for these countries, only countries where the GWP conducted face-to-face interviews are included in this project (65 countries). Different regions in the GS, such as the Commonwealth of Independent States (CIS) (n=4000), Asia (Southeast, South, and East) (n=14,906), Latin America and the Caribbean (LAC) (n=16,544), the Middle East and North Africa (MENA) (n=6,013), and sub-Saharan Africa (SSA) (n=27000), were included in the analyses. The FAO validated the FIES data in 2014. However, three countries, China, Bhutan, and Azerbaijan were not validated and are excluded from this study.

Table 1. Sample of the Global South (n=68,463)

Regions	**Countries**	**Sample**	**Regions**	**Countries**	**Sample**
Commonwealth of Independent States	Kazakhstan	1000	Middle East and North Africa	Egypt	1000
	Kyrgyzstan	1000		Jordan	1012
	Tajikistan	1000		Lebanon	1000
	Uzbekistan	1000		Palestinians Territories	1000
				Tunisia	1001
Asia (Southeast, South, and East)	Afghanistan	1000		Yemen	1000
	Bangladesh	1000			
	Cambodia	1600	Sub-Saharan Africa	Benin	1000
	India	3000		Botswana	1000
	Mongolia	1000		Burkina Faso	1000
	Myanmar	1600		Cameroon	1000
	Nepal	1000		Chad	1000
	Pakistan	1600		Congo Kinshasa	1000
	Philippines	1000		Congo Brazzaville	1000
	Sri Lanka	1104		Ethiopia	1000
	Vietnam	1002		Gabon	1000
				Ghana	1000
Latin America and the Caribbean	Argentina	1000		Guinea	1000
	Bolivia	1000		Ivory coast	1000
	Brazil	1000		Kenya	1000
	Chile	1040		Liberia	1000
	Colombia	1000		Madagascar	1000
	Costa Rica	1000		Malawi	1000
	Dominican Republic	1000		Mali	1000
	Ecuador	1000		Mauritania	1000
	El Salvador	1000		Nigeria	1000
	Guatemala	1000		Senegal	1000
	Haiti	504		Sierra Leon	1000
	Honduras	1000		South Africa	1000
	Mexico	1000		South Sudan	1000
	Nicaragua	1000		Tanzania	1000
	Panama	1000		Togo	1000
	Peru	1000		Zambia	1000
	Uruguay	1000		Zimbabwe	1000

Reference: Micro data analysis of GWP, 2017

3.8 Variables

3.8.1 Outcome Variable

The outcome variable is the Food Insecurity Experience Scale (FIES), which is used to measure individuals' food security status. As an individual-based index, this tool contains eight items with "yes" or "no" answers, focusing on the access dimension of food security. Responses to the eight questions are combined, and each individual is assigned a food security score from zero to eight. The FIES was recoded as 0 for "food secure" (FS), 1-3 for "mildly food insecure" 4-6 for "moderately food insecure", and 7-8 for "severely food insecure". To run the logistic regression, every single value of the FIES (FS, Mild, Moderate, and Severe FIS) was recoded as a dummy variable.

3.8.2 Exposure Variable

Receiving remittances is the principal independent variable in this study. The following question is used to measure remittances: "In the past 12 months, did this household receive help in the form of money or goods from another individual living inside this country, living in another country, both, or neither?" The answers to the original question were recoded as either "receiving remittances from outside" or "no remittances."

3.8.3 Controlling Variables

Socio-demographic characteristics were used as covariates in this study. They include sex, age, education, employment status, marital status, income quintile, the area of residence, and household size.

3.8.4 Demographic Variables

The demographic variables used in the analyses are the following:

- Sex was dichotomized into male and female.
- Age as a continuous variable was recoded in four groups (13-25; 26-49; 50-64; 65-99).
- Marital status was categorized according to three levels: 1) single/never married, 2) divorced/separated/widowed, 3) married or living with a partner.
- Area of residence with four value labels (a rural area on a farm; small town or village; large city; a suburb of a large city) were recoded into a dummy variable at two levels (rural and urban).
- Household size was classified at three levels: 1) 1 to 3; 2) 4 to 6; 3) 7 and more.

3.8.5 Socio-economic Variables

Socio-economic variables used in the analyses are the following:

- Education was categorized at three levels: 1) completed elementary education or less (up to 8 years of basic education); 2) secondary: 3-year tertiary secondary education and some education beyond secondary education (9-15 years of education);
  3) completed four years of education beyond high school.
- Employment status: GWP classifies respondents into one of six categories (employed full time by an employer; employed full time by self; employed part time, do not want to work full time; employed part time, want to work full time; unemployed; out of the workforce). But in this study, employment status was recoded for four levels:
  1) unemployed; 2) out of the workforce; 3) employed part time; 4) employed full time.

- Income quintile: To create per capita income quintiles, income data from per capita annual income in international dollars was used to divide respondents into five groups of equal size. This provides a measure of respondent wealth that is relative to other respondents in that country. This variable provides a view of wealth within a given country: 1) Poorest 20%; 2) 21% - 40%; 3) 41% - 60%; 4) 61% - 80%; 5) Richest 20%.

3.8.6 Society-related Variables

Additionally, the following variables which related to country condition were also analyzed in this study:

- The corruption index was used to assess perceptions in a community about the level of corruption in business and government.
- To measure the confidence in the government, the following question was used: "In this country, do you have confidence in national government?"

3.9 Statistical Analysis

Data were analyzed using SPSS (Version 24). Different statistical analyses were carried out in this study. Descriptive statistics (percentages) were used to explore the frequencies of the food security status, receiving remittances, and controlling variables. Crosstabs analyses were also carried out to explore the association between dependent and independent variables. Also, two binary logistic regression analyses were carried out as well. The first one was performed to assess the association between food security status and receiving remittances by controlling each of the covariates. The second was carried out to measure the association between receiving remittances and the covariates.

It should be noted that the FIES (as outcome variable) was separated into four different levels with yes and no answers. The level of significance was reported at the P-value equal to or less than 0.05. In the crosstab analyses, apart from the level of significance, the strength of associations between dependent and independent variables was estimated through Cramer's V and Gamma to show the direction of the association between variables.

Chapter 4

4.1 Results

The characteristics of the sample are presented in Table 2. In the current study, the Global South (GS) (n=68,463) is made up of the five regions, such as sub-Saharan Africa (SSA) (n=27,000); Middle East and North Africa (MENA) (n=6,013); Latin America and the Caribbean (LAC) (n=16,544); Asia (Southeast, South, and East) (n=14,906); and the Commonwealth of Independent States (CIS) (n=4,000). Regardless of region, 32% of individuals were food secure, while about 28% of individuals were severely food insecure, and only 6% of households received remittances from outside the country in the Global South (GS).

In terms of socio-demographic characteristics, females represented just over half of the sample, 44% of the sample were between 26 and 49 years old, and around 54% of individuals were married or living with a partner. Further, many people living in the GS were ranked as low educated (51%), and little more than one-third of the sample were employed full time (36%). Also, 65% of individuals reported living in rural areas and 44% reported living in a household between 4 and 6 people. The results also state that more than 60% of respondents reported living in countries with high corruption rates, and 43% of the respondents had no confidence in national government (Table 2).

The prevalence of four levels of the Food Insecurity Experience Scale (FIES) in the five regions in the GS is reported in Table 3. The results show that about 14% of SSA and 58% of the CIS reported being food secure. However, more than 40% of samples in MENA, LAC, and Asia reported being food secure in 2017.

Table 2. Characteristics of sample (n=68,463)

		N (%)
Regions	Commonwealth of Independent States	4,000 (5.8)
	Asia (Southeast, South, and East)	14,906 (21.8)
	Latin America and the Caribbean	16,544 (24.2)
	Middle East and North Africa	6,013 (8.8)
	Sub-Saharan Africa	27,000 (39.4)
Food security status	Severely food insecure	18,360 (28.3)
	Moderate food insecurity	12,479 (19.2)
	Mild food insecurity	13,065 (20.1)
	Food secure	20,965 (32.3)
Receiving remittances	Yes	3,373 (6.1)
Area of residence	Rural	44,266 (64.7)
	Urban	24,1925 (35.3)
Household size	7 and more	19,488 (28.5)
	4-6	30,230 (44.2)
	1-3	18,745 (27.4)
Sex	Female	35,199 (51.4)
	Male	33,264 (48.6)
Age	13-25	23,052 (33.7)
	26-49	30,472 (44.5)
	50-64	9,794 (14.3)
	65-99	5,145 (7.5)
Marital status	Single/never married	24,621 (36.1)
	Divorced/separated/widowed	6,437 (9.4)
	Married/living with partner	37,161(54.5)
Education	Completed elementary	34,597 (51.0)
	Secondary-3-year Tertiary	28,963 (42.7)
	Four years of over high school	4,344 (6.4)
Employment	Unemployed	5,372 (7.8)
	Out of workforce	24,955 (36.5)
	Employed part time	13,383 (19.5)
	Employed full time	24,752 (36.2)
Corruption index	0 (Lowell & Findlay)	13,025 (20.5)
	50 (Moderate)	12,255 (19.3)
	100 (High)	38,169 (60.2)
Confidence in national government	Yes	35,465 (57.6)

Reference: Data analysis of the Gallup survey, 2017

Table 3. Prevalence of Food Insecurity Experience Scale in regions of the Global South (n=68,463)

	Sub-Saharan Africa	Middle East and North Africa	Latin America and the Caribbean	Asia (Southeast, South, East)	Commonwealth of Independent States
Severe FIS	47.9	12.4	21.6	12.2	5.7
Moderate FIS	22.6	17.8	16.6	18.4	11.6
Mild FIS	15.7	18.7	20.6	27.2	24.4
Food secure	13.8	51.0	41.1	42.2	58.2

Reference: Data analysis of the Gallup survey, 2017

The results shown in Tables 4 and 5 demonstrate the coefficient estimates on the determinants of the FIES and receiving remittances, respectively.

The association between the FIES and explanatory variables in Table 4 shows that a significant association was observed between receiving remittances and food security status. However, this association was very weak (0.043; P=0.000). According to the findings, all socio-demographic characteristics were found to be significantly related to food security. A significant association

was observed between sex and food security status (0.028; P=0.000). Males were more food secure than females in the GS countries, regardless of region. Education was strongly associated with food security status compared to the other covariables (0.353; P=0.000). And the association between employment and food security was very weak (0.035; P=0.000). Income per capita was also found to be significantly associated with food security (0.243; P=0.000). In terms of family size and household composition, a significant association was observed with food security status (0.168; P=0.000). The results indicated that urban people were more food secure than their rural counterparts (0.141; P=0.000). In terms of society-related factors, a very weak association was observed between food security status and corruption rates (-0.041; P=0.000), but the association between confidence in national government and food security status was not significant.

The association between receiving remittances and explanatory variables in Table 5 shows that all the explanatory variables were significantly associated with receiving remittances.

Table 4. Bivariate analyses between the food security status[1] and independent factors (n=68,463)

			Strength of association	Level of significance
Principal independent variable	Receiving remittances	Cramer's V	0.043	0.000
Socio-demographic variables	Sex	Cramer's V	0.028	0.000
	Area of residence	Cramer's V	0.141	0.000
	Age groups	Gamma	-0.012	0.016
	Marital status	Gamma	-0.041	0.000
	Household size	Gamma	0.168	0.000
	Education	Gamma	0.353	0.000
	Employment	Gamma	0.035	0.000
	Per capita income quintile	Gamma	0.243	0.000
Society-related indices	Corruption index	Gamma	-0.041	0.000
	Confidence in national government	Cramer's V	0.010	0.137

Reference: Data analysis of the Gallup survey, 2017
1. FIES (0= Severely Food Insecure (FIS); 1= Moderately FIS; 2= Mildly FIS; 3=Food secure)

Table 5. Bivariate analyses between receiving remittances and independent factors (n=68,463)

			Strength of association	Level of association
Socio-demographic factors	Area of residence	Cramer's V	0.036	0.000
	Household size	Cramer's V	0.011	0.036
	Education	Cramer's V	0.036	0.000
	Employment	Cramer's V	0.036	0.000
	Per capita income quintile	Cramer's V	0.070	0.000
Society-related indices	Corruption index	Cramer's V	0.013	0.010
	Confidence in national government	Cramer's V	-0.031	0.000

Reference: Data analysis of the Gallup survey, 2017

Findings from the unadjusted binary logistic regression analyses between the four levels of FIES and receiving remittances by controlling covariates are presented in Table 6. The results show that severe food insecurity was significantly associated with receiving remittances. The findings revealed that non-remittance receivers were more likely to be severely food insecure (OR=1.532; P=0.000). In terms of region, sub-Saharan Africa (OR=15.28; P=0.000) was categorized as the region with the most severe food insecurity compared to the other regions. Results from socio-demographic factors of all regions indicated that the probability of being severely food insecure increased among females (OR=1.061; P=0.000), living in rural areas (OR=1.645; P=0.000), in large households (OR=1.750; P=0.000), between 26 and 49 years of age (OR=1.171; P=0.000), in the poorest 20% of income quintile (OR=2.994; P=0.000), with low education (OR= 6.568; P=0.000), being unemployed (OR=1.948; P=0.000), and divorced/separated and widowed (OR=1.370; P=0.000).

Further, the results show that food security was significantly associated with receiving remittances. The findings indicated that non-remittance receivers were less likely to be food secure (OR= 0.898; P=0.000). In terms of region, food security was low in sub-Saharan Africa (OR= 0.115; P=0.000) compared to the other regions. Within all regions, the probability of being food secure decreased among people living in rural areas (OR=0.567; P=0.000), with low education level (OR=0.189; P=0.000), and being out of the workforce (OR=1.138; P=0.000). The findings also showed that people living in large households (7 and more) were less likely to be food secure (OR=0.484; P=0.000). In terms of sex and food security, females were less likely to be food secure compared to their male counterparts (OR= 0.898; P=0.000). In terms of marital status, the results indicated that divorced/separated and widowed people were less likely to be food secure (OR=0.882; P=0.000). A significant positive association was observed between income quintile

and food security status (OR=0.257; P=0.000). In terms of society-related indices, the results showed that food security status increased in countries with low corruption (OR=1.109; P=0.000).

Table 6. Unadjusted binary logistic regression analyses between FIES, and receiving remittances and covariates (n=68,463)

		Severely FIS			Moderately FIS			Mildly FIS			Food Secure		
			95% CI			95% CI			95% CI			95% CI	
		Odds ratio	Low	High	Odds ratio	Low	High	Odds ratio	Low	High	Odds ratio	Low	High
Receiving remittances	No	1.532	1.404	1.672	0.897	0.821	0.980	0.803	0.739	0.874	0.898	0.833	0.967
	Yes (Ref)												
Regions	Sub-Saharan Africa	15.28	13.26	17.60	2.218	1.997	2.463	0.574	0.528	0.623	0.115	0.106	0.123
	Middle East and North Africa	2.352	2.005	2.760	1.643	1.456	1.854	0.712	0.644	0.787	0.748	0.689	0.813
	Latin America and the Caribbean	4.577	3.960	5.291	1.514	1.357	1.689	0.804	0.739	0.875	0.501	0.465	0.539
	Asia (southeast, south, and East)	2.309	1.990	2.678	1.705	1.529	1.902	1.155	1.063	1.256	0.524	0.487	0.564
	Commonwealth Independent States (Ref)												
Area of residence	Rural	1.645	1.584	1.707	1.204	1.155	1.256	1.006	0.967	1.048	0.567	0.549	0.587
	Urban (Ref)												
Household size	7 and more	1.750	1.672	1.832	1.316	1.249	1.386	0.948	0.899	0.998	0.484	0.462	0.506
	4-6	1.059	1.014	1.106	1.086	1.034	1.140	1.069	1.021	1.121	0.864	0.831	0.898
	1-3 (Ref)												
Sex	Female	1.061	1.025	1.098	1.091	1.049	1.134	0.987	0.950	1.026	0.898	0.869	0.928
	Male (Ref)												
Age	13-25	1.006	0.938	1.079	1.035	0.955	1.122	1.066	0.985	1.153	0.930	0.871	0.992
	26-49	1.171	1.094	1.254	1.093	1.011	1.182	1.054	0.976	1.138	0.783	0.734	0.834
	50-64	1.036	0.958	1.121	1.044	0.961	1.141	1.076	0.986	1.175	0.894	0.831	0.962
	65-99 (Ref)												
Marital status	Single/never married	0.935	0.901	0.971	0.907	0.870	0.947	0.888	0.852	0.925	1.239	1.197	1.283
	Divorced/separated/widowed	1.370	1.294	1.452	0.944	0.881	1.012	0.812	0.757	0.871	0.882	0.830	0.937
	Married/living with partner (Ref)												
Education	Completed elementary	6.568	5.854	7.369	2.296	2.075	2.541	0.943	0.870	1.021	0.189	0.176	0.202
	Secondary-3-year Tertiary	3.297	2.935	3.705	1.743	1.572	1.931	0.987	0.911	1.070	0.435	0.406	0.465
	Four years of over high school (Ref)												
Employment	Unemployed	1.948	1.829	2.075	1.280	1.189	1.377	0.782	0.723	0.846	0.466	0.433	0.502
	Out of workforce	0.930	0.892	0.970	0.975	0.930	1.022	0.928	0.887	0.970	1.138	1.096	1.181
	Employed part time	1.524	1.454	1.596	1.221	1.158	1.288	0.916	0.868	0.967	0.595	0.567	0.625
	Employed full time (Ref)												
Per capita income quintile	Poorest 20%	2.994	2.828	3.169	1.788	1.677	1.906	0.905	0.850	0.962	0.257	0.243	0.272
	Second 20%	2.199	2.075	2.330	1.626	1.524	1.735	1.017	0.957	1.081	0.383	0.364	0.403
	Middle 20%	1.778	1.676	1.886	1.470	1.377	1.570	1.079	1.016	1.146	0.493	0.469	0.519
	Fourth 20%	1.381	1.300	1.476	1.337	1.251	1.429	1.091	1.027	1.159	0.647	0.615	0.679
	Richest 20% (Ref)												
Corruption rates	0 (Lowell & Findlay)	0.869	0.830	0.909	1.041	0.988	1.097	1.003	0.952	1.057	1.109	1.062	1.159
	50 (Moderate)	0.841	0.803	0.881	1.012	0.960	1.068	1.142	1.085	1.202	1.059	1.012	1.107
	100 (High) (Ref)												
Confidence in national government	No	0.962	0.927	0.997	1.022	0.980	1.066	0.994	0.954	1.035	1.027	0.991	1.064
	Yes (Ref)												

Reference: Data analysis of the Gallup survey, 2017

Findings from the unadjusted and adjusted binary logistic regression analyses between the food security level of the FIES and receiving remittances by controlling covariates within regions are presented in Tables 7 and 8 (refer to the appendix).

The results of the unadjusted binary logistic regressions in Table 7 show that in sub-Saharan Africa non-remittance receiver households were more likely to be severely food insecure compared to those that received remittances (OR=2.080; P=0.000). In terms of socio-economic factors, the probability of being severely food insecure increased among people living in rural

areas (OR=1.459; P=0.000), with low education level (OR=2.998; P=0.000), situated in the poorest 20% (OR=2.544; P=0.000), and unemployed (OR= 4.194; P=0.000).

Findings from the unadjusted regression analyses in the Middle East and North Africa showed that receiving remittances makes no difference for severe food insecurity. However, non-receiver households were more likely to be mildly food insecure (OR=0.690; P=0.000). Similar to SSA, socio-economic characteristics included living in rural areas (OR=1.191; P=0.000), having low education (OR=5.730; P=0.000), being in the poorest 20% income quintile (OR=6.217; P=0.000), and being unemployed (OR=2.589; P=0.000) were significantly associated with severe food insecurity.

Similar findings were obtained from Latin America and the Caribbean. Although no significant relation was observed between being severely food insecure and receiving remittances, remittances made a difference for food security status. Results for LAC showed that non-remittance receiver households reported being food secure (OR=1.222; P=0.000). As with the last findings, socio-economic factors were significantly related to severe food insecurity.

Results of the unadjusted regression analyses in Asia (Southeast, South, and East) showed that, as in SSA, non-remittance receivers were more likely to be severely food insecure (OR=1.384; P=0.000). Also, socio-economic factors were significantly related to severe food insecurity.

Results of the unadjusted analyses in the Commonwealth of Independent States demonstrated that socio-economic factors were significantly associated with severe food insecurity among people living in rural areas (OR=2.072; P=0.000), with low education level (OR=5.678; P=0.000), situated in the poorest 20% (OR=7.065; P=0.000), and unemployed (OR=1.375; P=0.000). However, no significant association was observed between the four levels of the FIES and receiving remittances.

The results of the adjusted binary logistic regressions in Table 8 show that in sub-Saharan Africa no significant difference was observed between receiving remittances and severe food insecurity. Factors such as living in rural areas (OR=1.681; P=0.000), being in the poorest 20% income per capita (OR=6.233; P=0.000), having low education (OR=4.142; P=0.000), and being unemployed (OR=3.346; P=0.000) remained significantly related to severe food insecurity.

Results of the adjusted regression analyses in the Middle East and North Africa demonstrated that although no significant association was observed between receiving remittances and severe food insecurity, factors such as low education level (OR= 4.392; P=0.000), poorest 20% (OR=3.753; P=0.000), and unemployed (OR=1.862; P=0.000) were significantly associated with severe food insecurity.

In the adjusted model, receiving remittances was significantly associated with severe food insecurity in Latin America and the Caribbean. Additionally, socio-economic characteristics such as living in rural areas (OR=1.317; P=0.000), having low education (OR=5.315; P=0.000), being in the poorest 20% quintile (OR=4.276; P=0.000), and being unemployed (OR=1.948; P=0.000) were observed to be significantly related to severe food insecurity.

Results of the adjusted model in Asia (Southeast, South, and East) demonstrated that socio-economic factors, except the area of residence, were significantly related to severe food insecurity. Specifically, low education (OR=2.539; P=0.000), poorest 20% income quintile (OR=3.891; P=0.000), and unemployment (OR=1.795; P=0.000) increased the probability of being severely food insecure.

Results from the adjusted analyses in the Commonwealth of Independent States showed that non-remittance receiver households were significantly associated with severe food insecurity (OR=1.839; P=0.000). Living in rural areas (OR=1.189; P=0.000), having low education level

(OR=2.275; P=0.000), being in the poorest 20% income quintile (OR=2.293; P=0.000), and being unemployed (OR=1.530; P=0.000) increased the probability of being severely food insecure.

The multinomial logistic regression between the four levels of the FIES and receiving remittances are presented in Table 9. Apart from the four-level analyses of the FIES in the binary form, the four levels of the FIES and receiving remittances were calculated together with receiving remittances. Results of a multinomial regression analysis demonstrated that not receiving remittances increased the probability of severe food insecurity.

Table 9. Multinomial logistic regression analysis between the FIES (four levels) and receiving remittances (n=68,463)

				95% CI	
			Odds ratio	Low	High
Severely food insecure	Receiving remittances	No	1.421	1.288	1.567
		Yes (Ref)			
Moderately food insecure	Receiving remittances	No	0.944	0.855	1.042
		Yes (Ref)			
Mildly food insecure	Receiving remittances	No	0.868	0.790	0.955
		Yes (Ref)			
Food secure (Ref)					

Reference: Data analysis of the Gallup survey, 2017

The unadjusted binary regression analyses for the determinants of remittances are reported in Table 10. Apart from the factors associated with the food security level of the FIES, the unadjusted binary regression analyses, regardless of region, were calculated for the determinants of receiving remittances. The findings indicate that the probability of receiving remittances decreased among households in rural areas (OR=0.767; P=0.000), being in the poorest 20% income quintile (OR=0.416; P=0.000), having low education level (OR=0.670; P=0.000), and being unemployed (OR=1.308; P=0.000). Specifically, the probability of receiving remittances decreased with a low corruption index (OR=0.852; P=0.000) but increased among individuals who had no confidence in national government (OR=1.325; P=0.000).

Table 10. Unadjusted binary logistic regression analyses of receiving remittances and explanatory factors (n=68,463)

			95% CI	
		Odds ratio	Low	High
Area of residence	Rural	0.767	0.715	0.823
	Urban (Ref)			
Per capita income quintile	Poorest 20%	0.416	0.370	0.467
	Second 20%	0.560	0.503	0.623
	Middle 20%	0.644	0.581	0.714
	Fourth 20%	0.770	0.697	0.850
	Richest 20%			
Education	Completed elementary	0.670	0.588	0.763
	Secondary-3-year Tertiary	0.839	0.737	0.955
	Four years of over high school (Ref)			
Employment	Unemployed	1.308	1.147	1.492
	Out of workforce	1.126	1.036	1.224
	Employed part time	1.294	1.175	1.424
	Employed full time (Ref)			
Corruption index	0 (Lowell & Findlay)	0.852	0.775	0.937
	50 (Moderate)	1.079	0.985	1.183
	100 (High) (Ref)			
Confidence in national government	No	1.325	1.233	1.425
	Yes (Ref)			

Reference: Data analysis of Gallup survey, 2017

The adjusted binary logistic regression analyses between receiving remittances and some factors within regions are presented in Table 11 (refer to the appendix). The results showed that people living in rural areas in SSA and LAC were less likely to receive remittances. Interestingly, people living in rural areas in MENA and Asia were more likely to receive remittances. However, no significant association was found between the area of residence and receiving remittances for the CIS. Only in SSA and LAC receiving remittances was significantly related to education levels. Notably, respondents with low education were less likely to receive remittances. In terms of employment status, in SSA, MENA, and LAC, unemployed or out-of-work individuals were more likely to receive remittances from outside. However, part-time employed respondents from all the regions were more likely to receive remittances. Within all regions, the poorest 20% income quintile households were less likely to receive remittances from outside the country.

Apart from global and regional analyses, the results for ten countries within the five regions are presented in Tables 12 and 13 (refer to the appendix). For each of the five regions, two countries

were selected according to the highest and lowest contributions of remittances to GDP based on the findings of the (World Bank, 2019b).

The unadjusted regression analyses between the FIES and receiving remittances within the ten countries in Table 12 showed that receiving no remittances was negatively associated with food security for Liberia (OR=0.256; P=0.000), South Africa (OR=0.285; P=0.000), Yemen (OR=0.618; P=0.000), Haiti (OR=0.424; P=0.000), and Nepal (OR=0.685; P=0.000). Results from the unadjusted model indicated that receiving no remittances was related to moderate food insecurity in Liberia (OR=0.507; P=0.000), Yemen (OR=1.890; P=0.000), Haiti (OR=0.463; P=0.000), and Nepal (OR=2.585; P=0.000). Apart from food security and moderate food insecurity from the unadjusted model, the results showed that receiving no remittances was related to severe food insecurity only in Liberia (OR=2.851; P=0.000) and Haiti (OR=2.232; P=0.000). However, the results of moderate and severe food insecurity were not applicable (NA) for India and Kazakhstan because of the small samples from those countries.

The adjusted regression analyses between the FIES and receiving remittances in the ten countries are shown in Table 13 (refer to the appendix). The findings showed that receiving remittances was significantly associated with food security in Liberia (OR=0.325; P=0.000), However, for the other countries this association was not significant. In terms of the area of residence, the findings from the adjusted model showed that people living in the rural area were more likely to be severely food insecure in Haiti (OR=1.746; P=0.000). Interestingly, the poorest 20% income per capita for all countries was significantly associated with severe food insecurity, except in Haiti and Yemen.

4.2 Discussion

Because little is known about the topic, the main purpose of this study was to investigate the linkage between receiving remittances and individuals' food security status in the Global South (GS) regions. Although there are some studies on different countries that explore the association between receiving remittances and food quality and quantity consumption or food consumption expenditure, this study is the first that studies the association between food security and receiving remittances through using the Food Insecurity Experience Scale (FIES) applied to the GS. As an individual-based index, this tool contains eight items with "yes" or "no" answers, focusing on the access dimension of food security.

Findings from descriptive analyses showed that sub-Saharan Africa (SSA) has the highest prevalence of food insecure individuals compared to other regions. Results from this study are corroborated by findings from the FAO et al. (2018) that report more than 300 million people in sub-Saharan Africa were severely food insecure in 2017. Regarding causes, many factors, such as climate change, farm productivity and access to soil amendments, labor availability, and family income, influence food insecurity in SSA (Mendum & Njenga, 2018).

In Latin America and the Caribbean (LAC), although substantial progress has been made on the social and economic fronts, large segments of the population, more than 39 million or 6.1% of the population, were undernourished in 2017 (FAO et al., 2018). Findings of the current study indicated that more than 20% of the sample from LAC reported being severely food insecure in 2017. Factors influencing food security in LAC include "increased poverty and unemployment, increased food prices, changes in food consumption models, health risks, the recurrence of natural disasters" and climate change, which affects crop yields and local economies (Blanco, 2011, p. 1; FAO et al., 2016).

A recent Food and Agriculture Organization (FAO, 2017c) report classified the Middle East and North Africa (MENA) countries into different categories, such as conflict countries and non-conflict countries. According to the FAO, it is estimated that the level of severe food insecurity in conflict countries doubled in comparison to the prevalence of severe food insecurity in non-conflict countries (FAO, 2017c). In the current study, based on the FAO (2017c) classification, all of the MENA countries except Yemen were categorized as non-conflict countries. Findings from the current study revealed that only 12% of individuals in the MENA region were severely food insecure.

According to the FAO et al. (2018), although more than 515 million or 11.4% of the population were undernourished in Asia in 2017, in reference to Fiji (2018), there has been considerable improvement in the food security and nutritional status in this region. Notably, the quantity as well as the quality of diets have improved over the past decades. In Asia, during recent years, the flows of international financial resources, such as loans, portfolio equity, remittances, and foreign direct investment, have been increasing rapidly (International Conference on Asian Food Security (ICAFS), 2014). Further, based on the recent changes, such as "developments of agriculture, covering crops, livestock, fisheries, and forestry," the availability of and access to food have improved (Fiji, 2018, p. 1). Findings from the current study indicated that in Asia (South, Southeast, and East) only 12% of individuals were severely food insecure.

In the present study, the findings showed that the Commonwealth of Independent States (CIS), including Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan was more food secure. According to Meade and Thome (2017), CIS countries are among the countries with relatively high per capita income that are more likely to achieve moderate growth in the next decade.

Available evidence shows that remittances have significant positive effects on the food security status of developing countries (Leliveld, 1997; Regmi, Paudel, & Williams, 2014; Regmi & Paudel, 2016; Szabo, et al., 2018). Notably, Combes and Ebeke (2011) argue that remittances decrease household consumption instability and function as a hedge against countries that face natural disasters, agricultural shocks, and banking crises. Further, receiving remittances can act effectively on households' expenditures on food. Specifically, Adams and Cuecuecha (2010a) found that remittance-receiving households had an 8.5% increase in their average budget share in consumption expenditure on food (i.e., purchased or non-purchased foods) compared to non-remittance receivers. However, Perakis (2011), in a study on Mali, found that food consumption was better insured among migrant households. Remittances as additional income reduced household economic shocks which can "smooth" food consumption but did not increase food expenditure. In the current study, a significant association was observed between receiving remittances and the food security status of individuals (both crosstabs and regression analyses) in the GS. The findings revealed that not receiving remittances increases the severity of food insecurity and decreases food security status.

Apart from the global perspective, all logistic regression analyses were carried out for the five regions: Sub-Saharan Africa (SSA), the Middle East and North Africa (MENA), Latin America and the Caribbean (LAC), Asia (Southeast, South, and East), and the Commonwealth of Independent States (CIS). Findings from this study showed that in the unadjusted and adjusted logistic regression analyses, the likelihood of being severely food insecure was significant in SSA, Asia, and CIS for individuals who did not receive remittances from migrants.

However, available evidence shows that East Asia/the Pacific and South Asia received more remittances (in billions of dollars), and people from SSA received fewer remittances compared to

other regions (World Bank, 2018b). Reforming the remittance market might create economic benefits for the poorer ASEAN (Association of Southeast Asian Nations) (Leong, 2017). International remittances generate three times more money annually than all foreign aid and give families basic necessities (World Bank, 2018b). It should be noted that the difference between the methodology of the findings in the current study and that of the World Bank (2018b) is that the results of this study used remittances based on percentages (money and goods), while the World Bank's remittances are based on the volume of flows of remittances (in billions of dollars).

In the CIS, like SSA and Asia, not receiving remittances increased the probability of being severely food insecure. At the end of 2016, the CIS countries began to enjoy more favorable external economic conditions, including considerable increases in commodity prices, and there was an economic recovery with the region's key trading partners, a key driver of remittance flows and trade for the CIS economies. These favorable external factors increased economic activity and food security in the CIS through their impact on export earnings, remittance flows, and investments from the region's main economic partners (Akramov, Ilyasov, & Park, 2018).

In the MENA region, not receiving remittances only had a significant association with mild food insecurity, which was slightly increased. In other words, the probability of experiencing uncertainty about access to food and restrictions on the quality of the diet (mild food insecurity) increased slightly for individuals not receiving remittances from outside. Also, the results of this study showed that non-remittance receivers were more likely to be food secure in LAC. Although remittance flows have important effects in developing countries, it seems that there are specific programs supported by governments in these regions that alleviate hunger as well as food insecurity. For instance, in the MENA region, some countries have better social protection systems that are well designed and more efficient in fighting poverty (FAO, 2017b). As in the MENA

region, in Latin America and the Caribbean the population has been covered by conditional cash transfer programs over the past 20 years in exchange for fulfilling certain health and social obligations. In fact, these programs are the primary instruments to reduce poverty, protect poor families, and help children and young people to have better nutrition, health, and education (Cecchini & Atuesta, 2017).

Results from the adjusted models showed that socio-demographic factors, such as the area of residence, education, employment status, and income quintile, were strongly significantly related to food security at the regional level. As a result, this study found that receiving remittances seems to indirectly influence the food security status of individuals in the GS regions. The findings from this study have been corroborated by other available studies. Compared to urbanites, people in rural areas comprise the majority of the food insecure in developing countries (Smith, Kassa, & Winters, 2017). A low level of education contributes to food insecurity status (Bruening, MacLehose, Loth, Story, & Neumark-Sztainer, 2012). Being unemployed is among the determinants of food insecurity in a population (Birkenmaier, Huang, & Kim, 2016). Household food insecurity is explained by changes in the national unemployment rate, as well (Nord, Coleman-Jensen, & Gregory, 2014). Income plays a considerable role in households' food security status. Food secure households are less likely to provide an indication of any income-related problems (Tarasuk, Mitchell, & Dachner, 2016).

Apart from the determinants of food security status, factors that are related to receiving remittances were also analyzed. For instance, a negative linkage was observed between receiving remittances and the corruption index. The literature explains that remittance-receiver households that have access to public resources have very little motivation "to hold a government accountable for corrupt activities" (Berdiev, Kim, & Chang, 2013, p. 182). The current study found that

remittance-receiver households reported had no confidence in national government. Compared to developing countries, the developed countries, through providing insurance and credit markets, minimize household risks. There is no specific program to support families in developing countries. Therefore, the household "can rely on migrant remittances for support" when productive activities fail to bring enough income to the household (Massey et al., 1993, p. 436). Also, according to the New Economics of Migration Theory, the decision to migrate is a collective decision made by households, families, or communities (Azam & Gubert, 2006; Mlambo, 2017). This theory argues that sending and receiving remittances are the important aims for migrants and families (Kubursi, 2006).

Apart from global as well as regional levels, unadjusted and adjusted statistical analyses were also done for ten countries within all regions. For each of the five regions, two countries were selected according to the highest and lowest contributions of remittances to GDP based on the findings of the (World Bank, 2019b). According to the World Bank (2019a), GDPs (current US$ millions) and the World Bank (2019b) for each country, it was revealed that among the countries with a large economy and GDP, the proportional contributions of remittances to GDP were lower, as expected. For example, while in Nepal the country's GDP is relatively low ($ 24,880.27 US) the contribution of remittances to GDP is high (28%). In contrast, in India the country's GDP is much higher ($ 2,600,818.24 US) with a very low relative contribution of remittances (2.7%). There is a similar relationship between remittances and GDP for the other countries (refer to Table 14 in the appendix). It has been stated that receiving remittances affects human well-being and provides necessary support for increasing economic growth, gross domestic product (GDP), and development while reducing poverty in many developing countries (Banga & Sahu, 2010; Lubambu, 2014; Siddique, Shehzadi, Manzoor, & Majeed, 2016). In developing countries, inflows

of remittances contribute to at least 4% of the gross domestic product (GDP). This can lead to a considerable slowdown in high food prices for household food consumption (Combes, Ebeke, Etoundi, & Yogo, 2012; Combes, Ebeke, Etoundi, & Yogo, 2014). Therefore, declining inflows of remittances to vulnerable countries can create an economic burden on people as well as governments (Chami, Hakura, & Montiel, 2009). The results for the single countries within all regions indicated that in Liberia, Yemen, Haiti, and Nepal not receiving remittances was significantly related to moderate and severe food insecurity (restrictions in access to food affect the quantity of food and hunger is experienced). On the other hand, in these four countries and in South Africa, not receiving remittances was negatively associated with being food secure.

Also, the results for the adjusted regression showed that in Liberia and Haiti, where the prevalence of severe food insecurity was 64% and 71%, respectively (FAO, 2016), not receiving remittances increased the probability of severe food insecurity. However, based on the findings of the World Bank (2019c), the flows of remittances to Liberia were estimated to be $ 403,475.87 US. By contrast Haiti, with a larger economy and GDP, received a larger number of remittances ($ 2,721,841.07 US) (refer to Table 14 in the appendix). However, the results of the adjusted regression of the current study showed that people living in rural areas in Haiti were more likely to be severely food insecure. In addition, the poorest 20% income quintile for all countries except Haiti and Yemen was significantly associated with severe food insecurity.

To sum up, this study is not a country-by-country study, and there are large differences in the economic and food security status of the countries in each region. Thus, receiving remittances seems to make a different contribution to the food security status in each country.

Chapter 5: Final Conclusion

It should be noted that remittances are one of the most important factors contributing to the economic, social and political aspects of the lives of individuals in developing countries. As noted in the above chapters, the effects of remittances are seen on both the macro and micro levels. Apart from the macro impacts, receiving remittances at the micro level provides stable incomes for migrant relatives in their home countries by lessening financial constraints, smoothing consumption, encouraging investment, and supporting migrant relatives in times of economic shock and crises. Further, in line with the literature, receiving remittances seems to have a positive impact on human capital, agricultural production, business/self-employment, and food security status among individuals.

The main purpose of this study was to investigate the linkage between receiving remittances and individuals' food security status in the Global South (GS) regions. This is the first research project assessing such relationship in GS using representative samples of individuals. Remittances, as one of the coping strategies in alleviating food insecurity, operate through providing stable incomes for migrant relatives in their home countries. However, this study found no direct association between receiving remittances and food security in every region in the GS. Importantly, factors such as household income, education, employment status, and the area of residence remained the major drivers of food security status in these regions.

The results for some single countries within all the regions in this study indicated that in Liberia, South Africa, Yemen, Haiti, and Nepal not receiving remittances was significantly related to the food security status of individuals. This means that in these countries the probability of being food secure decreased for individuals who did not receive remittances from outside the country.

One strength of this study is the large volume of data from the GS used in this study. The Gallup World Poll (GWP) collects data from the majority of countries worldwide. Also, using a standard indicator, the Food Insecurity Experience Scale (FIES), is another strength of the current study.

One limitation of this study is that it focuses only on the association between receiving remittances and the food security status of individuals in the GS. However, analyzing the linkages between receiving remittances and quantity/quality of foods (e.g., calorie consumption, dietary diversity) in the GS is recommended for future research. In this study, self-reports on receiving remittances in percentages were used, but assessing the use of remittances is recommended for future research. Also, this contribution is a quantitative cross-sectional study. For future research, a qualitative approach should be incorporated in order to generate a conceptual framework to better understand migrants' mechanisms of sending remittances to their countries of origin, among other several pending questions. Still, the findings of this study elucidate the importance of remittances in coping with one of the most important challenges faced in the GS, food insecurity.

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Appendix 1

Table 7. Unadjusted binary logistic regression analyses between the FIES and receiving remittances and covariates within regions (n=68,463)

			Severely FIS			Moderately FIS			Mildly FIS			Food Secure		
				95% CI			95% CI			95% CI			95% CI	
Regions			Odds ratio	Low	High	Odds ratio	Low	High	Odds ratio	Low	High	Odds ratio	Low	High
Sub-Saharan Africa	Receiving remittances	No	2.080	1.825	2.370	0.845	0.733	0.975	0.712	0.609	0.831	0.500	0.430	0.581
		Yes (Ref)												
	Area of residence	Rural	1.459	1.380	1.542	0.912	0.855	0.973	0.847	0.812	0.941	0.629	0.583	0.678
		Urban (Ref)												
	Education	Completed elementary	2.998	2.515	3.575	1.137	0.937	1.379	0.582	0.483	0.701	0.280	0.235	0.333
		Secondary-3-year Tertiary	2.069	1.732	2.473	1.169	0.961	1.423	0.650	0.538	0.786	0.510	0.428	0.607
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	2.544	2.349	2.574	1.095	0.997	1.202	0.538	0.481	0.601	0.258	0.228	0.291
		Second 20%	1.997	1.846	2.161	1.137	1.036	1.247	0.726	0.655	0.806	0.331	0.295	0.370
		Middle 20%	1.748	1.616	1.891	1.067	0.971	1.117	0.814	0.735	0.901	0.448	0.404	0.497
		Fourth 20%	1.365	1.261	1.477	1.215	1.108	1.332	0.894	0.809	0.988	0.554	0.502	0.612
		Richest 20% (Ref)												
	Employment status	Unemployed	4.194	2.760	6.373	1.750	1.224	2.501	1.067	0.784	1.451	0.424	0.320	0.562
		Out of workforce	1.056	0.752	1.483	0.768	0.607	0.970	0.816	0.688	0.968	1.284	1.106	1.490
		Employed part time	1.007	0.616	1.647	1.179	0.867	1.603	1.122	0.887	1.418	0.846	0.685	1.043
		Employed full time (Ref)												
Middle East and North Africa	Receiving remittances	No	1.216	0.819	1.805	1.262	0.899	1.770	0.690	0.524	0.909	1.053	0.832	1.333
		Yes (Ref)												
	Area of residence	Rural	1.191	1.020	1.392	1.138	0.995	1.301	1.197	1.050	1.365	0.770	0.695	0.853
		Urban (Ref)												
	Education	Completed elementary	5.730	3.707	8.858	2.415	1.818	3.208	1.630	1.270	2.091	0.238	0.195	0.290
		Secondary-3-year Tertiary	2.364	1.520	3.676	1.543	1.161	2.051	1.086	0.846	1.393	0.618	0.509	0.751
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	6.217	4.581	8.436	4.021	3.166	5.107	1.279	1.036	1.579	0.173	0.145	0.207
		Second 20%	3.764	2.743	5.163	2.984	2.337	3.811	1.220	0.987	1.509	0.320	0.270	0.380
		Middle 20%	2.604	1.875	3.617	2.257	1.755	2.902	1.215	0.983	1.503	0.455	0.384	0.539
		Fourth 20%	1.776	1.256	2.511	1.444	1.105	1.887	1.196	0.966	1.479	0.661	0.557	0.785
		Richest 20% (Ref)												
	Employment status	Unemployed	2.589	1.962	3.415	2.843	2.235	3.615	0.970	0.751	1.253	0.329	0.266	0.407
		Out of workforce	1.675	1.382	2.031	1.625	1.378	1.917	0.927	0.799	1.074	0.662	0.589	0.744
		Employed part time	1.356	0.971	1.894	1.830	1.400	2.390	1.089	0.842	1.407	0.609	0.494	0.749
		Employed full time (Ref)												
Latin America and the Caribbean	Receiving remittances	No	0.971	0.830	1.136	0.765	0.650	0.900	0.980	0.835	1.150	1.222	1.069	1.398
		Yes (Ref)												
	Area of residence	Rural	1.677	1.552	1.813	1.308	1.201	1.424	1.021	0.944	1.105	0.584	0.546	0.623
		Urban (Ref)												
	Education	Completed elementary	8.274	6.597	10.37	2.637	2.184	3.183	0.874	0.759	1.006	0.221	0.196	0.249
		Secondary-3-year Tertiary	3.689	2.940	4.627	1.996	1.657	2.045	1.118	0.978	1.278	0.420	0.375	0.470
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	6.160	5.330	7.121	2.209	1.903	2.564	1.035	0.911	1.176	0.186	0.166	0.208
		Second 20%	3.643	3.139	4.227	2.403	2.073	2.785	1.151	1.015	1.305	0.282	0.252	0.313
		Middle 20%	2.602	2.233	3.032	2.155	1.856	2.502	1.168	1.031	1.324	0.390	0.352	0.433
		Fourth 20%	1.874	1.598	2.196	1.479	1.264	1.731	1.203	1.062	1.363	0.574	0.518	0.635
		Richest 20% (Ref)												
	Employment status	Unemployed	2.477	2.179	2.816	1.441	1.245	1.668	0.882	0.761	1.022	0.380	0.332	0.435
		Out of workforce	1.106	1.005	1.217	0.910	0.819	1.011	0.884	0.805	0.971	1.069	0.991	1.154
		Employed part time	1.363	1.225	1.516	1.218	1.086	1.366	0.998	0.897	1.111	0.718	0.656	0.786
		Employed full time (Ref)												
Asia (Southeast, South, and East)	Receiving remittances	No	1.384	1.063	1.802	1.059	0.867	1.294	0.789	0.668	0.933	1.036	0.884	1.215
		Yes (Ref)												
	Area of residence	Rural	1.475	1.302	1.671	1.634	1.469	1.817	1.112	1.021	1.211	0.597	0.554	0.644
		Urban (Ref)												
	Education	Completed elementary	3.729	2.687	5.175	2.825	2.224	3.587	1.273	1.080	1.499	0.311	0.269	0.360
		Secondary-3-year Tertiary	1.940	1.875	2.716	1.588	1.241	2.032	1.025	0.866	1.214	0.690	0.594	0.801
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	5.031	4.175	6.063	2.901	2.512	3.351	1.146	1.017	1.291	0.227	0.203	0.254
		Second 20%	3.659	3.023	4.429	2.031	1.750	2.358	1.210	1.074	1.362	0.369	0.332	0.411
		Middle 20%	2.057	1.679	2.522	1.853	1.594	2.153	1.317	1.171	1.481	0.483	0.435	0.537
		Fourth 20%	1.353	1.088	1.682	1.584	1.359	1.847	1.193	1.060	1.343	0.655	0.590	0.727
		Richest 20% (Ref)												
	Employment status	Unemployed	1.732	1.404	2.135	1.228	1.009	1.495	1.008	0.843	1.204	0.636	0.536	0.755
		Out of workforce	0.987	0.883	1.104	0.936	0.852	1.029	0.893	0.823	0.968	1.145	1.065	1.232
		Employed part time	1.050	0.894	1.233	1.247	1.095	1.421	1.038	0.923	1.167	0.818	0.734	0.912
		Employed full time (Ref)												
Commonwealth of Independent States	Receiving remittances	No	1.166	0.623	2.181	0.711	0.484	1.045	0.942	0.693	1.282	1.184	0.903	1.553
		Yes (Ref)												
	Area of residence	Rural	2.072	1.423	3.018	1.343	1.058	1.703	0.922	0.781	1.089	0.824	0.711	0.955
		Urban (Ref)												
	Education	Completed elementary	5.678	2.626	12.275	1.747	1.200	2.545	1.346	1.024	1.769	0.490	0.387	0.621
		Secondary-3-year Tertiary	4.435	2.104	9.346	1.562	1.111	2.194	1.534	1.208	1.947	0.497	0.404	0.612
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	7.065	4.029	12.390	3.235	2.299	4.554	1.698	1.328	2.171	0.261	0.210	0.324
		Second 20%	2.690	1.458	4.965	2.083	1.454	2.985	1.628	1.271	2.086	0.455	0.366	0.566
		Middle 20%	2.974	1.620	5.459	1.822	1.261	2.633	1.553	1.209	1.995	0.491	0.394	0.611
		Fourth 20%	1.682	0.865	3.272	1.313	0.877	1.942	1.526	1.186	1.905	0.620	0.496	0.775
		Richest 20% (Ref)												
	Employment status	Unemployed	1.375	1.254	1.507	0.980	0.878	1.093	0.711	0.619	0.817	0.710	0.612	0.823
		Out of workforce	0.879	0.826	0.934	0.973	0.904	1.047	1.035	0.952	1.125	1.286	1.181	1.401
		Employed part time	1.031	0.968	1.098	1.046	0.971	1.128	1.021	0.936	1.113	0.847	0.770	0.932
		Employed full time (Ref)												

Reference: Data analysis of the Gallup survey, 2017

Table 8. Adjusted binary logistic regression analyses between the FIES and receiving remittances and covariates within regions (n=68,463)

			Severely FIS			Moderately FIS			Mildly FIS			Food Secure		
				95% CI			95% CI			95% CI			95% CI	
Regions			Odds ratio	Low	High	Odds ratio	Low	High	Odds ratio	Low	High	Odds ratio	Low	High
Sub-Saharan Africa	Receiving remittances	No	1.060	0.557	2.017	0.667	0.450	0.989	0.921	0.675	1.257	1.263	0.954	1.673
		Yes (Ref)												
	Area of residence	Rural	1.681	1.085	2.606	1.077	0.821	1.413	0.804	0.668	0.967	1.076	0.908	1.276
		Urban (Ref)												
	Education	Completed elementary	4.142	1.653	10.380	1.587	1.031	2.444	1.274	0.941	1.725	0.559	0.427	0.733
		Secondary-3-year Tertiary	3.252	1.339	7.901	1.213	0.820	1.794	1.436	1.105	1.865	0.613	0.484	0.776
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	6.233	3.223	12.054	2.919	1.982	4.298	1.684	1.282	2.212	0.279	0.219	0.356
		Second 20%	2.223	1.089	4.534	1.984	1.328	2.962	1.638	1.248	2.149	0.483	0.380	0.616
		Middle 20%	2.646	1.035	5.364	1.572	1.039	2.378	1.680	1.282	2.202	0.507	0.398	0.647
		Fourth 20%	1.584	0.726	3.456	1.276	0.830	1.960	1.572	1.200	2.058	0.616	0.483	0.786
		Richest 20% (Ref)												
	Employment status	Unemployed	3.346	2.098	5.334	1.911	1.304	2.801	0.992	0.709	1.387	0.410	0.296	0.567
		Out of workforce	0.825	0.564	1.207	0.713	0.548	0.929	0.771	0.640	0.928	1.479	1.251	1.749
		Employed part time	0.812	0.479	1.337	0.908	0.639	1.289	1.083	0.845	1.389	1.024	0.814	1.289
		Employed full time (Ref)												
Middle East and North Africa	Receiving remittances	No	1.131	0.754	1.697	1.209	0.854	1.711	0.682	0.515	0.902	1.109	0.863	1.426
		Yes (Ref)												
	Area of residence	Rural	0.956	0.801	1.141	0.997	0.858	1.160	1.059	0.918	1.221	0.980	0.871	1.102
		Urban (Ref)												
	Education	Completed elementary	4.392	2.662	7.248	1.763	1.267	2.254	1.618	1.227	2.135	0.323	0.257	0.407
		Secondary-3-year Tertiary	2.050	1.243	3.383	1.297	0.938	1.793	1.104	0.844	1.444	0.723	0.681	0.900
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	3.753	2.666	5.283	3.346	2.543	4.402	1.324	1.045	1.678	0.245	0.201	0.299
		Second 20%	3.002	2.127	4.236	2.718	2.066	3.575	1.195	0.946	1.510	0.379	0.313	0.457
		Middle 20%	2.131	1.491	3.046	2.087	1.576	2.764	1.169	0.927	1.474	0.533	0.442	0.643
		Fourth 20%	1.714	1.183	2.482	1.385	1.029	1.863	1.225	0.974	1.540	0.681	0.565	0.822
		Richest 20% (Ref)												
	Employment status	Unemployed	1.862	1.353	2.562	2.582	1.971	3.382	0.925	0.699	1.224	0.411	0.324	0.521
		Out of workforce	1.187	0.959	1.469	1.456	1.209	1.755	0.833	0.709	0.980	0.883	0.773	1.010
		Employed part time	0.969	0.669	1.403	1.539	1.144	2.071	1.019	0.776	1.338	0.805	0.638	1.017
		Employed full time (Ref)												
Latin America and the Caribbean	Receiving remittances	No	0.787	0.666	0.929	0.701	0.593	0.827	0.976	0.831	1.146	1.495	1.295	1.726
		Yes (Ref)												
	Area of residence	Rural	1.317	1.209	1.436	1.170	1.067	1.282	1.037	0.954	1.128	0.725	0.674	0.780
		Urban (Ref)												
	Education	Completed elementary	5.315	4.154	6.800	1.997	1.628	2.450	0.846	0.824	0.988	0.338	0.296	0.386
		Secondary-3-year Tertiary	2.621	2.052	3.348	1.571	1.288	1.917	1.090	0.944	1.259	0.581	0.513	0.658
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	4.276	3.637	5.028	1.976	1.673	2.334	1.135	0.985	1.308	0.240	0.212	0.271
		Second 20%	2.802	2.380	3.298	2.182	1.856	2.564	1.217	1.062	1.394	0.337	0.300	0.378
		Middle 20%	2.106	1.783	2.487	2.004	1.706	2.355	1.229	1.076	1.405	0.446	0.399	0.499
		Fourth 20%	1.638	1.380	1.945	1.571	1.288	1.688	1.219	1.069	1.391	0.629	0.564	0.701
		Richest 20% (Ref)												
	Employment status	Unemployed	1.948	1.689	2.247	1.148	0.979	1.346	0.872	0.746	1.019	0.529	0.457	0.613
		Out of workforce	0.765	0.689	0.851	0.780	0.697	0.872	0.895	0.811	0.989	1.531	1.405	1.667
		Employed part time	1.068	0.950	1.201	1.102	0.975	1.244	0.983	0.878	1.100	0.903	0.817	0.998
		Employed full time (Ref)												
Asia (Southeast, South, and East)	Receiving remittances	No	1.104	0.842	1.448	0.910	0.742	1.117	0.778	0.657	0.921	1.292	1.093	1.528
		Yes (Ref)												
	Area of residence	Rural	0.948	0.813	1.106	1.257	1.106	1.429	1.063	0.958	1.180	0.855	0.777	0.941
		Urban (Ref)												
	Education	Completed elementary	2.539	1.748	3.690	2.138	1.619	2.824	1.132	0.932	1.375	0.434	0.363	0.518
		Secondary-3-year Tertiary	1.487	1.015	2.177	1.420	1.069	1.886	0.968	0.795	1.179	0.812	0.679	0.972
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	3.891	3.126	4.844	2.600	2.191	3.087	1.056	0.914	1.219	0.268	0.233	0.307
		Second 20%	3.028	2.428	3.777	1.839	1.543	2.191	1.121	0.973	1.291	0.427	0.375	0.486
		Middle 20%	1.763	1.396	2.226	1.699	1.425	2.025	1.268	1.104	1.455	0.537	0.473	0.609
		Fourth 20%	1.143	0.889	1.470	1.565	1.310	1.871	1.211	1.055	1.390	0.677	0.598	0.767
		Richest 20% (Ref)												
	Employment status	Unemployed	1.795	1.397	2.305	1.255	0.998	1.579	0.957	0.775	1.182	0.628	0.510	0.774
		Out of workforce	0.883	0.774	1.007	0.866	0.776	0.966	0.883	0.803	0.971	1.320	1.207	1.444
		Employed part time	0.792	0.656	0.958	1.013	0.873	1.176	1.079	0.945	1.232	1.035	0.908	1.180
		Employed full time (Ref)												
Commonwealth of Independent States	Receiving remittances	No	1.839	1.608	2.105	0.848	0.734	0.980	0.752	0.642	0.881	0.614	0.524	0.720
		Yes (Ref)												
	Area of residence	Rural	1.189	1.110	1.274	0.876	0.809	0.949	1.023	0.932	1.123	0.842	0.765	0.926
		Urban (Ref)												
	Education	Completed elementary	2.275	1.820	2.844	1.205	0.940	1.545	0.728	0.572	0.926	0.359	0.288	0.448
		Secondary-3-year Tertiary	1.764	1.409	2.207	1.178	0.919	1.511	0.775	0.609	0.986	0.595	0.478	0.740
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	2.293	2.082	2.525	1.169	1.043	1.311	0.534	0.467	0.610	0.269	0.231	0.313
		Second 20%	1.781	1.620	1.958	1.266	1.132	1.416	0.690	0.609	0.783	0.367	0.320	0.421
		Middle 20%	1.665	1.515	1.829	1.106	0.987	1.238	0.822	0.728	0.928	0.456	0.401	0.518
		Fourth 20%	1.298	1.180	1.428	1.288	1.152	1.440	0.841	0.746	0.949	0.606	0.537	0.683
		Richest 20% (Ref)												
	Employment status	Unemployed	1.530	1.371	1.707	0.937	0.823	1.065	0.678	0.575	0.799	0.617	0.513	0.742
		Out of workforce	0.882	0.820	0.949	0.973	0.893	1.060	1.011	0.916	1.115	1.343	1.210	1.490
		Employed part time	1.035	0.961	1.116	1.029	0.943	1.123	1.025	0.927	1.134	0.849	0.756	0.954
		Employed full time (Ref)												

Reference: Data analysis of the Gallup survey, 2017

Table 11. Adjusted binary logistic regression analyses between receiving remittances and some factors within regions (n=68,463)

Receiving remittances

Regions	Variables		Odds ratio	95% CI Low	95% CI High
Sub-Saharan Africa	Area of residence	Rural	0.448	0.396	0.506
		Urban (Ref)			
	Income quintile	Poorest 20%	0.499	0.414	0.602
		Second 20%	0.500	0.414	0.604
		Middle 20%	0.650	0.466	0.674
		Fourth 20%	0.755	0.652	0.920
		Richest 20% (Ref)			
	Education	Completed elementary	0.389	0.286	0.528
		Secondary-3-year Tertiary	0.614	0.451	0.837
		Four years of over high school (Ref)			
	Employment	Unemployed	1.126	0.895	1.416
		Out of workforce	1.207	1.035	1.407
		Employed part time	1.251	1.070	1.464
		Employed full time (Ref)			
Middle East and North Africa	Area of residence	Rural	1.606	1.264	2.041
		Urban (Ref)			
	Income quintile	Poorest 20%	0.432	0.287	0.651
		Second 20%	0.648	0.453	0.927
		Middle 20%	0.724	0.511	1.025
		Fourth 20%	0.878	0.831	1.222
		Richest 20% (Ref)			
	Education	Completed elementary	1.355	0.867	2.119
		Secondary-3-year Tertiary	1.158	0.745	1.799
		Four years of over high school (Ref)			
	Employment	Unemployed	1.996	1.288	3.092
		Out of workforce	1.645	1.231	2.199
		Employed part time	1.692	1.064	2.692
		Employed full time (Ref)			
Latin America and the Caribbean	Area of residence	Rural	0.824	0.723	0.938
		Urban (Ref)			
	Income quintile	Poorest 20%	0.313	0.245	0.389
		Second 20%	0.699	0.578	0.845
		Middle 20%	0.698	0.577	0.843
		Fourth 20%	0.854	0.713	1.023
		Richest 20% (Ref)			
	Education	Completed elementary	0.690	0.557	0.853
		Secondary-3-year Tertiary	0.773	0.632	0.946
		Four years of over high school (Ref)			
	Employment	Unemployed	1.525	1.228	1.895
		Out of workforce	1.057	0.904	1.237
		Employed part time	1.304	1.096	1.551
		Employed full time (Ref)			
Asia (Southeast, South, and East)	Area of residence	Rural	1.216	1.019	1.453
		Urban (Ref)			
	Income quintile	Poorest 20%	0.347	0.267	0.449
		Second 20%	0.384	0.300	0.492
		Middle 20%	0.608	0.490	0.755
		Fourth 20%	0.549	0.439	0.685
		Richest 20% (Ref)			
	Education	Completed elementary	0.853	0.636	1.145
		Secondary-3-year Tertiary	0.929	0.696	1.241
		Four years of over high school (Ref)			
	Employment	Unemployed	1.282	0.895	1.837
		Out of workforce	0.997	0.838	1.187
		Employed part time	1.472	1.170	1.850
		Employed full time (Ref)			
Commonwealth of Independent States	Area of residence	Rural	1.304	0.955	1.780
		Urban (Ref)			
	Income quintile	Poorest 20%	0.635	0.410	0.985
		Second 20%	0.871	0.581	1.306
		Middle 20%	0.914	0.609	1.370
		Fourth 20%	1.135	0.770	1.674
		Richest 20% (Ref)			
	Education	Completed elementary	1.357	0.860	2.140
		Secondary-3-year Tertiary	1.121	0.741	1.694
		Four years of over high school (Ref)			
	Employment	Unemployed	1.151	0.638	2.078
		Out of workforce	1.294	0.952	1.759
		Employed part time	1.709	1.157	2.526
		Employed full time (Ref)			

Reference: Data analysis of the Gallup survey, 2017

Table 12. Unadjusted binary logistic regression analyses between the FIES and receiving remittances within ten countries (n=9500)

Regions	Countries			Severely FIS			Moderately FIS		
				Odds ratio	Low	High	Odds ratio	Low	High
Sub-Saharan Africa	Liberia	Receiving remittances	No	2.851	1.418	4.732	0.507	0.293	0.878
			Yes (Ref)						
	South Africa	Receiving remittances	No	4.350	0.823	22.99	0.495	0.139	1.766
			Yes (Ref)						
Middle East and North Africa	Yemen	Receiving remittances	No	1.546	0.818	2.922	1.890	1.140	3.133
			Yes (Ref)						
	Egypt	Receiving remittances	No	1.513	0.408	5.611	0.985	0.412	2.354
			Yes (Ref)						
Latin America and the Caribbean	Haiti	Receiving remittances	No	2.232	1.258	3.963	0.463	0.236	0.910
			Yes (Ref)						
	Argentina	Receiving remittances	No	0.636	0.101	3.999	1.288	0.105	15.76
			Yes (Ref)						
Asia (Southeast, South, and East)	Nepal	Receiving remittances	No	1.357	0.698	2.640	2.585	1.621	4.121
			Yes (Ref)						
	India	Receiving remittances	No	NA	NA	NA	0.855	0.212	3.442
			Yes (Ref)						
Commonwealth of Independent States	Kyrgyzstan	Receiving remittances	No	1.268	0.489	3.288	0.720	0.408	1.271
			Yes (Ref)						
	Kazakhstan	Receiving remittances	No	0.428	0.072	2.551	NA	NA	NA
			Yes (Ref)						
Regions	Countries			Mildly FIS			Food Secure		
				Odds ratio	Low	High	Odds ratio	Low	High
Sub-Saharan Africa	Liberia	Receiving remittances	No	0.698	0.249	1.962	0.256	0.117	0.560
			Yes (Ref)						
	South Africa	Receiving remittances	No	5.542	0.244	1.218	0.285	0.089	0.920
			Yes (Ref)						
Middle East and North Africa	Yemen	Receiving remittances	No	0.699	0.547	1.070	0.618	0.392	0.740
			Yes (Ref)						
	Egypt	Receiving remittances	No	0.802	0.327	1.969	0.999	0.422	2.362
			Yes (Ref)						
Latin America and the Caribbean	Haiti	Receiving remittances	No	1.229	0.446	3.388	0.424	0.184	0.977
			Yes (Ref)						
	Argentina	Receiving remittances	No	0.315	0.063	1.580	3.871	0.515	29.10
			Yes (Ref)						
Asia (Southeast, South, and East)	Nepal	Receiving remittances	No	0.742	0.532	1.037	0.685	0.497	0.942
			Yes (Ref)						
	India	Receiving remittances	No	1.635	0.368	7.267	0.452	0.147	1.386
			Yes (Ref)						
Commonwealth of Independent States	Kyrgyzstan	Receiving remittances	No	0.917	0.592	1.419	1.190	0.800	1.772
			Yes (Ref)						
	Kazakhstan	Receiving remittances	No	1.166	0.417	3.266	0.774	0.304	1.972
			Yes (Ref)						

Reference: Data analysis of the Gallup survey, 2017

Table 13. Adjusted binary logistic regression analyses between the FIES and receiving remittances within ten countries (n=9500)

			Severely FIS			Moderately FIS			Mildly FIS			Food Secure		
				95% CI			95% CI			95% CI			95% CI	
Countries	Variables		Odds ratio	Low	High	Odds ratio	Low	High	Odds ratio	Low	High	Odds ratio	Low	High
Liberia	Receiving remittances	No	2.618	1.531	4.477	0.502	0.281	0.896	0.803	0.264	2.445	0.325	0.138	0.769
		Yes (Ref)												
	Area of residence	Rural	1.166	0.822	1.654	0.933	0.629	1.384	0.840	0.403	1.749	0.809	0.383	1.709
		Urban (Ref)												
	Education	Completed elementary	0.873	0.147	5.197	5.789	0.216	155.0	0.161	0.020	1.327	1.1414	0.060	21.59
		Secondary-3-year Tertiary	0.661	0.111	3.953	6.06	0.226	162.1	0.222	0.027	1.813	2.168	0.118	39.85
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	1.868	1.112	3.140	0.643	0.356	1.163	0.787	0.281	2.204	0.317	0.087	1.515
		Second 20%	1.287	0.789	2.101	0.953	0.550	1.651	0.478	0.154	1.482	0.851	0.339	2.135
		Middle 20%	1.350	0.815	2.237	0.919	0.519	1.628	0.878	0.323	2.390	0.415	0.128	1.343
		Fourth 20%	1.473	0.892	2.432	0.824	0.466	1.457	0.555	0.187	1.649	0.710	0.274	1.841
		Richest 20% (Ref)												
	Employment status	Unemployed	1.166	0.618	2.199	1.009	0.501	2.033	0.278	0.028	2.774	1.100	0.343	3.525
		Out of workforce	1.745	1.065	2.861	0.697	0.404	1.201	0.549	0.153	1.966	0.489	0.167	1.436
		Employed part time	1.078	0.747	1.554	0.860	0.568	1.303	0.549	0.153	1.966	0.606	0.275	1.338
		Employed full time (Ref)												
South Africa	Receiving remittances	No	1.634	0.268	9.952	2.328	0.223	24.26	5.309	0.228	123.6	0.235	0.051	1.078
		Yes (Ref)												
	Area of residence	Rural	0.974	0.657	1.444	0.876	0.550	1.398	1.301	0.771	2.194	0.965	0.617	1.510
		Urban (Ref)												
	Education	Completed elementary	6.428	2.123	19.46	0.896	0.312	2.567	0.475	0.181	1.252	0.341	0.412	0.822
		Secondary-3-year Tertiary	3.148	1.078	9.191	1.190	0.448	3.162	0.750	0.317	1.776	0.532	0.243	1.167
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	4.180	2.400	7.281	0.968	0.502	1.938	0.576	0.295	1.112	0.293	0.161	0.535
		Second 20%	3.389	1.954	5.879	2.069	1.119	3.827	0.717	0.385	1.337	0.112	0.053	0.235
		Middle 20%	2.272	1.293	3.993	0.752	0.368	1.536	0.948	0.518	1.737	0.599	0.350	1.023
		Fourth 20%	1.676	0.940	2.986	1.510	0.796	2.865	0.573	0.298	1.100	0.732	0.436	1.227
		Richest 20% (Ref)												
	Employment status	Unemployed	2.875	1.728	4.786	1.208	0.647	2.253	0.489	0.246	0.973	0.354	0.191	0.656
		Out of workforce	1.193	0.760	1.872	1.213	0.699	2.104	0.916	0.542	1.548	0.851	0.534	1.356
		Employed part time	1.560	0.930	2.615	1.628	0.888	2.985	0.969	0.536	1.751	0.4311	0.244	0.761
		Employed full time (Ref)												
Yemen	Receiving remittances	No	1.553	0.813	2.965	1.608	0.951	2.719	0.767	0.495	1.190	0.650	0.401	1.052
		Yes (Ref)												
	Area of residence	Rural	0.956	0.565	1.617	1.082	0.693	1.689	0.792	0.524	1.199	1.315	0.800	2.163
		Urban (Ref)												
	Education	Completed elementary	1.595	0.491	5.180	1.403	0.614	3.208	0.936	0.448	1.959	0.560	0.250	1.253
		Secondary-3-year Tertiary	1.801	0.545	5.958	1.044	0.445	2.448	0.592	0.276	1.272	1.207	0.536	2.720
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	1.112	0.569	2.173	3.512	1.984	6.215	0.729	0.425	1.250	0.352	0.199	0.624
		Second 20%	1.268	0.661	2.432	3.415	1.948	5.988	0.841	0.499	1.417	0.274	0.153	0.491
		Middle 20%	1.253	0.655	2.396	1.510	0.837	2.723	1.468	0.891	2.419	0.417	0.244	0.711
		Fourth 20%	1.039	0.537	2.013	1.408	0.780	2.542	1.430	0.871	2.346	0.539	0.325	0.894
		Richest 20% (Ref)												
	Employment status	Unemployed	0.856	0.403	1.818	1.557	0.874	2.773	1.117	0.615	2.026	0.507	0.249	1.036
		Out of workforce	1.182	0.695	2.008	0.821	0.528	1.275	1.071	0.697	1.645	1.000	0.629	1.590
		Employed part time	0.458	0.180	1.166	0.562	0.291	1.086	1.985	1.116	3.531	1.147	0.605	2.177
		Employed full time (Ref)												
Egypt	Receiving remittances	No	1.087	0.274	4.313	0.810	0.330	1.988	0.793	0.318	1.977	1.307	0.525	3.254
		Yes (Ref)												
	Area of residence	Rural	0.890	0.594	1.331	0.788	0.585	1.031	0.740	0.540	1.014	1.801	1.316	2.465
		Urban (Ref)												
	Education	Completed elementary	5.764	2.160	15.38	1.775	0.997	3.161	0.992	0.579	1.697	0.237	0.141	0.398
		Secondary-3-year Tertiary	1.627	0.603	4.389	1.807	1.040	3.140	0.929	0.562	1.536	0.624	0.395	.9986
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	4.626	2.020	10.59	2.646	1.588	4.410	1.056	0.643	1.734	0.192	0.114	0.326
		Second 20%	4.701	2.068	10.68	2.509	1.526	4.128	0.816	0.501	1.329	0.294	0.183	0.472
		Middle 20%	3.157	1.355	7.357	2.695	1.644	4.418	0.780	0.479	1.269	0.386	0.245	0.608
		Fourth 20%	2.896	1.223	6.855	1.570	0.941	2.619	0.835	0.518	1.346	0.645	0.418	0.994
		Richest 20% (Ref)												
	Employment status	Unemployed	2.431	0.945	6.257	2.224	1.080	4.580	0.408	0.148	1.123	0.492	0.200	1.208
		Out of workforce	1.321	0.824	2.116	1.159	0.833	1.612	0.862	0.614	1.209	0.948	0.683	1.317
		Employed part time	2.959	1.388	6.311	1.415	0.754	2.656	0.595	0.278	1.276	0.487	0.228	1.041
		Employed full time (Ref)												
Haiti	Receiving remittances	No	2.304	1.238	4.290	0.338	0.160	0.715	1.419	0.484	4.164	0.616	0.248	1.530
		Yes (Ref)												
	Area of residence	Rural	1.746	1.035	2.947	1.093	0.563	2.121	0.377	0.162	0.878	0.481	0.201	1.149
		Urban (Ref)												
	Education	Completed elementary	0.661	0.058	7.467	NA	NA	NA	1.202	0.044	32.63	0.388	0.019	8.024
		Secondary-3-year Tertiary	0.480	0.044	5.292	NA	NA	NA	1.116	0.043	28.91	0.699	0.037	13.22
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	1.582	0.687	3.645	1.440	0.530	3.915	1.164	0.275	5.176	0.087	0.014	0.542
		Second 20%	1.704	0.724	4.009	0.481	0.153	1.512	2.022	0.499	8.188	0.499	0.146	1.700
		Middle 20%	2.037	0.863	4.810	0.465	0.153	1.408	0.900	0.182	4.454	0.716	0.231	2.220
		Fourth 20%	1.612	0.706	3.683	0.669	0.236	1.899	2.480	0.637	9.660	0.287	0.080	1.029
		Richest 20% (Ref)												
	Employment status	Unemployed	0.641	0.184	2.233	2.380	0.370	15.30	1.096	0.124	9.709	0.834	0.123	5.670
		Out of workforce	0.382	0.126	1.154	3.343	0.604	18.50	1.446	0.209	9.986	1.598	0.352	7.245
		Employed part time	0.418	0.135	1.298	3.563	0.627	20.30	2.451	0.356	16.85	0.611	0.118	3.160
		Employed full time (Ref)												
Argentina	Receiving remittances	No	0.657	0.090	4.778	1.357	0.107	17.19	0.332	0.063	1.741	3.556	0.437	28.94
		Yes (Ref)												
	Area of residence	Rural	0.421	0.589	1.248	0.685	0.461	1.016	1.512	1.085	2.107	1.005	0.757	1.336
		Urban (Ref)												
	Education	Completed elementary	6.635	1.013	43.46	1.708	0.580	5.029	0.999	0.451	2.213	0.416	0.210	0.825
		Secondary-3-year Tertiary	3.023	0.462	19.78	1.504	0.522	4.335	1.377	0.644	2.945	0.559	0.307	1.154
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	11.98	4.78	29.99	5.002	2.368	10.56	1.101	0.618	1.965	0.137	0.084	0.224
		Second 20%	10.18	4.057	25.55	3.321	1.565	7.045	1.307	0.752	2.273	0.201	0.126	0.321
		Middle 20%	4.786	1.748	12.39	1.944	0.882	4.282	1.534	0.898	2.620	0.314	0.200	0.493
		Fourth 20%	2.792	1.027	7.589	1.944	0.882	4.282	1.544	0.909	2.622	0.472	0.301	0.741
		Richest 20% (Ref)												
	Employment status	Unemployed	2.277	1.213	4.275	0.768	0.391	1.509	1.264	0.694	2.304	0.538	0.303	0.955
		Out of workforce	1.625	1.007	2.622	0.559	0.342	0.912	0.865	0.575	1.300	1.222	0.867	1.721
		Employed part time	1.823	1.074	3.095	0.918	0.555	1.518	0.801	0.503	1.277	0.904	0.612	1.335

		Employed full time (Ref)												
Nepal	Receiving remittances	No	1.027	0.511	2.063	2.228	1.374	3.612	0.732	0.512	1.046	0.794	0.557	1.132
		Yes (Ref)												
	Area of residence	Rural	0.735	0.337	1.603	1.295	0.783	2.141	2.813	1.744	4.537	0.419	0.284	0.617
		Urban (Ref)												
	Education	Completed elementary	NA	NA	NA	1.347	0.392	4.626	1.110	0.374	3.297	0.562	0.214	1.471
		Secondary-3-year Tertiary	NA	NA	NA	0.666	0.181	2.447	0.881	0.285	2.272	1.332	0.490	3.623
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	4.122	1.468	11.57	2.350	1.314	4.203	1.296	0.765	2.196	0.258	0.154	0.432
		Second 20%	2.359	0.821	6.780	1.870	1.045	3.346	1.244	0.734	2.108	0.464	0.289	0.745
		Middle 20%	1.443	0.480	1.336	1.438	0.800	2.587	2.091	1.275	3.430	0.412	0.260	0.651
		Fourth 20%	1.491	0.498	4.463	0.917	0.492	1.709	2.101	1.269	3.478	0.553	0.351	0.871
		Richest 20% (Ref)												
	Employment status	Unemployed	1.140	0.316	4.107	0.828	0.334	2.049	2.098	1.020	4.313	0.552	0.255	1.192
		Out of workforce	0.701	0.354	1.387	0.965	0.644	1.445	0.844	0.584	1.219	1.310	0.930	1.844
		Employed part time	0.682	0.317	1.469	1.190	0.761	1.862	1.433	0.953	2.154	0.642	0.412	0.999
		Employed full time (Ref)												
India	Receiving remittances	No	NA	NA	NA	0.713	0.170	2.985	1.437	0.327	6.622	0.581	0.179	1.888
		Yes (Ref)												
	Area of residence	Rural	1.182	0.771	1.813	3.011	1.822	4.997	1.462	1.068	2.002	0.485	0.373	0.631
		Urban (Ref)												
	Education	Completed elementary	4.697	1.438	15.33	1.916	0.761	4.521	1.367	0.709	2.636	0.324	0.185	0.569
		Secondary-3-year Tertiary	1.646	0.498	5.444	1.108	0.436	2.813	1.390	0.726	2.663	0.676	0.386	1.183
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	5.206	2.875	9.426	4.467	2.428	8.217	1.686	1.092	2.603	0.150	0.104	0.217
		Second 20%	2.414	1.306	4.462	3.556	1.924	6.572	1.181	1.431	3.234	0.268	0.189	0.382
		Middle 20%	1.793	0.957	3.361	1.988	1.043	3.787	2.190	1.445	3.317	0.412	0.291	0.584
		Fourth 20%	1.153	0.576	2.311	2.793	1.475	5.291	1.649	1.066	2.552	0.496	0.346	0.712
		Richest 20% (Ref)												
	Employment status	Unemployed	1.376	0.608	3.116	0.857	0.380	1.932	1.427	0.789	2.581	0.727	0.421	1.256
		Out of workforce	0.775	0.570	1.054	0.627	0.466	0.844	1.086	0.846	1.393	1.405	1.128	1.749
		Employed part time	0.920	0.581	1.457	0.985	0.641	1.513	1.395	0.942	2.067	0.772	0.529	1.128
		Employed full time (Ref)												
Kyrgyzstan	Receiving remittances	No	1.344	0.502	3.603	0.760	0.420	1.374	0.954	0.611	1.487	1.097	0.721	1.667
		Yes (Ref)												
	Area of residence	Rural	2.706	0.760	9.637	1.125	0.579	2.186	1.271	0.828	1.950	0.687	0.464	1.017
		Urban (Ref)												
	Education	Completed elementary	3.914	0.467	32.83	1.095	0.458	2.618	0.741	0.418	1.311	1.090	0.637	1.866
		Secondary-3-year Tertiary	5.935	0.796	44.26	1.190	0.569	2.487	0.906	0.569	1.443	0.815	0.523	1.270
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	2.681	1.012	7.106	3.587	1.789	7.191	1.632	0.989	2.692	0.266	0.166	0.424
		Second 20%	1.088	0.370	3.198	1.601	0.749	3.422	1.505	0.905	2.504	0.594	0.374	0.942
		Middle 20%	0.920	0.301	2.807	1.130	0.515	2.482	1.384	0.838	2.286	0.754	0.479	1.188
		Fourth 20%	0.909	0.273	3.027	0.877	0.390	1.978	1.505	0.927	2.444	0.749	0.481	1.169
		Richest 20% (Ref)												
	Employment status	Unemployed	4.890	1.972	12.12	1.547	0.693	3.457	0.770	0.379	1.564	0.473	0.241	0.929
		Out of workforce	0.622	0.295	1.311	0.492	0.296	0.817	0.735	0.520	1.038	1.912	1.383	2.643
		Employed part time	0.689	0.270	1.759	0.826	0.456	1.505	1.142	0.737	1.769	1.028	0.671	1.575
		Employed full time (Ref)												
Kazakhstan	Receiving remittances	No	0.219	0.031	1.564	NA	NA	NA	1.132	0.389	3.293	0.875	0.325	2.355
		Yes (Ref)												
	Area of residence	Rural	0.649	0.239	1.759	0.751	0.379	1.487	0.437	0.297	0.642	2.367	1.640	3.417
		Urban (Ref)												
	Education	Completed elementary	4.960	0.423	58.16	0.110	0.014	0.898	1.924	0.958	3.864	0.693	0.364	1.321
		Secondary-3-year Tertiary	4.807	0.506	45.67	1.159	0.494	2.720	2.298	1.330	3.971	0.421	0.257	0.688
		Four years of over high school (Ref)												
	Income per capita	Poorest 20%	19.41	1.732	217.6	11.80	1.859	75.54	2.940	1.526	5.662	0.165	0.089	0.307
		Second 20%	2.388	0.149	38.24	11.50	1.816	72.84	2.957	1.559	5.607	0.232	0.126	0.428
		Middle 20%	1.256	0.058	27.24	10.05	1.603	63.07	2.745	1.447	5.207	0.260	0.141	0.480
		Fourth 20%	3.930	0.304	50.87	3.208	0.440	23.37	1.438	0.740	2.793	0.566	0.303	1.060
		Richest 20% (Ref)												
	Employment status	Unemployed	0.968	0.210	4.475	2.632	1.108	6.253	1.636	0.860	3.113	0.392	0.204	0.753
		Out of workforce	0.355	0.105	1.201	0.533	0.236	1.202	0.582	0.381	0.888	2.024	1.379	3.023
		Employed part time	1.570	0.429	5.746	0.600	0.164	2.189	0.637	0.312	1.298	1.460	0.785	2.715
		Employed full time (Ref)												

Reference: Data analysis of the Gallup survey, 2017

Table 14. Selected ten countries in the Global South

Regions	Countries	Severe FIS (%)[1]	Remittances received (% of GDP)[2]	Total country's GDP (current US$ million)3	Remittances received (US$) (thousand)[4]
Commonwealth of Independent States	Kazakhstan	0.7	0.2	162,886.87	355,001.27
	Kyrgyzstan	5.9	32.9	7,564.74	2,485,778.06
Asia (Southeast, South, and East)	India	12.4	2.65	2,600,818.24	68,967,175.50
	Nepal	8.3	27.85	24,880.27	6,928,134.01
Latin America and the Caribbean	Argentina	4.7	0.09	637,430.33	570,319.41
	Haiti	70.8	32.4	8,408.15	2,721,841.07
Middle East and North Africa	Egypt	12.1	10.06	235,369.13	23,680,000.00
	Yemen	7.9	10.72	637,430.33	3,350,500.10
Sub-Saharan Africa	Liberia	63.9	12.3	3,285.45	403,475.87
	South Africa	21.0	0.25	348,871.65	873,212.123

References: FAO (2016); World Bank (2019b); World Bank (2019a); World Bank (2019c).

[1] FAO. (2016). Voices of the Hungry. Methods for estimating comparable prevalence rates of food insecurity experienced by adults throughout the world.

[2] World Bank. (2019b). Personal remittances received (% of GDP). Retrieved from: https://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS

[3] World Bank. (2019a). GDP (current US$). Retrieved from: https://data.worldbank.org/indicator/NY.GDP.MKTP.CD

[4] World Bank. (2019c). Personal remittances received (current US$). Retrieved from: https://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT

Appendix 2

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REMITTANCES REVIEW

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The Impact of Remittances on Food Security Status in the Global South

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Abstract

International remittances to developing countries attract increasing attention because of their rise in volume and their impact on the recipient countries. Receiving remittances from outside the country has become a household coping strategy that might reduce poverty, alleviate hunger, promote better diets and increase productive investments. The main purpose of this study is to investigate the link between receiving remittances and the food security status in the Global South countries. This is the first study that examines the association between food security and receiving remittances by using the Food Insecurity Experience Scale (FIES) for individuals in the Global South. Data were obtained from the 2017 Gallup World Poll (GWP), which interviewed face-to-face 68,463 individuals in more than 60 countries. We have found a significant association between receiving remittances and food security. In the unadjusted logistics regression, irrespective of geography, severe food insecurity was significantly related to not receiving remittances (OR=1.532; P= 0.000). Although receiving remittances seems to positively affect the food security status of individuals in the GS, the association might not apply to all countries in the analyzed sample.

Keywords: Remittances; food security; poverty; Global South.

JEL Classification: F22, F24

Introduction

Poverty, food insecurity, lack of employment opportunities, limited access to social protection, and lack of access to natural resources are the main factors which compel people to leave their homes (FAO, 2017). These are labeled as "human insecurity" reflecting various

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conflicts, conflicts of interest, tensions causing discomfort and potentially leading to out-migration (Sirkeci, 2009; Sirkeci and Cohen, 2016). Despite opposing views, remittances are often considered as one of the major benefits of migration to sending countries (Anghel, Piracha, & Randazzo, 2015). Similar to migration, flows of remittances have also increased to developing countries in recent decades despite the adverse effects of the global financial crisis (Sirkeci, 2017:61; Ratha et al., 2016; Sirkeci et al., 2012). Apart from macro level impacts, receiving remittances, as one of the coping strategies, supports families especially in the times of (financial or other) crises (Sirkeci et al., 2012) and contribute to poverty reduction and food insecurity (Dhungana & Pandit, 2016).

Earlier studies have shown that receiving remittances has an impact on household expenditure and (food) consumption (see Adams and Cuecuecha, 2010a; Zarate-Hoyos, 2004). They may lead to increases in overall expenditures or changes in the basket of food and non-food items consumed (Perakis, 2011). For instance, Quisumbing and McNiven (2010) in a study argue that remittances have a positive impact on housing, consumer durables, non-land assets, and total expenditures. Notably, another study shows that households with remittances have high food consumption compared to non-receivers (Adams & Cuecuecha, 2010b). However, little is known about the remittances and food security relationship. Hence, the main purpose of this study is to investigate the potential relationship between receiving remittances and the food security status in Global South (GS) regions. Although there are some studies on different countries that explore the association between receiving remittances and household food quality and quantity consumption or food consumption expenditures, this is the first study that examines the association between food security and receiving remittances by using the Food Insecurity Experience Scale (FIES) for individuals in the Global South (GS).

Methodology

Data were obtained from the 2017 Gallup World Poll (GWP), which interviewed face-to-face 68,463 individuals in more than 60 countries (Table 1). The target population in the GWP is the entire civilian, non-institutionalized, population aged 15 and older. All samples were selected using probability sampling techniques and are nationally representative. The GWP annual surveys cover on average 1,000 individuals per country per year. In this study, the GWP data were analysed using various statistical techniques and presented in descriptive tables, cross-tabulations as well as binary, and multinomial logistic regressions. We have particularly examined the potential

association between receiving remittances and the food security status, by controlling the role of covariates. Additionally, the predictors of receiving remittances were also measured.

Table 1. Sample of the Global South by countries in the GWP (n=68,463)

Regions	Countries	Sample
Commonwealth of Independent States	Kazakhstan	1000
	Kyrgyzstan	1000
	Tajikistan	1000
	Uzbekistan	1000
Asia (Southeast, South, and East)	Afghanistan	1000
	Bangladesh	1000
	Cambodia	1600
	India	3000
	Mongolia	1000
	Myanmar	1600
	Nepal	1000
	Pakistan	1600
	Philippines	1000
	Sri Lanka	1104
	Vietnam	1002
Latin America and the Caribbean	Argentina	1000
	Bolivia	1000
	Brazil	1000
	Chile	1040
	Colombia	1000
	Costa Rica	1000
	Dominican Republic	1000
	Ecuador	1000
	El Salvador	1000
	Guatemala	1000
	Haiti	504
	Honduras	1000
	Mexico	1000
	Nicaragua	1000
	Panama	1000
	Peru	1000
	Uruguay	1000
Middle East and North Africa	Egypt	1000
	Jordan	1012
	Lebanon	1000
	Palestinians Territories	1000
	Tunisia	1001
	Yemen	1000
Sub-Saharan Africa	Benin	1000
	Botswana	1000
	Burkina Faso	1000
	Cameroon	1000

Table 1. Continued.

Region:	Sub-Saharan Africa	Benin	1000
		Botswana	1000
		Burkina Faso	1000
		Cameroon	1000
		Chad	1000
		Congo Kinshasa and Brazzaville	2000
		Ethiopia	1000
		Gabon	1000
		Ghana	1000
		Guinea	1000
		Ivory coast	1000
		Kenya	1000
		Liberia	1000
		Malawi	1000
		Mali	1000
		Mauritania	1000
		Nigeria	1000
		Senegal	1000
		Sierra Leon	1000
		South Africa	1000
		South Sudan	1000
		Tanzania	1000
		Togo	1000
		Zambia	1000
		Zimbabwe	1000

Source: GWP, 2017

Outcome variable (Food Insecurity Experience Scale (FIES)

The outcome variable is the Food Insecurity Experience Scale (FIES) score, which is used to measure individuals' questions food security status. As an individual-based index, this tool contains eight items with "yes" or "no" answers, focusing on the access dimension of food security. Responses to the eight are combined, and each individual is assigned a food security score from zero to eight. The FIES was recoded as 0 for "food secure" (FS), 1-3 for "mildly food insecure" 4-6 for "moderately food insecure", and 7-8 for "severely food insecure". To run the logistic regression, every single value of the FIES (FS, Mild, Moderate, and Severe FIS) was recoded as a dummy variable.

Exposure variables

Receiving remittances is the principal independent variable in this study. The following question is used to measure remittances: "In the past 12 months, did this household receive help in the form of money or goods from another individual living inside this country, living in another country, both, or neither?" The answers to the original question were recoded as either "receiving remittances from outside" or "no remittances."

Statistical analyses

Data were analysed using SPSS (Version 24). We have used descriptive statistics to present the frequencies of food security statuses, receiving remittances, and of controlling variables. Crosstabulations were also carried out to explore the association between dependent and independent variables. Two binary logistic regression analyses were also carried out. The first one was performed to assess the association between the food security status and receiving remittances by controlling each of the covariates. The second was carried out to measure the association between receiving remittances and the covariates.

It should be noted that the FIES (as outcome variable) was separated into four different levels with yes and no answers. The level of significance was reported at the P-value equal to or less than 0.05. In the crosstab analyses, apart from the level of significance, the strength of associations between dependent and independent variables was estimated through Cramer's V and Gamma to show the direction of the association between the variables included in the models.

Results

Table 2 summarises the characteristics of the sample used in this study. The Global South (GS) (n=68,463) is made up of five regions included in this study: Sub-Saharan Africa (SSA) (n=27,000); Middle East and North Africa (MENA) (n=6,013); Latin America and the Caribbean (LAC) (n=16544); Asia (Southeast, South, and East) (n=14,906); and the Commonwealth of Independent States (CIS) (n=4000).

Regardless of region, 32% of individuals were food secure, while about 28% of individuals were severely food insecure in the Global South. 6% of households were reported to have received remittances from outside the country. Females represented just over half of the sample in this study. In terms of age, 44% of the sample were between 26 and 49 years old. Low level of education was significantly marked in the GS as 51% of the population were categorized as low educated, regardless of sex. The data has also revealed that a little more than a third of the sample were employed full time (36%) and around 50% reported feeling "difficulty" about their household income.

Table 3 illustrates the Food Insecurity Experience Scale (FIES) by regions in the Global South (GS) in 2017: About 14% of SSA and 58% of the Commonwealth of Independent States (CIS) reported being food secure. However, more than 40% of samples in MENA, LAC, and Asia reported being food secure in 2017.

Table 2. Characteristics of sample (n=68,463)

		N (%)
Regions	Commonwealth of Independent States	4,000 (5.8)
	Asia (Southeast, South, and East)	14,906 (21.8)
	Latin America and the Caribbean	16,544 (24.2)
	Middle East and North Africa	6,013 (8.8)
	Sub-Saharan Africa	27,000 (39.4)
Food security status	Severely food insecure	18,360 (28.3)
	Moderate food insecurity	12,479 (19.2)
	Mild food insecurity	13,065 (20.1)
	Food secure	20,965 (32.3)
Receiving remittances	Yes	3,373 (6.1)
Area of residence	Rural	44,266 (64.7)
	Urban	24,1925 (35.3)
Household size	7 and more	19,488 (28.5)
	4-6	30,230 (44.2)
	1-3	18,745 (27.4)
Sex	Female	35,199 (51.4)
	Male	33,264 (48.6)
Age	13-25	23,052 (33.7)
	26-49	30,472 (44.5)
	50-64	9,794 (14.3)
	65-99	5,145 (7.5)
Marital status	Single/never married	24,621 (36.1)
	Divorced/separated/widowed	6,437 (9.4)
	Married/living with partner	37,161(54.5)
Education	Completed elementary	34,597 (51.0)
	Secondary-3-year Tertiary	28,963 (42.7)
	Four years of over high school	4,344 (6.4)
Employment	Unemployed	5,372 (7.8)
	Out of workforce	24,955 (36.5)
	Employed part-time	13,383 (19.5)
	Employed full-time	24,752 (36.2)
Feelings about HH income	Very difficult	13,890 (20.7)
	Difficult	20,216 (30.1)
	Getting by	23,474 (35.0)
	Living comfortably	9,501 (14.2)
Not enough money for shelter	No	40,340 (60.6)

Source: Data analysis of the Gallup survey, 2017

Table 3. Prevalence of Food Insecurity Experience Scale in regions of the Global South (n=68,463)

	SSA	MENA	LAC	Asia	CIS
Severe FIS	47.9	12.4	21.6	12.2	5.7
Moderate FIS	22.6	17.8	16.6	18.4	11.6
Mild FIS	15.7	18.7	20.6	27.2	24.4
Food secure	13.8	51.0	41.1	42.2	58.2

Source: Data analysis of the Gallup survey, 2017

Gamma and Cramer's V coefficients are presented in Tables 4 and 5. The first table focuses on the determinants of the FIES and the second concerned the determinants of receiving remittances.

Table 4 shows the association between the FIES and explanatory variables. A significant association was observed between receiving remittances and the food security status. However, this association was very weak (0.043; P=0.000). All socio-demographic characteristics were also found to be significantly related to food security. Specifically, a significant association was observed between sex and the food security status (0.028; P=0.000). Males were more food secure than females in the GS countries, regardless of region. Association between education and food security was almost substantial (0.353; P=0.000). Unsurprisingly, income per capita was also found to be significantly associated with the food security (0.243; P=0.000). A significant association was observed between family size and household composition and the food security status (0.168; P=0.000). The results indicated that urban people were more food secure than their rural counterparts (0.141; P=0.000). This could be also a reflection of overall urban-rural inequalities in many countries (e.g. Sahn and Stifel, 2003; Thu and Booth, 2014). Food security was related significantly to "feelings about household income" where correlation was strong (0.577; P=0.000). Individuals living with food security felt comfortable about their household income, and people who were not able to afford expenditure for shelter reported being food insecure (0.330; P=0.000).

Table 4. Bivariate analyses between the food security status1 and independent factors (n=68,463)

		Strength of association	Level of significance
Receiving remittances	Cramer's V	0.043	0.000
Sex	Cramer's V	0.028	0.000
Area of residence	Cramer's V	0.141	0.000
Age groups	Gamma	-0.012	0.016
Marital status	Gamma	-0.041	0.000
Household size	Gamma	0.168	0.000
Education	Gamma	0.353	0.000
Employment	Gamma	0.035	0.000
Per capita income quintile	Gamma	0.243	0.000
Feelings about household income	Gamma	0.577	0.000
Not enough money for shelter	Cramer's V	0.330	0.000

Source: Gallup World Poll, 2017

1. FIES (0= Severely Food Insecure (FIS); 1= Moderately FIS; 2= Mildly FIS; 3=Food secure)

Table 5 shows the association between receiving remittances and explanatory variables. All explanatory variables were significantly

associated with receiving remittances, except insufficient money for shelter. However, for most variables, the strength of associations was very weak according to Cramer's V test. Only inadequate finances (i.e. not enough money for the shelter) shown a higher value but this relationship was not statistically significant (P=0.370).

Table 5. Bivariate analyses between receiving remittances and independent factors (n=68,463)

			Strength of association	Level of significance
Socio-demographic factors	Area of residence	Cramer's V	0.036	0.000
	Household size	Cramer's V	0.011	0.036
	Education	Cramer's V	0.036	0.000
	Employment	Cramer's V	0.036	0.000
	Per capita income quintile	Cramer's V	0.070	0.000
	Feelings about household income	Cramer's V	0.055	0.000
	Not enough money for the shelter	Cramer's V	0.204	0.370

Source: Data analysis of the Gallup survey, 2017

Tables 6 and 7 illustrate the unadjusted binary logistic regression between food security and receiving remittances by controlling the role of covariates: Severe food insecurity was significantly more likely among those who were not receiving remittances (OR=1.532; P=0.000). Sub-Saharan Africa (OR=15.28; P=0.000) was categorized as the region with the most severe food insecurity compared to the other regions. Results from socio-demographic factors of all regions indicated that the probability of being severely food insecure increased among females (OR=1.061; P=0.000), living in rural areas (OR=1.645; P=0.000), in large households (OR=1.750; P=0.000), between 26 and 49 years of age (OR=1.171; P=0.000), in the poorest 20% of income quintile (OR=2.994; P=0.000), with low education (OR= 6.568; P=0.000), being unemployed (OR=1.948; P=0.000), and divorced/separated and widowed (OR=1.370; P=0.000).

Table 6. Unadjusted binary logistic regression analyses between food security, and receiving remittances and covariates (n=68,463)

		Severely FIS			Moderately FIS		
			95% CI			95% CI	
		Odds ratio	Low	High	Odds ratio	Low	High
Receiving remittances	No	1.532	1.404	1.672	0.897	0.821	0.980
	Yes (Ref)						
Regions	Sub-Saharan Africa	15.28	13.26	17.60	2.218	1.997	2.463
	Middle East and North Africa	2.352	2.005	2.760	1.643	1.456	1.854
	Latin America and the Caribbean	4.577	3.960	5.291	1.514	1.357	1.689
	Asia (Southeast, South, and East)	2.309	1.990	2.678	1.705	1.529	1.902
	Commonwealth of Independent States (Ref)						
Area of residence	Rural	1.645	1.584	1.707	1.204	1.155	1.256
	Urban (Ref)						
Household size	7 and more	1.750	1.672	1.832	1.316	1.249	1.386
	4-6	1.059	1.014	1.106	1.086	1.034	1.140
	1-3 (Ref)						
Sex	Female	1.061	1.025	1.098	1.091	1.049	1.134
	Male (Ref)						
Age	13-25	1.006	0.938	1.079	1.035	0.955	1.122
	26-49	1.171	1.094	1.254	1.093	1.011	1.182
	50-64	1.036	0.958	1.121	1.044	0.961	1.141
	65-99 (Ref)						
Marital status	Single/never married	0.935	0.901	0.971	0.907	0.870	0.947
	Divorced/separated/widowed	1.370	1.294	1.452	0.944	0.881	1.012
	Married/living with partner (Ref)						
Education	Completed elementary	6.568	5.854	7.369	2.296	2.075	2.541
	Secondary-3-year Tertiary	3.297	2.935	3.705	1.743	1.572	1.931
	Four years of over high school (Ref)						
Employment	Unemployed	1.948	1.829	2.075	1.280	1.189	1.377
	Out of workforce	0.930	0.892	0.970	0.975	0.930	1.022
	Employed part-time	1.524	1.454	1.596	1.221	1.158	1.288
	Employed full-time (Ref)						
Per capita income quintile	Poorest 20%	2.994	2.828	3.169	1.788	1.677	1.906
	Second 20%	2.199	2.075	2.330	1.626	1.524	1.735
	Middle 20%	1.778	1.676	1.886	1.470	1.377	1.570
	Fourth 20%	1.381	1.300	1.476	1.337	1.251	1.429
	Richest 20% (Ref)						

Source: Data analysis of the Gallup survey, 2017

Food security was significantly associated with receiving remittances: Non-remittance receivers were less likely to be food secure (OR= 0.898; P=0.000). Similarly, food security was low in Sub-Saharan Africa (OR= 0.115; P=0.000) compared to the other regions. Within all regions, the probability of being food secure decreased among people living in rural areas (OR=0.567; P=0.000). Findings also showed that people living in large households (7 and more) were less likely to be food secure (OR=0.484; P=0.000). Females (OR= 0.898; P=0.000) were less

food secure compared to their male counterparts. Our results also shows that divorced/separated and widowed people were less food secure (OR=0.882; P=0.000). Education level was significantly associated with the food security status (OR=0.189; P=0.000). Surprisingly, people who were out of the workforce reported being food secure (OR=1.138; P=0.000). A significant positive association was observed between income quintile and the food security status (OR=0.257; P=0.000).

Table 7. Unadjusted binary logistic regression analyses between food security, and receiving remittances and covariates (n=68,463)

		Mildly FIS			Food secure		
			95% CI			95% CI	
		Odds ratio	Low	High	Odds ratio	Low	High
Receiving remittances	No	0.803	0.739	0.874	0.898	0.833	0.967
	Yes (Ref)						
Regions	Sub-Saharan Africa	0.574	0.528	0.623	0.115	0.106	0.123
	Middle East and North Africa	0.712	0.644	0.787	0.748	0.689	0.813
	Latin America and the Caribbean	0.804	0.739	0.875	0.501	0.465	0.539
	Asia (Southeast, South, and East)	1.155	1.063	1.256	0.524	0.487	0.564
	Commonwealth of Independent States (Ref)						
Area of residence	Rural	1.006	0.967	1.048	0.567	0.549	0.587
	Urban (Ref)						
Household size	7 and more	0.948	0.899	0.998	0.484	0.462	0.506
	4-6	1.069	1.021	1.121	0.864	0.831	0.898
	1-3 (Ref)						
Sex	Female	0.987	0.950	1.026	0.898	0.869	0.928
	Male (Ref)						
Age	13-25	1.066	0.985	1.153	0.930	0.871	0.992
	26-49	1.054	0.976	1.138	0.783	0.734	0.834
	50-64	1.076	0.986	1.175	0.894	0.831	0.962
	65-99 (Ref)						
Marital status	Single/never married	0.888	0.852	0.925	1.239	1.197	1.283
	Divorced/separated/widowed	0.812	0.757	0.871	0.882	0.830	0.937
	Married/living with partner (Ref)						
Education	Completed elementary	0.943	0.870	1.021	0.189	0.176	0.202
	Secondary-3-year Tertiary	0.987	0.911	1.070	0.435	0.406	0.465
	Four years of over high school (Ref)						
Employment	Unemployed	0.782	0.723	0.846	0.466	0.433	0.502
	Out of workforce	0.928	0.887	0.970	1.138	1.096	1.181
	Employed part-time	0.916	0.868	0.967	0.595	0.567	0.625
	Employed full-time (Ref)						
Per capita income quintile	Poorest 20%	0.905	0.850	0.962	0.257	0.243	0.272
	Second 20%	1.017	0.957	1.081	0.383	0.364	0.403
	Middle 20%	1.079	1.016	1.146	0.493	0.469	0.519
	Fourth 20%	1.091	1.027	1.159	0.647	0.615	0.679
	Richest 20% (Ref)						

Source: Data analysis of the Gallup survey, 2017

Table 8 shows the multinomial logistic regression results regarding the four levels of the FIES and receiving remittances: Apart from the four-level analyses of the FIES in the binary form, the four levels of the FIES all together were calculated with receiving remittances. Results of a multinomial regression analysis demonstrated that not receiving remittances increased the probability of severe food insecurity.

Table 8. Multinomial logistic regression analysis between the FIES (four levels) and receiving remittances (n=68,463)

				95% CI	
			Odds ratio	Low	High
Severely food insecure	Receiving remittances	No	1.421	1.288	1.567
		Yes (Ref)			
Moderately food insecure	Receiving remittances	No	0.944	0.855	1.042
		Yes (Ref)			
Mildly food insecure	Receiving remittances	No	0.868	0.790	0.955
		Yes (Ref)			
Food secure (Ref)	Receiving remittances	No	1.421	1.288	1.567
		Yes (Ref)			

Source: Data analysis of the Gallup survey, 2017

Table 9. Adjusted binary logistic regression analysis of receiving remittances and explanatory factors (n=68,463)

			95% CI	
		Odds ratio	Low	High
Area of residence	Rural	0.940	0.862	1.026
	Urban (Ref)			
Per capita income quintile	Poorest 20%	0.494	0.426	0.572
	Second 20%	0.643	0.565	0.731
	Middle 20%	0.692	0.612	0.781
	Fourth 20%	0.787	0.703	0.882
	Richest 20%			
Education	Completed elementary	1.219	1.035	1.436
	Secondary-3-year Tertiary	1.095	0.944	1.269
	Four years of over high school (Ref)			
Employment	Unemployed	1.536	1.322	1.786
	Out of workforce	1.275	1.155	1.407
	Employed part-time	1.498	1.343	1.671
	Employed full-time (Ref)			
Regions	Sub-Saharan Africa	0.757	0.630	0.911
	Middle East and North Africa	0.537	0.414	0.695
	Latin America and the Caribbean	0.628	0.522	0.756
	Asia (southeast, south, and East)	0.735	0.610	0.887
	Com. Wealth of Independent States (Ref)			

Source: Data analysis of Gallup survey, 2017

In Table 9 we present adjusted models for the determinants of remittances: Apart from the factors associated with the food security level of the FIES, adjusted models, regardless of region, was calculated for the determinants of receiving remittances. Findings from the adjusted model indicated that the probability of receiving remittances decreased among households that belonged to the poorest 20% income quintile (OR=0.494; P=0.000). This is perhaps not surprising as migration is less likely among the poorest segments of populations compared to lower middle and middle income groups (Sirkeci, Cohen, Yazgan, 2012; Gonzalez-Konig and Wodon, 2005; Du et al., 2005; Stark and Yitzhaki, 1988).

Discussion and concluding remarks

Since little is known about the remittances and food security relationship, the main purpose of this study was to investigate the possible link between receiving remittances and individuals' food security status in the Global South (GS) regions. Although there are some studies on different countries that explore the association between receiving remittances and food quality and quantity consumption or food consumption expenditure, this study is the first that considers the association between food security and receiving remittances through using the Food Insecurity Experience Scale (FIES) applied to the GS. As an individual-based index, this tool contains eight items with "yes" or "no" answers, focusing on the access dimension of food security and it was also validated by the Food and Agriculture Organization (FAO) in 2014 (Ballard et al., 2014).

Findings from descriptive analyses showed that Sub-Saharan Africa (SSA) has the highest prevalence of food insecure individuals compared to other regions. Results from this study are corroborated by previous studies reporting that 235 million people are chronically hungry in SSA. Regarding causes, many factors, such as climate change, farm productivity and access to soil amendments, labour availability and family income, influence food insecurity in SSA (Mendum & Njenga, 2018; Tumushabe, 2018). Conflicts and insecurity are among the primary drivers of food insecurity in Africa. In addition, climate disasters, specifically drought, are the major causes of food crises in Africa (Reliefweb, 2018). This is in line with the conflict model of migration (Sirkeci, 2009) which predicts higher levels of out migration in areas where perceived level of insecurity increases in response to conflicts and crises of any kind and intensity.

In Latin America and the Caribbean (LAC), although substantial progress has been made on the social and economic front (WB, 2018), large segments of the population (over 34 million people) still suffer from hunger, food insecurity, and chronic malnutrition (de

Moraes Sá et al., 2017). Results from this study confirm the findings of available studies and indicate that more than 20% of the sample from LAC reported being severely food insecure in 2017. Similar to SSA, factors such as climate change (which affects crop yields and local economies), persistent inequities in income distribution, and access to social protection are among the determinants of food insecurity in LAC (Chile, 2016; WB, 2018).

Available evidence has shown that remittances have significant positive effects on the food security status of developing countries (Szabo, Adger, & Matthews, 2018). For instance, Regmi and Paudel (2016) in their study focus on the impact of remittance income and how it contributes to alleviating food insecurity in the rural areas with severe hunger and poorer food consumption. Additionally, Perakis (2011) argues that regardless of the short-term or long-term effects, remittances improve food security status consistently. Notably, Combes and Ebeke (2011) argue that remittances decrease household consumption instability and function as a hedge against countries that face natural disasters, agricultural shocks, and banking crises. Further, receiving remittances can act effectively on households' expenditures on food. Specifically, Adams and Cuecuecha (2010) found that remittance-receiving households had an 8.5 % increase in their average budget share in consumption expenditure on food (i.e., purchased or non-purchased foods) compared to non-remittance receivers. Receiving remittances promotes quantity and quality of foods and encourages people to consume more food and macronutrients (e.g., staple crops, meat, milk, and processed foods) (Durand, Parrado, & Massey, 1996). In developing countries, such as SSA countries, inflows of remittances contribute to at least 4% of the gross domestic product (GDP). This leads to a considerable slowdown effect on high food prices in household food consumption (Combes, Ebeke, Etoundi, & Yogo, 2012; Combes, Ebeke, Etoundi, & Yogo, 2014). Therefore, declining or dropping inflows of remittances to vulnerable countries can create an economic burden on people as well as governments (Chami, Hakura, & Montiel, 2009). In this study, regardless of region, a significant association was observed between receiving remittances and the food security status of individuals (both crosstabs and regression analyses) in the GS.

The findings of this study showed that not receiving remittances was significantly associated with severe food insecurity at the global level. Results from the adjusted models show that socio-demographic factors, such as the area of residence, education, employment status, and income quintile, were significantly related to food security. As a

result, this study found that receiving remittances seems to indirectly influence the food security status of individuals in the GS regions. The findings from this study have been corroborated by other available studies. Compared to urbanites, people in rural areas comprise most of the food insecure in developing countries (Smith, Kassa, & Winters, 2017). Low level of education contributes to food insecurity status (Bruening, MacLehose, Loth, Story, & Neumark-Sztainer, 2012). Being unemployed is among the determinants of food insecurity in a population (Birkenmaier, Huang, & Kim, 2016). Household food insecurity is explained by changes in the national unemployment rate as well (Nord, Coleman-Jensen, & Gregory, 2014). Income plays a considerable role in households' food security status. Food secure households are less likely to provide an indication of any income-related problems (Tarasuk, Mitchell, & Dachner, 2016).

It should be noted that remittances are one of the most important factors contributing to the economic, social and political aspects of the lives of individuals in developing countries. The effects of remittances are seen on both the macro and micro levels. With respect to macro levels, remittances increase economic growth and gross domestic product (GDP), while reducing poverty and food insecurity in regions and countries receiving remittances. On the other hand, remittances, as a coping strategy, provide stable incomes for migrant relatives in their home countries by lessening financial constraints, smoothing consumption, encouraging investment, and supporting migrant relatives in times of economic shock and crises. Further, in line with the literature, receiving remittances seems to have a positive impact on income, human capital, social capital, agricultural production, and business/self-employment among individuals who receive them. The main purpose of this study was to investigate the linkage between receiving remittances and individuals' food security status in the Global South (GS) regions. This is a pioneering study examining such relationship in GS countries using representative samples of individuals. Remittances, as part of the coping strategies in alleviating food insecurity, operate through providing stable incomes for families and affiliates left behind in countries of origin. However, it warrants further analysis treating this relationship in the context of selectivity of migration especially at the bottom of the income scalar.

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