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The Nexus of Remittances, Institutional Quality and Financial Inclusion

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Abstract

The present paper adopted the dynamic panel data method to investigate the effect of the inflow of remittances on financial inclusion, particularly focusing on high remittance-receiving developing countries between 2011 and 2018. The current research found that remittances that foster financial inclusion are associated with better institutional quality. The evidence revealed that the effect of remittances on financial inclusion is conditional upon individuals' perception of the institutions. Positive coefficient on the interaction terms indicates that the impact of remittances on financial inclusion can be enhanced in the recipient countries, if the public trusts the financial institutions. Hence, the overall results of the current research suggest that the impact of remittances on financial inclusion is conditional on institutions. On a final note, the policy implications of these findings are thoroughly evaluated at the end of this paper.

Keywords: Remittance; Financial inclusion; Dynamic panel data method

JEL classifications: G15; G21; C23

1. Introduction

The money earned by migrants outside the country which is then sent back to their country of origin remains a significant research area among scholars and policymakers. Between 2011 and 2018, global remittances had increased from 470 to 683 billion dollars. On another note, the flow of remittances to low- and middle-income countries increased from 343 billion dollars in 2011 to 529 billion dollars in 2018, signifying a growth by 53 percent. It is crucial to acknowledge that the inflow of remittances to high-income countries only grew by 21 percent, from 127 billion dollars in 2011 to 154 billion dollars in 2018. This clearly suggests that remittances had contributed significantly to economic development of low- and middle-income countries. On a similar note, Bollard, McKenzie, Morten, and Rapoport (2011) reported that remittances do not only provide a direct improvement on the welfare of recipients but also indirectly benefit those with whom the recipients conduct transactions. Regarding this matter, it should be understood that the inflow of remittances increases the ability of recipient households to join and gain access to financial services, thereby encouraging further growth and expansion of financial inclusion. In particular, it has also been observed that remittances to developing economies for the last two decades have been 15 times of official transfers, 18 times of official capital flows, more than double private capital flows, about 30 per cent of exports (Barajas, Chami, Espinoza, & Hesse, 2010), and nearly three times more than official aid flows (World Bank, 2016).

On a more important note, several scholars have stressed the importance of remittances to financial inclusion. For example, Aggarwal, Demircuc-Kunt, and Martinez Peria (2006) argued that migrants' remittances can lead to financial sector development in less developed economies considering its ability to boost the total volume of deposits and loans granted by banking institutions to financially excluded segment. Similarly, Manuel Orozco, Lowell, and Schneider (2006) stated that the financial development of the recipient country may be promoted through remittances by stimulating the demand and access to various financial products. At the same time, the provision of remittance transfer services allows banks and financial institutions, in general, to gather information about unbanked recipients and mitigate the adverse selection problem. Apart from capturing money flows, the remittance channel can be used to sell financial service packages that are geared towards low-income individuals (Toxopeus & Lensink, 2007). However, the scatter plots for a set of 70 countries (Figures A1 and A2 in Appendix) do not support the claim that remittances can lead to the expansion of financial inclusion. As can be observed, remittances seem to have increased substantially over the years, while financial inclusion remains low. The correlation between remittances of migrant

workers and financial inclusion, either in full sample or by income group, is estimated to be negative, which suggests a contradiction with the existing theories.

The present study proposed the argument that a low expansion of financial inclusion may be the result of poor institutional quality. In particular, this can be explained by the ability of institutions to manage bureaucratic processes in the form of reducing the amount of documentation or paperwork as well as sustaining the trust of clients during remittance transactions. In addition, it should be understood that institutional quality is an important factor that influences the decision of individuals to gain access to financial services provided by particular financial institutions. Hence, the public may avoid using the institutions as a channel for remittance transactions if they have a general distrust of financial institutions as well as being wary of the long bureaucratic processes involved in remittances. As a result, they will prefer more conservative alternatives which may affect the expansion of the institutions. Therefore, against this backdrop, the present study examined the impact of remittances on the level of financial inclusion in accordance with the level of institutional quality. The main research hypothesis for this present study is as follows: an increase in remittances and institutional quality leads to more financial inclusion.

The current paper will extend the existing literature that failed to examine the impact of remittances on financial inclusion which is associated with better institutional quality, particularly bureaucratic procedures and trust as well as the response of household recipients towards financial inclusion. Moreover, the present study aims to address the shortcoming by investigating the interaction effect of remittances and institutional quality on financial inclusion. Hence, this study will try to fill in the literature gap using a dynamic panel data framework with an orthogonalized interaction term. To this end, a dynamic system Generalized Method of Moments (GMM) model was adopted for the current research and the major results of the present study revealed that remittances alone are unable to generate financial inclusion. However, it should be noted that financial inclusion can be increased with better institutional quality. Second, as suggested by Brambor, Clark, and Golder (2006), this paper calculated the marginal effects and standard errors for the interaction term. In this case, it is very important to evaluate how the marginal effect of remittances on financial inclusion changes with the degree of institutional quality in remittance recipient countries. Regarding this matter, it should be acknowledged that omitting the calculation of marginal effects may lead to misinterpretation of the interaction term.

The rest of the current paper is organized as follows: Section 2 provides a brief literature review on the demand for financial products and services, remittances, and financial inclusion. Section 3 covers

the methodology, model specifications, and data description. Finally, the conclusion is presented by summarizing the main findings of the paper along with the suggestion for further extensions of future work.

2. Literature Review

Remittances have attracted considerable scholarly attention. Meyer and Shera (2017) argued that remittances may sometimes exceed the flows of FDI. The result of their study found that remittances have a positive impact on growth. However, Cismaş, Curea-Pitorac, and Vădăsan (2020) found that the inflow of remittances does not stimulate economic growth.

Numerous studies have concentrated on the linkages between remittances and financial inclusion. Regarding this matter, it is crucial to understand that remittances can affect financial inclusion in at least two ways. First, remittances might increase the demand for savings instruments considering that the fixed costs of sending remittances may cause the flows to be lumpy, thus providing households with excess cash for a certain period of time. As a result, this might potentially increase their demand for deposit accounts based on the fact that financial institutions offer households a safe place to store their temporary excess cash (Misati, Kamau, & Nassir, 2019; Muktadir-Al-Mukit & Islam, 2016). Second, remittances might increase the chances of recipients in obtaining a loan from formal financial institutions or banks. The processing of remittance flows provides financial institutions with the necessary information on the income of the recipient households. Moreover, this information might increase the willingness of financial institutions to extend loans to otherwise opaque borrowers. Apart from that, they may be able to assess the creditworthiness of the remittance recipients (Giuliano & Ruiz-Arranz, 2009), which further suggests a positive relationship between remittances and financial inclusion. However, remittances might help to relieve the financing constraints of households, which may cause the demand for loans to fall due to the increase of remittance inflows. Meanwhile, it should be noted that steady inflows of remittances will reduce the reliance of households on loans from banks and other financial institutions in financing their basic consumption needs and other expenses. Therefore, this view hypothesizes a negative relationship between remittances and financial inclusion (Chami & Fullenkamp, 2013). Generally, the empirical literature supports the view that both the sending and receiving of remittances increase the use of financial services between the senders and recipients (Aggarwal et al., 2006; Anzoategui, Demirguc-Kunt, & Martinez Peria, 2014; Gibson, Boe-Gibson, Rohorua, & McKenzie, 2007; M Orozco & Fedewa, 2005).

Several factors have been identified to lead to financial inclusion. Wellalage and Locke (2020) and Naz, Iftikhar, and Fatima (2020) reported that education and income are positive determinants of financial inclusion, while inflation retards inclusion. Dabla-Norris, Ji, Townsend, and Unsal (2020) found that financial development and income are important drivers of opening bank account. Some scholars argued that education, economic institutions, income, political stability, quality institutions, inflation, and financial development are essential determinants of financial inclusion (see Adegbite & Machethe, 2020; Anarfo & Abor, 2020; Demirgüç-Kunt, Klapper, Singer, Ansar, & Hess, 2020; Koomson, Villano, & Hadley, 2020; Ozili, 2020).

Moreover, some scholars have also considered the linkages between institutional quality and financial development. Cull and Efron (2008) found that institutional quality fosters financial development. Meanwhile, Guiso, Sapienza, and Zingales (2008b) examined the financial markets during the crisis and concluded that formal strong institution quality and social capital which are able to foster trust by reducing the incentive to cheat are the prerequisites of a stable financial system. A considerable amount of studies have found that only individuals with sufficiently high trust are willing to participate in financial markets (see Adams-Kane & Lim, 2014, 2016; Guiso, Sapienza, & Zingales, 2008a; Guiso et al., 2008b; Shad, Ibrahim, Azman-Saini, Baharumshah, & Burhan, 2018). Law and Ibrahim (2013) asserted that trust is more significant in the development of the banking sector, but no significant relationship was noted between trust and stock market development.

Overall, it can be argued that the available published studies have failed to examine the impact of remittances on financial inclusion which is associated with better institutional quality. Therefore, the present study has found the need to address the drawbacks by conducting a thorough investigation of the effect of remittances on financial inclusion conditioning at the level of institutional quality.

3. Methodology

3.1 Data Description

The current research utilized the secondary data gathered from numerous sources, mainly the *World Development Indicators (WDI)* of the World Bank as well as the International Monetary Fund. In the case of the present study, data were collected from 70 remittances receiving developing countries over the period of 2011-2018. Some developing countries were excluded due to lack of data for financial inclusion. The list of selected counties can be observed in Table A1 provided in the Appendix.

The dependent variable in the present study (*FI*) is financial inclusion which was measured based on bank account holders per 1000 individuals, followed by the number of automated teller machine (ATM) per 100,000 adults. Regarding this matter, a number of studies (Anzoategui et al., 2014; Demirgüç-Kunt, Córdoba, Pería, & Woodruff, 2011) also utilized bank account holders per 1000 individuals as a proxy for financial inclusion. Meanwhile, a recent study by (Sarma & Pais, 2008, 2011) was found to use the automated teller machine (ATM) per 100,000 adults as a proxy for financial inclusion.

More importantly, it should be noted that most of the links between the macroeconomic variables in this area are mainly based on financial development (Beck & Demirguc-Kunt, 2009) which encompasses financial inclusion. In this case, the discussion was centered on both considering the fact that financial inclusion is a sub-set of financial development. Therefore, the independent variables for this study are the common explanatory variables for financial inclusion or financial development suggested by previous studies, including migrant workers' remittances, institutional quality, human capital, inflation rate, and income of the remittances recipient countries.

Migrant workers' remittances (MWR) are described as the ratio of personal remittances inflow to the total population. In this case, it should be understood that the remittances are capable to spur financial development by creating a demand for the opening of bank accounts and saving instruments (Anzoategui et al., 2014), including the exploration of bank services by recipients (Giuliano & Ruiz-Arranz, 2009; Orozco et al., 2005; Aggarwal et al., 2006; Gibson et al., 2006). Hence, this clearly suggests that remittances may increase the usage of bank products. On the contrary, Brown, Connell, and Jimenez-Soto (2014) revealed that remittances do not increase the likelihood of holding a bank account. In addition, a study by (Cesar Calderón, Fajnzylber, & López, 2007) indicates that remittances may reduce credit demands and even impose a dampening effect on credit markets. Similarly, it was also discovered that remittances serve as a substitute for credits with no link to financial inclusion (Ambrosius & Cuecuecha, 2013; Brown, Carmignani, & Fayad, 2013), thus leading to a negative coefficient for this variable.

The Institutional Quality (*INQ*) developed by Kaufmann, Kraay, and Mastruzzi (2008) refers to the measure of institutional development in terms of governance indicators, particularly the rule of law as well as government effectiveness. It is defined as higher value indicates higher institutional. More importantly, institutional quality has been revealed to foster financial development and financial inclusion (Adams-Kane & Lim, 2014, 2016; Guiso et al., 2008a, 2008b; Shad et al., 2018), thus a positive coefficient is expected for this variable.

Human capital (*HC*) is described as knowledge, skills, and experiences possessed by individual workers, which is particularly measured in terms of education. Regarding this matter, remittances help poor recipients to overcome liquidity constraints and investments on human capital (Calero, Bedi, & Sparrow, 2009; Taylor & Wyatt, 1996). According to Dwyfor Evans, Green, and Murinde (2002), human capital positively influences financial development. Contrastingly, Arora (2012) found a negative relationship between financial development and human capital. This study utilized mean years of schooling from the United Nation dataset as the proxy for human capital and it is expected to provide a positive influence on financial inclusion.

In the present study, income (*INC*) was measured by the per capita GDP which is expected to be positively linked to financial development and financial inclusion. Regarding this matter, it is believed that the demands of financial activities tend to be greater in richer countries (César Calderón & Liu, 2003; P. O. Demetriades & Hussein, 1996; S. H. Law & Azman-Saini, 2012; Rojas-Suarez & Amado, 2014; Yang & Yi, 2008).

CPI refers to inflation measured by consumer price index. An increase in money supply leads to inflation which makes loanable funds cheaper, thus reducing cost of borrowing for corporate and individual. In this case, it is expected that people will increase consumption and reduce demand for savings account (English, 1999; Hussan & Masih, 2014; Klapper, Lusardi, & Van Oudheusden, 2015). Therefore, inflation will have an inverse relationship with deposits account.

FD refers to financial development. In the case of the present study, it was measured by broad money. The Theory of Active Financial Development or Supply Leading Financial Development articulates that well-functioning financial intermediaries plays a key role in eliminating financial exclusion and encourages engaging in financial dealings among vulnerable segment of population by creating adequate financial products to respond to the financial needs of people which legitimately met by the financial system, then people will start to interact and open bank accounts (Kumar, 2011; Rasheed, Law, Chin, & Habibullah, 2016). Financial development is expected to have a positive effect on financial inclusion.

Estimation analysis was carried out with descriptive statistics (see Table 1) for all series included in the sample. All the series displayed considerable variations for both across and within the sample countries. This justified the need to use a heterogeneous panel data estimation technique, which enables endogeneity issues. Table 2 presents the Pearson correlation analysis of the series for the sample. Overall, the correlation exercise revealed that the correlation estimates were within a reasonable range (Kennedy, 1985). The highest correlation was found between bank account and

ATM, while the lowest correlation was between bank account and CPI. Correlations among variables with the most interest were low and with reasonable direction, i.e. ranging from 0.187 to 0.623. The correlations between remittances and both proxies of financial inclusion (bank account and ATM), between institutional quality and financial inclusions, as well as between remittances and institutional quality, were positive and seemed to be in accord with prior expectations.

Table 1. Summary of descriptive statistics

Variables	Unit of Measurement	Mean	Overall Std. Dev	Between Std. Dev	Within Std. Dev	Minimum	Maximum
Bank Account	Per 1000 Adults	614.05	512	487.71	132.19	28.15	3379.81
ATM	Per 100,000 adults	29.52	29.06	27.86	6.79	0.09	140.38
Remittances	Constant US\$	120.54	179.96	150.50	99.22	0.78	1322.95
Institutional quality	Scale 0 to 5	1.99	0.617	0.61	0.11	0.56	3.508
Income	Constant US\$	6058.25	10538.24	10413.5	1889.32	249.57	85076.15
Human capital	Unit	7.12	2.87	2.88	0.21	1.40	12.8
Inflation	Percentage	133.68	122.93	75.52	102.28	97.91	2740.27
Financial Development	Percentage	48.96	31.84	32.28	5.43	18.46	258.83

Note: The data for institutional quality containing negative values have been upscale to positive values prior to conducting the logarithm for the analysis.

Table 2. Correlation between series

Variables	Bank Account	ATM	Remittances	Institutional quality	Income	Human capital	Inflation	Financial Development
Bank Account	1							
ATM	0.770*	1						
Remittances	0.238*	0.218*	1					
Institutional quality	0.490*	0.623*	0.187*	1				
Income	0.287*	0.429*	0.0542	0.508*	1			
Human capital	0.651*	0.664*	0.383*	0.456*	0.347*	1		
Inflation	0.129*	-0.036	-0.063	-0.154*	-0.13*	0.039	1	
Financial Development	0.365*	0.3888*	0.448*	0.255*	0.231*	0.247*	-0.136*	1

Note: *** indicates $p < 0.01$, ** indicates $p < 0.05$, and * indicates $p < 0.1$, respectively

3.2 Empirical Model Specification

Since the panel data consisted of $N > 25$ countries and $T < 25$ time periods, the dynamic system GMM method was employed (Raj & Baltagi, 2012). Another reason for selecting this technique is due to its

ability to control endogeneity issue and to remove country-specific effects from the regressions, which appear to be the main problems of other panel data techniques. The empirical model for the present study is specified below as suggested and modified from Demirgüç-Kunt et al. (2011):

$$\text{LnFI}_{it} = \beta_{0i} + \gamma \text{LnFI}_{it-1} + \beta_1 \text{LnMWR}_{it} + \beta_2 \text{LnINQ}_{it} + \beta_3 X_{it} + \eta_t + \lambda_i + \varepsilon_{it} \quad (1)$$

$$i = 1, \dots, 70 \text{ and } t = 1, \dots, 7$$

where β_{0i} refers to a constant term, LnFI_{it-1} describes the lagged dependent variable of financial inclusion. In addition, the present study utilized two proxies, namely the number of bank account holders per 1000 adults as well as the number of ATMs per 100,000 adults in measuring financial inclusion (FI). Meanwhile, MWR postulates the migrant workers' remittances measured as personal remittances received per capita (in USD currency), followed by INQ as the institutional quality. Next, X_{it} is described as the vector of other control variables which include human capital (HC) proxied by the mean years of schooling, the inflation (CPI), and the income (INC) proxied by GDP per capita, and financial development (FD) measured by broad money. Other than that, η_t refers to the time-specific fixed effect, λ_i is the country-specific effect, and ε_{it} is the unobservable error term.

Demetriades and Law (2006), in their study, discovered that financial development is more effective in middle-income economies with abundant effects, especially with the presence of high institutional quality. Hence, in this view, it becomes pertinent to determine whether or not the degree of institutional quality in the remittances recipient countries has an influence on the usage of remittances, which may consequently develop their abilities to raise financial inclusion. Accordingly, this can be achieved by adding the orthogonalized interaction terms as well as the original terms in the financial inclusion equation as shown in Equation (2). Hence, the present study investigated the interaction between these variables as well as the simultaneous effect among the variables. Regarding this matter, it is expected for the simultaneous impact of remittances and institutional quality on financial inclusion to be able to provide a policy direction in determining whether an increase in remittances with higher institutional quality will lead to an increase in financial inclusion (Ruiz, Shukralla, & Vargas-Silva, 2009). Meanwhile, the positive coefficient on the orthogonalized interaction terms indicates that the long-run marginal impact of remittances on financial inclusion tends to be enhanced in recipient countries that possess a better quality of institutions. On the contrary, a negative coefficient on the orthogonalized interaction terms implies that the growth impact of remittances is stronger in recipient countries with weaker institutions. In other words, positive (negative) coefficients on the orthogonalized interaction terms suggest that these variables

can be considered as complements (substitute) in shaping a long-run financial inclusion in remittance recipient developing countries that acted as the samples of the current research.

$$LFI_{it} = \beta_0 + \gamma LFI_{it-1} + \beta_1 LMWR_{it} + \beta_2 LINQ_{it} + \beta_3 MWR_{it} * INQ_{it} + \beta_4 LHC + \beta_5 LINC_{it} + \beta_6 CPI_{it} + \beta_7 FD_{it} + \eta_t + \lambda_i + \varepsilon_{it} \quad (2)$$

In addition, the present study adopted the technique of Brambor et al. (2006) in calculating the marginal effects and standard errors for the interaction term. Accordingly, this allows the evaluation of how the marginal effect of remittances on financial inclusion changes with the degree of institutional quality in remittance recipient countries. As emphasized by Brambor et al. (2006), the total effect of remittance at the margin can be evaluated by examining the partial derivatives of financial development with respect to remittances at the given levels of institutional quality. The conditional marginal effects are described in Equation (3) below:

$$(dlnFI/dlnREM) = \beta_1 + \beta_3 lnINQ \quad (3)$$

The presence of complementary tends to exist between remittance and institutional quality if all the derivatives are positive for the purpose of enhancing financial inclusion. Accordingly, an increase in remittance and institutional quality would lead to more financial inclusion which can be measured through the opening of a bank account. Nevertheless, this is only possible if the parameters β_1 and β_3 are all positive. On the contrary, evidence of substitutability between the interacted variables will exist if the coefficients β_3 is negative. Therefore, the derivatives can be evaluated within the sample provided that the level of institutional quality is varied (Brambor et al., 2006).

The anticipated signs based on the literature of remittances, human capital, income, financial development, institutional quality, and the interaction term of remittances with institutional quality are expected to be positive, whereas inflation is expected to be negative as indicated in Table 3. In the case of the present study, it was anticipated that an increase in remittances with higher institutional quality could increase financial inclusion (Ruiz et al., 2009); hence, interaction term shall carry a positive sign. Finally, the current research also conducted two diagnostics, namely AR(2) Test and Hansen Test for the purpose of checking the consistent and efficient estimation of the long-run parameters of interest. The results of GMM will be considered valid if these two tests are found to be insignificant.

Table 3. Expected signs of coefficients of variables

Variables	Expected signs
Remittances	+ (Positive)
Human capital	+ (Positive)
Income	+ (Positive)
Inflation	- (Negative)
Financial Development	+ (Positive)
Institutional quality	+ (Positive)
Interaction term remittances with institutional quality	+ (Positive)

4. Empirical Results

Table 4 reports the impact of remittances on financial inclusion obtained from the system GMM estimator. As mentioned earlier, the present study utilized two proxies for financial inclusion (FI), namely the number of bank account holders per 1000 adults as well as ATMs per 100,000 adults. In correspond to that, Column 1 and 2 report the model that used bank account as the proxy for FI, while Column 3 and 4 report the model that adopted ATM as the proxy for FI. As can be observed, Column 1 and 3 present the estimation that was carried out by only including the dependent variable, financial inclusion (FI), followed by the main independent variable, remittance (MWR) along with the control variables. On the other hand, Column 2 and 4 introduce an interaction term between remittances and institutional quality (MWR*INQ).

The results showed that the lagged dependent variable is statistically significant in all six models, which clearly implies that the dynamic system GMM is an appropriate estimator. Meanwhile, it should be noted that the empirical results can be relied upon for statistical inference. The insignificance of (AR2) Test and Hansen test shows that all of the models are robust; however, the Hansen test did not reject the over-identification restriction at a 5% significance level. As expected, the null hypothesis of the second-order serial correlation (AR2) is not rejected. Generally, the estimated models in Table 4 seem to be nearly well specified.

It can be observed from Table 4 that remittances carry the expected positive sign and clearly shown to be statistically significant in all models. The evidence of the positive impact of remittances found in the present study is in line with the results of Mundaca (2009), Ramirez (2013), and Boffy-Ramirez (2017) who found the significant positive effect of remittances which reinforces the inclusive effect remittances in the recipient countries. Nevertheless, the results of the current research are not in agreement with the studies conducted by Cesar Calderón et al. (2007); Brown et al. (2013); Ambrosius and Cuezuecha (2013); Chami, Hakura, and Montiel (2012); and Giuliano and Ruiz-Arranz (2009) which reported that the inflow of remittances might not be able to produce a more inclusive financial system.

In addition, it can be seen that the coefficients of institutional quality carry the positive expected sign in all models which are statistically significant. Hence, this suggests that the level of institutional quality in the migrant country of origin tends to have a positive effect on financial inclusion. Meanwhile, the work of Law and Azman-Saini (2012) reported the increase of the role of institutional quality in promoting long-run financial development along with the improvement of quality institutions in the sample countries. This finding is in accordance with the result reported by Ramirez (2013), Ruiz et al. (2009) and El Hamma (2019) which states that the growth impact of remittances is higher in countries with institutional quality.

Moreover, the control-variables which specifically refer to human capital (HC), income (INC), and financial development have managed to meet its expected positive signs and shown to be statistically significant in all models. The current research found the income variable to have a positive long-run effect on financial inclusion, which eventually suggests that income in these countries has experienced an enhanced financial inclusion. The positive income can be explained based on the fact that income increases high potential financial considering they might receive their wages through a bank account which is a safe place to keep their funds (Beck & De La Torre, 2006). The positive sign of human capital is in accordance with the prior expectation of the present study which states that sound or better human capital positively influences financial inclusion. The positive human capital explained by educated individuals who are able to comprehend various financial products has encouraged their access to financial services. These results are also supported by prior studies (Cole, Sampson, & Zia, 2011; Ellis & Lemma, 2010; Kempson, Perotti, & Scott, 2013; Pena, Hoyo, & Tuesta, 2014). In addition, it was discovered that financial development has a positive effect on financial inclusion. In particular, financial development in the form of broad money and spread of banks level of comfort are convenient to the public because it allows them to carry out banking pursuits. These results are in line with prior studies which state that the increase in the number of bank branches will increase efficiency among the banks as well as financial inclusion (Beck & De La Torre, 2006; Beck, Demirgüç-Kunt, & Honohan, 2009; Beck, Demirgüç-Kunt, & Levine, 2007; Beck, Demirgüç-Kunt, & Levine, 2010). Meanwhile, Nitin (2013) also stated that an increase in banking networks has a positive impact on financial inclusion. Other than that, it can be observed that the coefficient of inflation is positive and significant for models that used bank account as the proxy for FI (Column 1 and 2). Unfortunately, the positive sign of inflation contradicts the prior expectation of the present study. The contradicted result indicates that an increase in inflation may encourage the opening of bank accounts, which then improves financial inclusion in the remittances-receiving countries. Overall, it should be understood that inflation can be overcome if individuals

deposit at a bank to gain interest or buy an asset or financial asset rather than holding their cash in hand. Therefore, it is believed that all of these will be able to improve financial inclusion.

As one may observe, Columns 2 and 4 introduce an interaction term between remittances and institutional quality (MWR*INQ). The results show that the positive coefficient managed to be obtained. The positive coefficient on the interaction terms indicates that the impact of remittances on financial inclusion can be enhanced in recipient countries with a better quality of institutions. In other words, institutional quality is an important factor that influences individuals' decision in accessing financial services offered by financial institutions. If the public has trust in the financial institutions, it is believed that the recipients of remittances will keep their excess in financial institutions including using the financial products or services made available by those institutions.

Table 4. Results of GMM estimations of the impact of remittances on financial inclusion

VARIABLES	Bank Account Holder		ATM	
	(1)	(2)	(3)	(4)
Financial Inclusion	0.453*** (0.0587)	0.468*** (0.0584)	0.785*** (0.0105)	0.791*** (0.0103)
Remittances	0.0429*** (0.0112)	0.0403*** (0.0115)	0.0107*** (0.00273)	0.00959*** (0.00254)
Income	0.180*** (0.0649)	0.196*** (0.0632)	0.0811*** (0.00811)	0.0749*** (0.00840)
Human capital	0.233* (0.119)	0.210* (0.118)	0.194*** (0.0228)	0.190*** (0.0233)
Institutions	0.289** (0.132)	0.223* (0.121)	0.143*** (0.0237)	0.128*** (0.0209)
Remittances*Institutions		0.000357* (0.000212)		5.47e-05* (3.00e-05)
Inflation	0.589*** (0.101)	0.598*** (0.0995)	0.00120 (0.0167)	0.00409 (0.0205)
Financial Development	0.250*** (0.0718)	0.260*** (0.0697)	0.0662*** (0.0136)	0.0683*** (0.0144)
Constant	-2.673*** (0.710)	-2.885*** (0.671)	-0.740*** (0.150)	-0.708*** (0.161)
AR(2)	0.81	0.88	0.11	0.11
Hansen Test	0.23	0.19	0.56	0.57
Marginal Effect				
Minimum		0.0401*		0.00956*
Mean		0.0405*		0.00962*
Maximum		0.0408*		0.00966*

Note: Standard errors in parentheses, *** indicates $p < 0.01$, ** indicates $p < 0.05$, and * indicates $p < 0.1$, respectively
Source: Authors' compilation from software

Next, the partial derivative of financial inclusion with respect to remittances described in Equation (3) was considered for the purpose of conducting a further evaluation on how the marginal effect of remittances on financial inclusion changes with the degree of institutional quality in remittance recipient countries. The partial derivative of financial inclusion with respect to the remittance at the minimum, mean, and maximum level of institution quality is reported in Column 2 and 4. As can be observed, the results indicated that all of the coefficients are statistically significant and carry a positive sign. The result is consistent with the finding that remittances tend to carry a positive sign in all models. Most importantly, it can also be observed that the positive effects seem to get larger as a result of the improved level of institutional quality. The proportion of these derivatives at different levels of institutional quality showed that marginal growth effect of remittances on financial inclusion rises due to the increase in the degree of institutional quality. In other words, countries with better institutions will gain the most benefits from the positive growth effect of remittances considering that individuals will have better financial stability due to the enhanced level of institutional quality.

5. Concluding Remarks

In the present study, the long-run impact of remittances on financial inclusion was successfully examined by taking into account the role of improved institutional quality in remittances-receiving countries. Moreover, the current research managed to achieve the objective using a panel dataset for 70 developing countries over the period of 2011-2018 through the adoption of the Generalized Method of Moments estimation technique.

The results obtained by the current research revealed that the long-run impact of remittances on financial inclusion is positive, while financial inclusion tends to increase with better institutional quality. These results seem to support the studies reported so far. The present study also found evidence that the effect of remittances on financial inclusion is conditional depending on individuals' perception of institutions. This finding sheds new light that positive perception of the public towards financial institutions does matter. Put simply, trust of remittances recipients towards financial institutions can further enhance the impact of remittances on financial inclusion.

The plausible explanation might be that the volume of remittances enables the recipients to have excess cash, which translates into the demand for deposit accounts. Apart from that, this also paves a way for them to gain access to other potential products such as payment or even credit (Ambrosius & Cuecuecha, 2013). These demands, in turns, can be accommodated via an increase in the provision of financial services or the maintenance of people perception against financial institutions. Hence,

this clearly indicates that remittances could enhance the accessibility to financial services among the recipients. Moreover, an increase in remittances encourages the usage of formal financial services with a positive perception of financial institutions. Therefore, it is deemed necessary to improve trust to financial institution and government in the remittance's recipient countries by promoting the opening of a bank account at financial institutions. The findings are in line with Fromentin (2017) who found strong evidence supporting the view that remittances promote financial development in developing countries in the long term.

The policy implication of this finding is that the countries have to improve their governance as well as instill positive perception about financial institutions to enable those involved to enjoy the benefits of receiving remittances and growth of the financial sector. Enhancing the institutional quality of financial institutions, such as reducing bureaucratic processes, improving credit allocation, strengthening credit regulation, ensuring higher transparency, and reinforcing information disclosure in the financial sector, can instill positive perception amidst the public towards financial institutions. Trust on financial institutions encourages the public to open bank accounts, while sustaining the trust of clients during banking transactions is important for them to use other financial services provided by banks, thus promoting financial inclusion.

Finally, the comparison of linkages between remittances and financial inclusion in countries based on different characters such as income level and the geographical situation is recommended for future research. On another note, it is suggested for future work to employ other control variables such as interest rate and urbanization growth considering that it would lead to a more interesting result. Future researchers also may look into the nonlinear impact of remittances on financial inclusion.

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Appendix

Table A1: List of countries included in our sample

Sub-Sahara Africa		South Asia		MENA	
1	Benin	29	Afghanistan	51	Algeria
2	Botswana	30	Bangladesh	52	Egypt, Arab Rep.
3	Burkina Faso	31	Maldives	53	Kuwait
4	Burundi	32	Pakistan	54	Lebanon
5	Cabo Verde	Europe and Central Asia		55	Qatar
6	Cameroon	33	Azerbaijan	56	Saudi Arabia
7	Comoros	34	Croatia	57	Syrian Arab Republic
8	Congo, Rep.	35	Georgia	58	Tunisia
9	Cote d'Ivoire	36	Hungary	59	Yemen, Rep.
10	Gabon	37	Kyrgyz Republic	Latin America and Caribbean	
11	Ghana	38	Moldova	60	Belize
12	Guinea	39	Poland	61	Colombia
13	Guinea-Bissau	40	Tajikistan	62	Costa Rica
14	Kenya	41	Ukraine	63	Dominican Republic
15	Lesotho	42	Uzbekistan	64	Ecuador
16	Madagascar	East Asia and Pacific		65	Haiti
17	Malawi	43	Lao PDR	66	Paraguay
18	Mali	44	Mongolia	67	Peru
19	Namibia	45	Myanmar	68	Uruguay
20	Niger	46	Palau	69	Venezuela, RB
21	Nigeria	47	Samoa	70	Argentina
22	Rwanda	48	Solomon Islands		
23	Senegal	49	Thailand		
24	Seychelles	50	Vanuatu		
25	Tanzania				
26	Togo				
27	Uganda				
28	Zimbabwe				

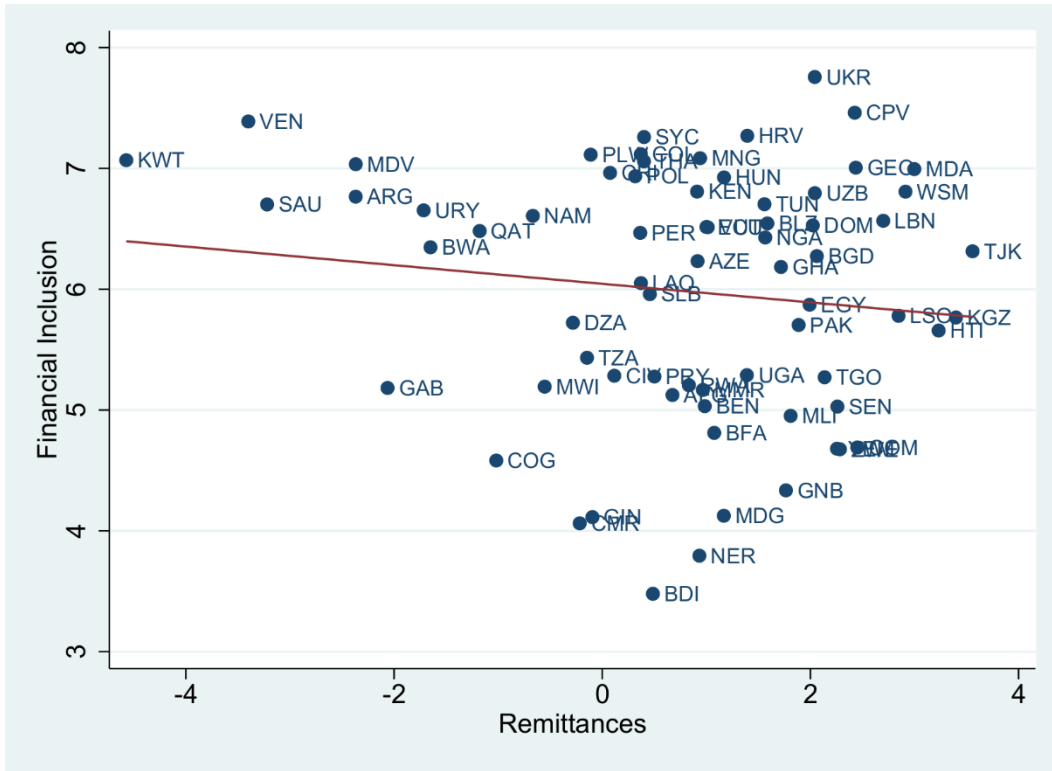
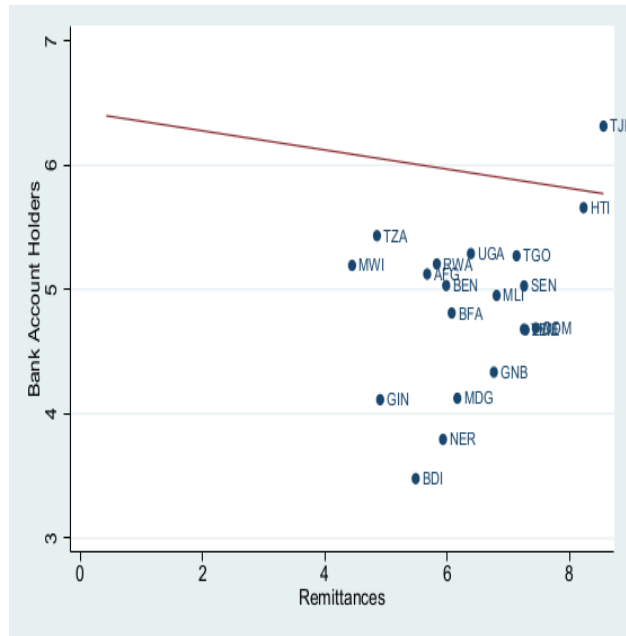


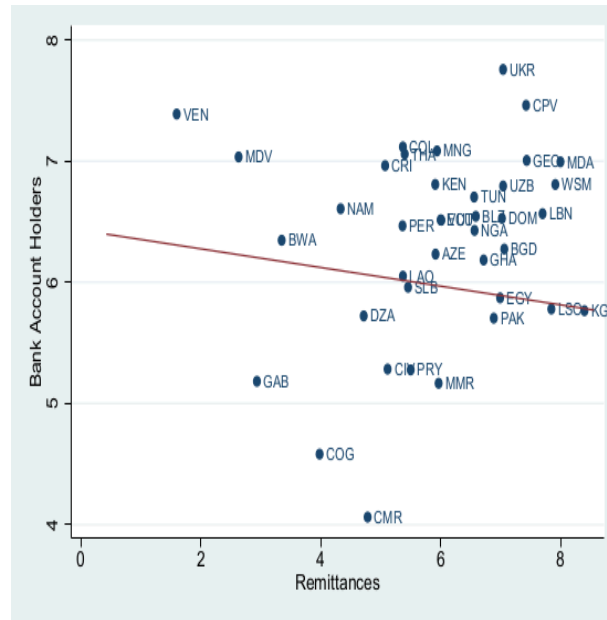
Figure A1: Remittances and Financial inclusion (Bank account holders) in 2011-2018

Note: The list of 70 sample countries is provided in Table A1 in Appendix.

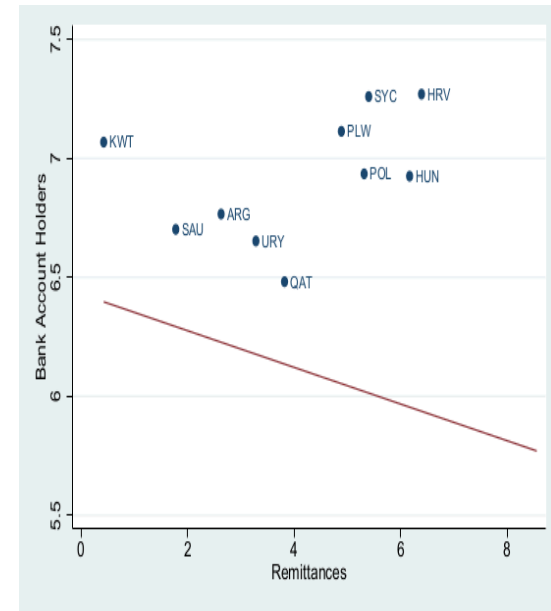
Source: Authors' compilation from World Bank data (2018)



Low Income countries



Middle Income countries



High Income countries

Figure A2: Remittances and Financial inclusion (Bank account holders) in 2011-2018 according to Income Group