# Globalization and Female Economic Participation in MINT and BRICS countries

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## Abstract

This study examines the effect of globalization on female economic participation (FEP) in MINT (Mexico, Indonesia, Nigeria & Turkey) and BRICS (Brazil, Russia, India, China & South Africa) countries between 2004 and 2018. Four measures of globalization are employed and sourced from KOF globalization index, 2018, while the female labour force participation rate is a proxy for FEP. The empirical evidence is based on Pooled Mean Group (PMG) estimators. The findings of the PMG estimator from the Panel ARDL method reveal that political and overall globalization in MINT and BRICS countries have a positive impact on FEP, whereas social globalization exerts a negative impact on FEP in the long-run. It is observed that economic globalization has no long-run effect on FEP. Contrarily, all the measures of globalization posit no short-run effect on FEP in the short-run. This supports the argument that globalization has no immediate effect on FEP. Thus, it is recommended that both MINT and BRICS countries should find a way of improving the process of globalization generally to empower women to be involved in economic activities. This study complements the extant literature by focusing on how globalization dynamics influence FEP in the MINT and BRICS countries.

*Keywords*: Globalization; female; gender; labour force participation; MINT and BRICS countries
*JEL Classification*: E60; F40; F59; D60

## 1. Introduction

Four motivational elements motivate the focus of a study on the dynamics of globalization and female employment in MINT (Mexico, Indonesia, Nigeria & Turkey) and BRICS (Brazil, Russia, India, China and South Africa) countries. These include: (i) the comparatively low involvement of women in formal economic activities in developing countries, when compared with their more advanced-counterparts; (ii) the importance of giving globalization a gender-inclusive face; (iii) the policy importance of gender inclusion in sustainable development goals (SDGs) and (iv) gaps in the gender inclusive development literature. The four underlying elements are expanded following the same highlighted chronology.

First, women are comparatively less represented in political circles and formal economic activities in developing countries relative to their counterparts in more developed countries. Accordingly, in majority of developing countries, when females are not predominantly involved in subsistence agriculture, they are either house wives or involved in informal business activities (Food and Agricultural Organisation-FAO, 2011; Efobi, Tanankem and Asongu, 2018; Ellis et al., 2007; Ramani et al., 2013; Tandon and Wegerif, 2013; Asongu and Odhiambo, 2018, 2019a; Uduji and Okolo-Obasi, 2019, 2020). Furthermore, there is a growing stream of literature on the imperative to involve more females in formal politico-economic activities in order to optimally use human resources for economic development (Rice and Barth, 2017; Luo, et al., 2017; Marquez, 2017; Moras, 2017; Uduji, Okolo-Obasi and Asongu, 2019; Vancil-Leap, 2017; Uduji and Okolo-Obasi, 2018).

Second, there are evolving arguments in the literature positing that globalization should be tailored to engender more inclusive and sustainable development outcomes (Jorgenson and Clark, 2010, 2012a, 2012b; Asongu and Nwachukwu, 2017a; Osinubi and Olomola, 2020; Tchamyou, 2019, 2020a, 2020b). The underlying positions in the literature are partly motivated by a complementary strand of studies on the importance of gender inclusion in the achievement of post-2015 gender-oriented SDGs.

Third, gender inclusion features prominently in the SDGs agenda, partly because in the light of growing globalization (United Nations-UN, 2013), public support for it is decreasing, particularly for dynamics of globalization that contribute toward exclusive development (Asongu et al., 2020). In essence, beyond the above considerations, the concern of female empowerment in the era of globalization is particularly relevant (Oostendorp, 2009)in the light of increasing

evidence on discrimination against women in developing countries (Hazel, 2010; Elu and Loubert, 2013; Osabuohien et al., 2019), which is partly the externalities of globalization. To put this in more perspective, the report by the World Bank has shown that globally, countries lose about $160 Trillion in wealth due to gaps between men and women (World Bank, 2018).

Fourth, the positioning of this study on how globalization influences gender economic inclusion in the MINT and BRICS countries is also motivated by an apparent gap in the scholarly literature. While stylized facts motivating the relevance of MINT and BRICS countries  as well as the theoretical underpinnings are discussed in Section 2, the attendant literature that the present study departs from has largely  focused, *inter alia*: the importance of promoting the female gender in science education (Elu, 2018; Marra, 2020); gender inclusion in financial access (Mannah-Blankson, 2018; Bayraktar and Fofack, 2018; Morsy, 2020; Nanziri, 2020); nexuses between information and communication technology (ICT) and financial access (Efobi et al., 2018; Bongomin et al., 2018); connections between ICT, corporate social responsibility and involvement of women in the agricultural industry (Uduji  and Okolo-Obasi, 2018, 2019, 2020;  Uduji et al.,2019) and linkages, between inequality, governance, ICT, financial access and gender economic inclusion (Asongu et al., 2020b; Asongu and Odhiambo, 2020a, 2020b, 2020c, 2020d). The present study departs from this strand of literature by focusing on the role of globalization in selected developing (i.e. BRICS and MINT) countries. The stylized facts motivating the selection of these countries are discussed in Section 2.

The rest of the study is organized as follows. The stylized facts and theoretical underpinnings are provided in Section 2 while the data and methodology are covered in Section 3. Section 4 presents and discusses the findings whereas Section 5 concludes with implications and future research directions.

**2.0 Stylized facts and theoretical underpinnings**

**2.1 Stylized fact**

Consistent with Asongu et al. (2018), the importance of MINT and BRICs countries in the process of globalization can be articulated with various indicators as apparent in Table 1. For instance, in relation to foreign investment, foreign direct investment (which is the financial openness side of globalization) engenders financial resources via investment and taxes, provides investment avenues and produces spillover ramifications such as technology, skill transfer,

shared expertise in management and enhanced practices in corporate governance (Tchamyou, 2017). Moreover, investments from international corporations which is a significant characteristic of BRICS and MINT countries is associated with other advantages linked to multilateral and bilateral trade policies which potentially have an incidence on socio-economic development outcomes in the light of attendant globalization- "inclusive development" literature (Asongu and Nwachukwu, 2017b).

From Table 1, in the light of a World Investment Report from the United Nations Conference on Trade and Development (UNCTAD), MINT and BRICS countries account for significant world trade and foreign investment (i.e. proxies for respectively trade and financial globalization) (UNCTAD, 2013; World Bank, 2013; US Department of State, 2013). According to the narrative, BRICS countries have been recognised in most policy and scholarly circles as fast growing developing countries that are leveraging on positive externalities of globalization to produce a burgeoning middle class and advance in technology and innovation. The MINT is another group of countries that has emerged which share common feature with the BRICS countries. The first common characteristic is a growing youth population compared to the shrinking and ageing population in more technically-advanced contries. The second feature partly pertains to the proximity of MINT countries with the BRICS and more advanced countries and hence, MINT countries can leverage on large nearby markets. For instance: (i) Indonesia is near China; (ii) Turkey shares a frontier with the European Union; (iii) Mexico is at the doorstep of the USA while (iv) Nigeria is the second largest economy in Africa and has the highest population in the continent.

In the light of the above, the dominance of MINT and BRICS countries in trade and financial globalization as well as significance in a plethora of major economic development features shown in Table 1 (i.e. GDP per per capita, GDP growth, GDP per capita growth, Foreign Direct Investment inflows, Populatio growth, population, natual resource and the human development index), justifies a focus on the sampled countries within the context of asessing how various dynamics of globalization have affected socio-economic development in the perspective of gender economic participation.

**Table 1:** Stylized facts on BRICS and MINT

| | GDP (constant 2005 US$, billions) | GDP per capita (constant 2005 US$) | GDP growth (annual %) | GDP per capita growth (annual %) | FDI net inflows (BoP, current US$, billions)* | Population growth (annual %) | Population, total, millions | Natural resources, Share of GDP* | Human Development Index (HDI) |
|---|---|---|---|---|---|---|---|---|---|
| Brazil | 1136.56 | 5721.23 | 0.87 | 0.00 | 71.54 | 0.87 | 198.66 | 5.72 | 0.73 |
| China | 4522.14 | 3348.01 | 7.80 | 7.28 | 280.07 | 0.49 | 1350.70 | 9.09 | 0.70 |
| India | 1368.76 | 1106.80 | 3.24 | 1.94 | 32.19 | 1.26 | 1236.69 | 7.36 | 0.55 |
| Indonesia | 427.47 | 1731.59 | 6.23 | 4.91 | 19.24 | 1.25 | 246.86 | 10.00 | 0.63 |
| Mexico | 997.10 | 8250.87 | 3.92 | 2.65 | 21.50 | 1.24 | 120.85 | 9.02 | 0.78 |
| Nigeria | 177.67 | 1052.34 | 6.55 | 3.62 | 8.84 | 2.79 | 168.83 | 35.77 | 0.47 |
| Russia | 980.91 | 6834.01 | 3.44 | 3.03 | 55.08 | 0.40 | 143.53 | 22.03 | 0.79 |
| South Africa | 307.31 | 6003.46 | 2.55 | 1.34 | 5.89 | 1.18 | 51.19 | 10.64 | 0.63 |
| Turkey | 628.43 | 8492.61 | 2.24 | 0.94 | 16.05 | 1.28 | 74.00 | 0.84 | 0.72 |

Source of data: UNDP (2013), World Bank (2013), Asongu et al. (2018).

## 2.2 Theoretical highlights

Consistent with Asongu (2013), the theoretical basis for the nexus between globalization and gender economic participation can be viewed from two contrasting/contending schools of thought, namely: the hegemonic and neoliberal viewpoints. These are substantiated in the same chronology as highlighted.

First, the neoliberal school of thought posits that, globalization is an indispensable phenomenon of "creative destruction" with respect to the manner in which a plethora of other development prospects are influenced by it, notably, technological innovations, global trade, production efficiency and investment across borders (Tsai, 2006). Accordingly, with globalization, employees are constantly improving their skills and adapting the evolution of work environments owing to, *inter alia*, declining wages and replacement of old job descriptions with new employment avenues. Hence, under these conditions, women can be trained to take opportunities offered by the neoliberal perspective of globalization. The favourable prospect of participation of more females in the formal labour force owing to globalization is broadly

consistent with Grennes (2003) who has posited that the rewards of globalization are apparent when the domestic labour market is responsive to changes in the supply and demand for labour. Accordingly, in responding to the attendant changes, policies at the domestic level could be tailored to train more women in sectors and activities that guarantee more job prospects. These potential benefits of globalization for employment and by extension, enhanced gender economic participation are consistent with: (i) Firebaugh (2004) who has maintained that the phenomenon of globalization promotes the industrialisation process in developing nations and (ii) Rodrik Subramanian and Trebbi. (2004) who posit that the globalization process improves standards of institutions which are relevant in promoting other development externalities, such as gender economic inclusion.

Second, the hegemonic school is of the perspective that the globalization project is a disguised agenda which is designed to increase the riches of wealthy nations and make less developed countries even poorer. This is broadly confirmed by Petras and Veltmeyer (2001) who advance that the phenomenon is aimed at establishing a new global order in which developed countries and multilateral development institutions promote the accumulation of capital and competition in the free market. The authors predict: "*a world-wide crisis of living standards for labor*", given that most of the unfavorable consequences have affected the working class as "*technological change and economic reconversion endemic to capitalist development has generated an enormous growing pool of surplus labor, an industrial reserve army…with incomes at or below the level of subsistence*" (Petras and Veltmeyer, 2001, p. 24). In view of Asongu (2013), social democracy has fundamentally been undermined by the globalization project. Other scholarly positions supporting the narrative in this school of thought include: (i) Smart (2003) and Tsai (2006) who have established that globalization reflects a "market ethos" which has a private aim that is in complete disregard for citizenry welfare; (ii) Sirgy et al. (2004) on the negative consequences of globalization and (iii) Scholte (2000) on the skewed benefits of globalization in favor of the wealthier elements of society.


**3.0    Methodology**

This section describes the data, model specification, and the estimation technique employed in achieving the objective of the study.

*3.1 Data*

Annual data on all the variables of interest in nine countries {Mexico, Indonesia, Nigeria, Turkey (MINT), Brazil, Russia, India, China, and South Africa, (BRICS)} are used over the period 2004-2018. All the data employed are sourced from the World Development Indicators (WDI) of the World Bank in 2018, except the globalization variables that are gathered from the Konjunjturforschungsstelle (KOF) globalization index, 2018. All the variables are in their level forms. The description of the variables is shown in Table 2.

**Table 2: Data Description**

| Variables | Symbols | Descriptions | Sources |
|---|---|---|---|
| Female Economic Participation | FLP | Labor force participation rate, female (% of female population ages 15+) (modeled ILO estimate) | WDI |
| Globalization | GBI | Overall globalization | KOF Globalization Index |
| | EGB | Economic globalization | |
| | SGB | Social globalization | |
| | PGB | Political globalization | |
| Primary and Secondary School | PSE | School enrolment, primary and secondary (gross), gender parity index (GPI) | WDI |
| Economic Growth | GDP | Gross domestic product growth (% of annual) | WDI |
| Remittances | REM | Remittance inflows to GDP (%) | WDI |
| Population Growth | POP | Population growth (% of annual) | WDI |
| Mobile Phones | MOB | Mobile Cellular subscriptions (per 100 people) | WDI |

WDI: World Bank Development Indicators of the World Bank. ILO: International Labour Organisation.
***Source: Authors' Compilation (2020)***

### 3.2 Model Specification

Following Asongu et al.(2020), the study uses the stated model in equation 1 to study the nexus between globalization and female/women economic participation. The model states that female economic participation depends on globalization and other control variables as shown in Equation 1.

$$FEP_{it} = \kappa_i + \lambda GBV_{it-1} + \varpi C_{it} + \varepsilon_{it} \tag{1}$$

From equation (1), FEP represents women economic participation, GBV denotes a vector of the different globalization variables employed in this study, C indicates the vector of control variables, and $\varepsilon$ stands for the error term. "i" and "t" represent the countries under consideration and time period, respectively: that is, MINT and BRICS countries, and the time frame, 2004-2018, to be covered in this study. It is worthwhile to note that the previous values of

globalization variables (i.e. t-1) are used because it is believed that globalization would not have an immediate effect on women economic participation as argued by Asongu*et al. (2020).* This implies that the previous value of globalization would affect the current value of women economic participation. In other words, non-contemporary globalization affects contemporary female economic participation. The modeling approach addresses the concern of simultaneity (i.e. an aspect of endogeneity) while at the same takes on board the perspective that the incidence of globalization on the female economic participation in the present depends on globalization policies in the past.

The study uses female labour force participation rate (FLP)as a measure of female economic participation. In line with Asongu *et al.* (2020) and Efobi*et al.* (2018), the female labour force participation is employed because it shows women's involvement in economic activities and it is a good proxy for economic participation. For the globalization variables, the study considers the three dimensions of globalization with the overall globalization index. These dimensions include economic, social, and political globalization, while the overall globalization index is an index generated from the three dimensions. This study, therefore, is consistent with Asongu *et al.* (2020) in using all these indicators of globalization. The uniqueness of this study lies in the fact that it uses different dimensions of globalization as against other studies, such as Wacker, Cooray, and Gaddis (2017), that use only economic globalization-foreign direct investment, trade openness, and financial globalization to establish that globalization can be used to explain women economic participation in both the MINT and BRICS countries.

The control variables include primary and secondary school enrolment, gender parity index (PSE), growth rate of gross domestic product (GDP), remittances inflows (REM), population growth (POP), and the use of mobile phones (MOB). The listed variables are added to the model because they are considered to be important in determining the involvement of women in economic activities. To start with, an increase in GDP growth rate is expected to affect women economic participation positively but this contradicts the findings of Wacker, Cooray, and Gaddis (2017) and Asongu *et al* .(2020) where improved economic growth reduces women economic participation. This shows that economic growth has a mixed effect on women economic participation. In the same spirit, remittances inflows can either increase or reduce women economic participation. The intuition here is that if the remittances inflows are used

majorly for consumption and not for investment purposes, then it will reduce women economic participation and if otherwise, it will increase women economic participation. In tandem with other studies, such as Asongu *et al.* (2020) and Steinberg and Nakane (2012), female school enrolment is included in the model. Whereas, human capital development among females as measured by female primary and secondary school enrolment is expected to increase women economic participation (Asongu *et al.,* 2020; Wacker, Cooray, and Gaddis, 2017). An increase in the number of people living in a particular area (population) would reduce the involvement of women in economic activities particularly if more jobs are not created as the population increases. Lastly, in this age of technology, we expect the use of mobile phones (which is one of the measures of social globalization) if used for economic activities to increase women participation in economic activities.

### *3.3 Technique of Estimation*

After specifying the model needed to achieve the objective of the study, we next introduce the technique of estimation to be employed. A Panel Autoregressive Distributed Lag (PARDL) model is used in this study. This panel estimation is preferred to other panel analysis (such as generalised method of moments, fixed effects and random effects) because since it produces both short- and long-run estimates, it can be used if the sample period is short, and is reliable if the number of countries (N) is less than the sample period (T) which is the case of this study (Olomola and Osinubi, 2018). The number of countries involved in this study is nine (Mexico, Indonesia, Nigeria, Turkey, MINT, Brazil, Russia, India, China, and South Africa, BRICS). The re-parameterized PARDL(m,n,…..n) model is given in Equation 2.

$$\Delta Y_{it} = \phi_i (Y_{i,t-1} - \gamma_i X^I_{it}) + \sum_{h=1}^{m-1} \alpha_{ij} \Delta Y_{i,t-h} + \sum_{h=0}^{n-1} \beta_{ij} \Delta X_{i,t-h} + \theta_i + \varepsilon_{it} \qquad (2)$$

where $\Delta$ is the difference operator, Y is FEP and X represents all the independent variables. $\phi_i = -(1-\delta_i)$ which is the group-specific speed of adjustment coefficient and it is expected to be less than 0. $X^I_{it}$ denotes vector of long-run relationships. The error correction term (ECT) is given as $(Y_{i,t-1} - \gamma_i X^I_{it})$. $\alpha_{ij}$ and $\beta_{ij}$ are the short-run dynamics. The lag lengths for both

explained and explanatory variables are m-1 and p-1, respectively. $\theta$ and $\varepsilon$ represent the constant and error term, respectively.

The study uses the pooled mean group (PMG) estimator in estimating the PARDL regression. The PMG is said to be more efficient than the mean group (MG) estimator if the Hausman Test is not significant (p-value > 0.05) which amounts to accepting the null hypothesis of no significant difference between MG and PMG, meaning that PMG is more efficient. The PMG has its merit in that it combines both averaging and pooling of coefficients (Pesaran, Shin, and Smith, 1997; 1999). The method also assumes long-run slope homogeneity which implies that the long-run coefficients are the same across groups but assumes short-run slope heterogeneity, meaning that the short-run coefficients differ across groups. In this case, PMG would enable us to analyse the cross-section short-run coefficients. Finally, the PMG estimator helps in choosing an appropriate lag structure for both endogenous and exogenous variables to solve the problem of endogenous regressors (Attard, 2019).

## 4.0 Results

### 4.1 Preliminary Analysis

Table 3 presents the summary statistics of the variables of interest. The discussion would be majorly on the primary variables, women economic participation, and globalization. The average rate of female labour force participation rate (FLP) is 46.63% in both MINT and BRICS countries. The highest and lowest FLP is recorded in BRICS countries. China has the highest FLP, while India has the lowest highest FLP. This is not surprising looking at the rate at which the Chinese economy is growing and moving towards becoming the world leader. The experience of India with the lowest FLP could be a result of its growing population. On the globalization variables, the average rates of overall globalization (GBI), economic globalization (EGB), social globalization (SGB), and political globalization (PGB) are 63.94%, 49.34%, 55.85%, and 86.59%, respectively. The maximum values for these variables are respectively 73.80% (Mexico), 63.30% (Indonesia), 71.90%(Russia) and 93.60% (Mexico), while the minimum values are 49.30% (Nigeria), 34.40% (Brazil), 24.60% (Nigeria), and 74.50% (Mexico), respectively. The highest levels of overall and political globalization are reported in Mexico, while Indonesia and Russia have the highest EGB and SGB, respectively. On the other hand, Nigeria records the lowest GBI and SGB, while Brazil and Mexico have the minimum

values of EGB and PGB, respectively. In sum, all the variables are consistent since their mean values fall within the minimum and maximum values and also, they have small standard deviation which shows that they do not deviate from their mean values.

To solve the problem of multicollinearity, this study uses a 0.70 threshold as proposed by Kennedy (2008). The correlation matrix in Table 4 reveals that FLP is not highly correlated with any of the independent variables. Also, GBI has a high degree of association with the dimensions of globalization, except PGB. SGB and MOB are highly correlated with a coefficient value of 0.75 and this calls for its exclusion in the social globalization model (i.e. Model 2) in the subsequent tables. This coefficient value of 0.75 shows that the use of mobile phones is one of the measures employed in obtaining the social globalization index. Other variables do not exceed the threshold value and this helps in solving the problem of multicollinearity.

We proceed to examine the order of stationarity of the variables under consideration (see Table 5). Even though the PARDL allows for different orders of integration, it is still very crucial to carry out the stationarity test to ensure that none of the variables is integrated of order 2, that is, it is stationary at the second difference. In doing this, the study uses Im, Pesaran, and Shin (IPS)test with intercept only to determine the order of integration. As shown in Table 3, there is a mixture of I(0) and I(1). Specifically, FLP, EGB, PSE, and MOB are stationary at the first difference, that is, they are integrated of order one (I(1)), while GBI, SGB, PGB, GDP, REM, and POP are stationary at levels, meaning that, they are integrated of order zero (I(0)). These findings also support the adoption of PARDL.

**Table 3: Descriptive Statistics**

| Variables | Mean | Std. Deviation | Minimum | Maximum |
|:---:|:---:|:---:|:---:|:---:|
| FLP | 46.63 | 12.30` | 20.71 | 67.67 |
| GBI | 63.94 | 5.53 | 49.30 | 73.80 |
| EGB | 49.34 | 6.47 | 34.40 | 63.30 |
| SGB | 55.85 | 10.96 | 24.60 | 71.90 |
| PGB | 86.59 | 5.31 | 74.50 | 93.60 |
| PSE | 0.99 | 0.05 | 0.83 | 1.10 |
| GDP | 4.77 | 3.54 | -7.80 | 14.23 |
| REM | 1.48 | 1.80 | 0.11 | 8.31 |
| POP | 1.21 | 0.70 | -0.40 | 2.68 |
| MOB | 86.10 | 39.90 | 4.62 | 165.66 |

Note: FLP: Female labour force participation rate. GBI: Overall globalization. EGB: Economic globalization. SGB: Social globalization. PGB: Political globalization. PSE: Primary and secondary school enrolment. GDP : Gross domestic product growth rate. REM : Remittance inflows. POP: Population growth. MOB: Mobile cellular subscriptions.

**Table 4: Correlation Analysis**

| Variables | FLP | GBI | EGB | SGB | PGB | PSE | GDP | REM | POP | MOB |
|---|---|---|---|---|---|---|---|---|---|---|
| **FLP** | 1.00 | | | | | | | | | |
| **GBI** | -0.12 | 1.00 | | | | | | | | |
| **EGB** | -0.06 | 0.70 | 1.00 | | | | | | | |
| **SGB** | -0.02 | 0.88 | 0.43 | 1.00 | | | | | | |
| **PGB** | -0.26 | 0.46 | 0.09 | 0.16 | 1.00 | | | | | |
| **PSE** | 0.02 | 0.33 | 0.07 | 0.50 | -0.08 | 1.00 | | | | |
| **GDP** | 0.001 | -0.27 | -0.11 | -0.45 | 0.21 | -0.19 | 1.00 | | | |
| **REM** | -0.19 | -0.56 | -0.29 | -0.63 | -0.10 | 0.38 | 0.05 | 1.00 | | |
| **POP** | 0.28 | -0.48 | -0.10 | -0.53 | -0.27 | -0.48 | -0.01 | 0.68 | 1.00 | |
| **MOB** | 0.16 | 0.64 | 0.14 | 0.75 | 0.29 | 0.34 | -0.50 | -0.45 | -0.39 | 1.00 |

Note: FLP: Female labour force participation rate. GBI: Overall globalization. EGB: Economic globalization. SGB: Social globalization. PGB: Political globalization. PSE: Primary and secondary school enrolment. GDP : Gross domestic product growth rate. REM : Remittance inflows. POP: Population growth. MOB: Mobile cellular subscriptions.

**Table 5: Unit Root Test**

| | IPS Test | | | |
|---|---|---|---|---|
| **Variables** | **I(0)** | **I(1)** | **Order** | **Status** |
| **FLP** | -0.64 | -2.17** | I(1) | **I(1)** |
| **GBI** | -1.91** | - | I(0) | **I(0)** |
| **EGB** | -0.41 | -5.41*** | I(1) | **1(1)** |
| **SGB** | -2.85*** | - | 1(0) | **1(0)** |
| **PGB** | -3.00*** | - | 1(0) | **I(0)** |
| **PSE** | 0.01 | -3.14*** | I(1) | **1(1)** |
| **GDP** | -1.81** | - | 1(0) | **1(0)** |
| **REM** | -2.37*** | - | 1(0) | **1(0)** |
| **POP** | -3.66*** | - | 1(0) | **1(0)** |
| **MOB** | -1.24 | -1.32* | I(1) | **1(1)** |

Note: ***, **, and * denote 1%, 5%, and 10% levels of significance, respectively.
t-statistics are only reported.

FLP: Female labour force participation rate. GBI: Overall globalization. EGB: Economic globalization. SGB: Social globalization. PGB: Political globalization. PSE: Primary and secondary school enrolment. GDP : Gross domestic product growth rate. REM : Remittance inflows. POP: Population growth. MOB: Mobile cellular subscriptions.

### 4.2 Globalization and Female Economic Participation

This section is to discuss the relationship between globalization and female economic participation in the MINT and BRICS countries. The insignificant probability values of the Hausman tests (HT) confirm the efficiency of the PMG estimator over the MG estimator, and almost all the estimates from the MG technique are insignificant. Table 6 provides the panel

analysis of the short- and long-run relationships between globalization and female economic participation in MINT and BRICS countries, while Tables7 and 8 give the cross-section short-run estimates in each of the countries under consideration. The assumption of short-run slope heterogeneity under the PMG estimator brings about Tables7 and 8. This shows that the short-run estimates differ across the countries. There are four models in all and each model deals with one of the dimensions of globalization. Globalization variables are not used together in one model due to the problem of multicollinearity, so also social globalization and mobile phones.

The error correction terms (ECT) in Table 6 signifies that there is a long-run relationship between female economic participation and each of the measures of globalization, except for the economic globalization. However, the short-run estimates are found to be insignificant in all the countries except for a significant negative relationship that exists between population growth and female economic participation while using social globalization as a measure of globalization. The implication is that all the exogenous variables, except population growth in Model 2 have no short-run effect on female economic participation in the countries of interest.

The long-run estimates in Model 1 in Table 6 are not reported since the ECT for economic globalization is not significant. All the estimates in Table 5 are relatively stable. It is shown in Table 6 that social globalization reduces women's participation in economic activities, while political and overall globalization increases the female participation rate in all the countries under consideration. These findings are not consistent with Asongu *et al.* (2020) except for the overall globalization that agrees with their study. The negative effect of social globalization on female economic participation means that social globalization, probably as a result of the use of mobile phones, reduces women's participation in economic activities. The result is not surprising as most women use their phones for social activities and not for economic activities.

For the overall and political globalization, the results imply that women economic participation would increase in MINT and BRICS countries due to the involvement of women in politics and also, the creation of jobs through the number of treaties signed by these countries and the number of embassies in the said countries. Female education, economic growth, and remittances show contradictory effects on FLP. With social and political globalization, education and economic growth increase female labour force participation rate, while with overall globalization, the two control variables reduce FLP. The positive effect of education on FLP agrees with the findings of

Asongu *et al.* (2020) and Wacker, Cooray, and Gaddis (2017). This reveals that education affords women the opportunities of securing jobs and be involved in economic activities. Remittance flows have a negative effect on FLP in Models 3 and 4, while its effect on FLP is positive in Model 2. The negative relationship could be that women use the remittance flows mostly for consumption purposes. Moreover, remittances have been documented not to be pro-poor because majority of those migrating abroad from developing countries (i.e. who later send remittances back home) are from rich households (Meniago and Asongu, 2018; Tchamyou, Erreygers and Cassimon, 2019). As expected, increases in population growth and the use of mobile phones also dampen women's participation in MINT and BRICS countries regardless of the measure of globalization. This narration shows that as the population keeps growing, the limited jobs available might not be sufficient, hence reducing female labour force participation, while the use of mobile phones in line with social globalization could be that women mostly use their phones for social activities that might dampen their participation in economic activities.

By allowing for heterogeneity across countries, Tables 7 and 8 present the cross-section short-run estimates in MINT and BRICS countries, respectively. In Mexico, economic and social globalization spurs FLP, while political and overall globalization dampens FLP. The effect of economic growth on FLP produces a mixed effect: economic growth, with economic and social globalization, reduces FLP, while it adds to FLP, with political and overall globalization. Remittance inflows positively influence FLP with economic and political globalization. In the same spirit, the use of mobile phones has a positive effect on FLP irrespective of the proxy of globalization. Education and population growth do not have any significant effect on FLP in Mexico, Nigeria, and Turkey. In analysing the Indonesian economy, economic and overall globalization cause FLP to decline, while social and political globalization increase FLP. With social globalization only, education and remittance inflows are positively related to FLP, while population growth reduces FLP. Economic growth increases FLP with all the measures of globalization, except with political globalization where economic growth reduces FLP. Also, the use of mobile phones reduces FLP with political and overall globalization, and increases FLP with economic globalization.

FLP declines with economic and political globalization, while it rises with social and overall globalization in Nigeria. Meanwhile, all components of globalization cause FLP to increase in

Turkey significantly, but the effect of overall globalization on FLP is positive and insignificant. Regardless of the measures of globalization, economic growth increases and reduces FLP in Nigeria and Turkey, respectively, while FLP falls with the use of mobile phones in both countries. Finally, remittance inflows reduce FLP with economic and political globalization, but increase FLP with political globalization in Nigeria. In Turkey, the effect of remittance inflows on FLP is negative but insignificant irrespective of the globalization measures.

Economic globalization has a negative effect on FLP, while social and overall globalization show a positive relationship with FLP in Brazil. Political globalization, education, remittance inflows, and population have no significant effect on FLP in the country. FLP reduces as economic growth and the use of mobile phones increase in Brazil when considering all the globalization measures, except for GDP that improves FLP when using social globalization as a measure of globalization. In Russia, economic and political globalization enhances FLP, while social and overall globalization reduces FLP. As expected, education and remittance inflows have a positive but insignificant impact on FLP in Russia regardless of the measure of globalization. The exception here is that the effect of remittance inflows is significant using overall globalization. Still on the Russian economy, economic growth and population growth spur FLP using economic and overall globalization, while economic growth only reduces FLP using social and political globalization. It is revealed that population growth has no significant effect on FLP when social globalization is used. With economic and overall globalization, the use of mobile phones reduces FLP, but it reduces FLP while employing political globalization.

While analysing the effect of globalization on FLP in India, the results reveal that all the measures of globalization, except social globalization (showing a positive coefficient value) negatively affect FLP. Just like Mexico, Nigeria, and Turkey, education and population growth show no significant relationship with FLP in India. Meanwhile, economic growth increases FLP using economic and overall globalization, while it dampens FLP using social and political globalization in India, China, and South Africa. Remittance inflows have a significant relationship with FLP while using social (positive effect) and political globalization (negative effect). Also, the use of mobile phones increases (with economic and overall globalization) and reduces (with political globalization) FLP in India. Among the BRICS countries, the estimates obtained for China are relatively stable with all the measures of globalization. Education,

remittance inflows, population, and the use of mobile phones are directly related to FLP. However, GDP produces different outcomes as seen under India's observation. Finally, all the globalization measures increase FLP in South Africa with political globalization having the highest magnitude. Education only shows a significant negative relation with FLP while using social globalization and with other measures of globalization, its effect is found to be insignificant. The effect of GDP on FLP in South Africa is similar to that of India and China. A non-significant association is observed between FLP and GDP in all the models. For population growth, FLP falls in all the models but significantly only for social and overall globalization in South Africa. FLP rises (with economic and overall globalization) and falls (with political globalization) as the use of mobile phones increases among the South Africans.

**Table 6: Globalization and Female Economic Participation in All Countries**

| Independent Variables | Dependent Variable: FLP | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | MG | | | | PMG | | | |
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| *LONG-RUN* | | | | | | | | |
| EGB(-1) | 11.11 | | | | | | | |
| SGB(-1) | | -0.19 | | | | -0.75** | | |
| PGB(-1) | | | -28.14 | | | | 0.13*** | |
| GBI(-1) | | | | 1.27* | | | | 0.25*** |
| PSE | -1812.06 | 4.24 | -157.30 | -65.41 | | 24.02** | 88.04*** | -8.51* |
| GDP | -2.91 | -0.61 | 7.19 | -0.38 | 1.46*** | 0.11*** | -0.08*** | |
| REM | 526.82 | -29.00* | -261.89 | 7.57 | | 0.99* | -6.83*** | -1.84*** |
| POP | 254.37 | -21.86 | -5.61 | 5.25 | -6.69*** | -0.84*** | -3.05*** | |
| MOB | 2.46 | 0.46 | 0.93 | -0.06 | - | | -0.03*** | -0.003 |
| *SHORT-RUN* | | | | | | | | |
| ECT | -1.14** | -0.88*** | -2.39* | -2.22** | -0.04 | -0.10* | -0.36* | -0.46** |
| Δ EGB(-1) | 0.32 | | | | -0.03 | | | |
| Δ SGB(-1) | | 0.09 | | | | 0.07 | | |
| Δ PGB(-1) | | | -1.86 | | | | 0.38 | |
| Δ GBI(-1) | | | | -2.53 | | | | 0.05 |
| Δ PSE | 0.33 | -12.56 | -27.78 | 3.81 | -6.59 | -0.61 | 5.43 | 1.64 |
| Δ GDP | 0.37** | 0.16 | -0.73 | 0.17 | 0.13 | 0.03 | -0.34 | 0.11 |
| Δ REM | -2.48 | -13.55 | -1.39 | 19.17 | 2.49 | -11.59 | -8.79 | 0.47 |
| Δ POP | -10.08 | 44.80 | 21.44 | -71.35 | -5.44 | -13.49** | -10.77 | -3.72 |
| Δ MOB | -0.03 | - | 0.05 | 0.04 | -0.01 | - | 0.002 | 0.01 |
| HM Test | 0.41 | 0.66 | 10.09 | 0.41 | 0.41 | 0.66 | 10.09 | 0.41 |
| | (0.99) | (0.99) | (0.12) | (0.99) | (0.99) | (0.99) | (0.12) | (0.99) |

Note: ***, **, and * denote 1%, 5%, and 10% levels of significance, respectively.
t-statistics are only reported.
FLP: Female labour force participation rate. GBI: Overall globalization. EGB: Economic globalization. SGB: Social globalization. PGB: Political globalization. PSE: Primary and secondary school enrolment. GDP : Gross domestic product growth rate. REM : Remittance inflows. POP: Population growth. MOB: Mobile cellular subscriptions.

**Table7: Globalization and Female Economic Participation in MINT Countries(Short-Run Estimates)**

| Independent Variables | Dependent Variable: FLP | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | **MEXICO** | | | | **INDONESIA** | | | |
| | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** |
| ECT | 0.002*** | -0.13*** | -0.18*** | -1.67*** | -0.08*** | -0.17*** | -1.78*** | -0.57*** |
| Δ EGB(-1) | 0.17*** | | | | -0.20*** | | | |
| Δ SGB(-1) | | 0.38*** | | | | 0.15*** | | |
| Δ PGB(-1) | | | -0.08*** | | | | 4.81*** | |
| Δ GBI(-1) | | | | -0.11*** | | | | -0.59*** |
| Δ PSE | -83.40 | -4.67 | -52.88 | 0.74 | -38.67 | -29.42 | 138.45*** | -12.25 |
| Δ GDP | -0.03*** | -0.08*** | 0.01*** | 0.004*** | 1.36*** | 1.15*** | -2.46*** | 0.82*** |
| Δ REM | 2.03** | 0.32 | 3.37*** | -0.07 | 2.02 | 2.64 | 13.89*** | 3.04 |
| Δ POP | -3.50 | -2.60 | -1.03 | 8.99 | 44.48 | -20.70 | -98.15*** | 18.54 |
| Δ MOB | 0.17*** | | 0.25*** | 0.17*** | 0.001*** | | -0.03*** | -0.01*** |
| | **NIGERIA** | | | | **TURKEY** | | | |
| ECT | -0.21*** | -0.16*** | 0.07*** | 0.14 | -0.002*** | 0.05*** | -0.01 | -0.02*** |
| Δ EGB(-1) | -0.48*** | | | | 0.03*** | | | |
| Δ SGB(-1) | | 0.15*** | | | | 0.04*** | | |
| Δ PGB(-1) | | | -2.50*** | | | | 0.02* | |
| Δ GBI(-1) | | | | 0.54 | | | | 0.05 |
| Δ PSE | 22.85 | -7.25 | -22.88 | -7.41 | -7.67 | 8.41 | 2.78 | -5.77 |
| Δ GDP | -0.34*** | -0.17*** | -0.28*** | -0.05** | 0.02*** | 0.07*** | 0.04*** | 0.03*** |
| Δ REM | -1.03*** | 0.61** | -0.56*** | 0.70 | -2.48 | -2.98 | -1.96 | -2.29 |
| Δ POP | -23.35 | -9.39 | 22.30 | -13.62 | 1.64 | 2.35 | 0.45 | 0.80 |
| Δ MOB | -0.20*** | | -0.04*** | -0.04*** | -0.07*** | | -0.07*** | -0.07*** |

Note: ***, **, and * denote 1%, 5%, and 10% levels of significance, respectively.

t-statistics are only reported.

FLP: Female labour force participation rate. GBI: Overall globalization. EGB: Economic globalization. SGB: Social globalization. PGB: Political globalization. PSE: Primary and secondary school enrolment. GDP : Gross domestic product growth rate. REM : Remittance inflows. POP: Population growth. MOB: Mobile cellular subscriptions.

**Table8: Globalization and Female Economic Participation in BRICS Countries (Short-Run Estimates)**

| Independent Variables | Dependent Variable: FLP | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Brazil** | | | | **Russia** | | | |
| | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** |
| ECT | -0.05*** | 0.12*** | -0.35*** | -0.57*** | -0.01*** | -0.03*** | -0.22*** | -0.96*** |
| Δ EGB(-1) | -0.15*** | | | | 0.003** | | | |
| Δ SGB(-1) | | 0.15** | | | | -0.09*** | | |
| Δ PGB(-1) | | | -0.26 | | | | 0.55*** | |
| Δ GBI(-1) | | | | 0.08** | | | | -0.05*** |
| Δ PSE | 4.84 | -5.71 | -8.78 | -2.43 | 33.58 | 36.53 | 34.78 | 25.56 |
| Δ GDP | -0.04*** | 0.04*** | -0.06*** | -0.02*** | 0.01*** | -0.03*** | -0.01*** | 0.04*** |
| Δ REM | -12.87 | 1.69 | -1.14 | -11.99 | 3.37 | 1.27 | 0.98 | 2.14*** |
| Δ POP | -84.06 | -32.10 | -8.49 | -58.33 | 3.66** | 1.06 | -1.86* | 8.12*** |
| Δ MOB | -0.08*** | | -0.07*** | -0.05*** | -0.02*** | | 0.004*** | -0.01*** |
| | **India** | | | | **China** | | | |
| ECT | -0.01*** | -0.44*** | -0.02*** | -0.07*** | -0.02*** | -0.003*** | -0.05*** | -0.05*** |
| Δ EGB(-1) | -0.05*** | | | | -0.02*** | | | |
| Δ SGB(-1) | | 0.05*** | | | | -0.19*** | | |
| Δ PGB(-1) | | | -0.42*** | | | | -0.01* | |
| Δ GBI(-1) | | | | -0.11*** | | | | 0.003*** |
| Δ PSE | 5.65 | -2.94 | 5.49 | 4.87 | 5.44 | 15.37 | 8.23 | 10.74 |
| Δ GDP | 0.02*** | -0.22*** | -0.03*** | 0.05*** | 0.02*** | -0.12*** | -0.01*** | 0.001*** |
| Δ REM | 0.01 | 0.69* | -0.20** | 0.12 | 0.33*** | 1.20*** | 1.69*** | 1.58*** |
| Δ POP | 22.42 | -45.56 | 14.44 | 17.71 | 5.09*** | 1.04** | 3.53** | 3.27*** |
| Δ MOB | 0.01*** | | -0.002*** | 0.02*** | 0.02*** | | 0.03*** | 0.03*** |
| | **South Africa** | | | | | | | |
| ECT | 0.02*** | -0.16*** | -0.67*** | -0.42*** | | | | |
| Δ EGB(-1) | 0.41*** | | | | | | | |
| Δ SGB(-1) | | 0.02* | | | | | | |
| Δ PGB(-1) | | | 1.36*** | | | | | |
| Δ GBI(-1) | | | | 0.66*** | | | | |
| Δ PSE | -1.96 | -15.77* | -56.51 | 0.72 | | | | |
| Δ GDP | 0.14*** | -0.39*** | -0.25*** | 0.15*** | | | | |
| Δ REM | 31.03 | -109.77 | -95.16 | 11.00 | | | | |
| Δ POP | -15.32 | -15.49** | -28.07 | -18.95* | | | | |
| Δ MOB | 0.04*** | | -0.05*** | 0.03*** | | | | |

Note: ***, **, and * denote 1%, 5%, and 10% levels of significance, respectively.

t-statistics are only reported.

FLP: Female labour force participation rate. GBI: Overall globalization. EGB: Economic globalization. SGB: Social globalization. PGB: Political globalization. PSE: Primary and secondary school enrolment. GDP : Gross domestic product growth rate. REM : Remittance inflows. POP: Population growth. MOB: Mobile cellular subscriptions.

*Source: Authors' Computation (2020)*

**5. Concluding implications and future research directions**

This study has examined how four different measures of globalization-economic, social, political and overall globalization-affect female economic participation (FEP) over the period 2004-2018 in a panel of MINT and BRICS countries. The Hausman test reveals that the PMG estimator is more efficient than the MG estimator. Thus, the PMG estimators from the panel ARDL indicate globalization has no significant impact on FEP in the short-run in the countries under consideration. This implies that globalization has no immediate effect on FEP as documented by Asongu *et al.* (2020). Meanwhile, political and overall globalization have positive long-run effects on FEP, while social globalization negatively influences FEP in MINT and BRICS countries. Economic globalization exerts no significant impact on FEP in both the short- and long-run. The positive effect of political and overall globalization implies that the creation of jobs through the number of treaties signed by these countries and the number of embassies in the said countries due to political globalization helps in increasing FEP, while the negative effect of social globalization reveals that most women use their mobile phones, a component of social globalization for social activities and not for economic activities.

Following these findings, the study recommends that in MINT and BRICS countries (i) economic globalization should be enhanced by reducing or removing trade barriers on goods and services, including tariffs and other restrictions to spur FEP, (ii) political and overall globalization should continually be improved by stressing peaceful cooperation and competition with other countries, and (iii) females should be encouraged to use their mobile phones, especially on economic and not social activities.

Having achieved the study's objective, this study has two directions for future studies: (i) they can decide to determine the effect of globalization on another measure of female labour force participation rate in MINT and BRICS countries, such as female employment rate, as employed by Asongu *et al.* (2020) and (ii) they can fill the same research gap as done by this study but in another group of economies such as ECOWAS, OECD and developed countries to see if globalization would differently affect female economic participation.

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