

IMPACT OF MATERNAL MORTALITY ON SUSTAINABLE DEVELOPMENT: EVIDENCE FROM MEXICO, INDONESIA, NIGERIA, AND TURKEY (MINT)

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Abstract

Over half a million women die every day due to some complications or problems during childbirth and according to WHO, 800 females die from child complications around the world daily. The recent Sustainable Development Goal (SDG) 3 Objective seeks to significantly cut the number of death of women to 70 per 100,000 live births by 2030. However, less than 9 years to the end of 2030, it is a pity that majority of women still die due to pregnancy despite claim by most government on huge health expenditure. The study investigated the impact of maternal mortality on sustainable development in MINT countries for the period of 2000-2020. The data were analyzed using second-generation econometric methods that include; cross sectional dependence, slope homogeneity, Westerlund cointegration, and Eberhardt and Teal AMG regression estimation techniques. Findings reveals that cross sectional dependence and slope heterogeneity exist among the MINT countries variables. Second, there is a long run relationship between maternal mortality and sustainable development. Third, maternal mortality impacted negatively and significantly on sustainable development. Therefore, policy towards reducing maternal mortality need to be put in place if the country must attain reduction in the rate of maternal mortality come 2030.

Keywords: Maternal mortality, Sustainable development, MINT countries, Slope homogeneity, cross sectional dependence.

JEL Classification: C14, J11, Q01.

1. Introduction

According to the World Health Organization (WHO) about 800 women die from pregnancy or childbirth-related complications around the world every day. About 295 000 of these women died during and following pregnancy and childbirth in 2017. Almost all these deaths occurred in low-resource settings, and most could have been prevented. Understanding the danger of maternal mortality to any economy, the United Nation in 2015 included it as one of its Sustainable Development Goal (SDG) target. Goal 3, target 3.1 calls for the reduction of the global maternal mortality ratio to less than 70 per 100,000 live births by 2030.

The World Health Organization defines maternal mortality as the death of a woman during or within 42 days of pregnancy due to pregnancy-related causes, represented as a ratio per 100,000 live births in the population being examined (World Health Organization, 2004). This includes all deaths irrespective of the duration of the pregnancy and from any cause related to the pregnancy, childbirth, or conditions aggravated by pregnancy, including deaths associated with the management of pregnancy but excludes the death of pregnant women due to accident or incidental events (Abdollahpour, et al, 2022; Canty, 2022; Chama, Etuk, & Oladapo, 2020; WHO, 2019).

Today, women are dying as a result of difficulties during and after pregnancy and childbirth. The majority of these issues arise during pregnancy and are either preventable or treatable (Karkee, et al. 2022). According to (Meh, et al, 2022; WHO, 2019), over 70% of serious difficulties are caused by severe bleeding after birth, infections, high blood pressure throughout pregnancy, delivery complications, and sometimes botched abortion. Other issues may exist before to pregnancy, but they worsen throughout pregnancy, especially if they are not addressed as part of the woman's treatment.

MINT is an acronym for Mexico, Indonesia, Nigeria, and Turkey. The term was coined in 2014 by Fidelity investment as countries that has potential for future growth based on their geographic, demographic, and economic factor. According to the UNICEF report, among these countries, Nigeria reported about 2.4 percent of the population in the world. Its contribution to the global deaths of women is 10% with latest figure in 2021 stand as 576 per 100,000 live births. Indonesia recorded 305 per 100, 000 maternal deaths. Mexico reported 211 maternal deaths per 100, 000 live births while only Turkey have the least with 17 per 100,000 live births (UNICEF, 2022). Except for Turkey, these figures fall above the SDGs target of 70 per 100,000 live births. Despite efforts to reduce maternal deaths, such as increasing access to emergency obstetric care; improving women's access to safe abortion services; reducing unmet family planning needs; improving human resources,

both through transforming medical education and instituting a midwifery model of care; improving quality of care; and continuing to report and analyze causes of maternal deaths, it is disheartening that most MINT countries have not been able to achieve their goals.

The contribution of this paper is as follows: first, the application of the second generation econometric techniques (Common Correlated Estimated Mean Group (CCEMG)) that allows for cross section dependence, time variant unobservable with heterogenous impact across panel countries and solves the problem of identification and Eberhardt and Teal (2010) Augmented Mean Group (AMG) that are more nuanced and can handle both slope heterogeneity and cross-section) to solving issues related to panel data. Second, the application of Westerlund Cointegration Test to test the existence of a long-term relationship and, finally, this paper is the first to investigate the effect of maternal mortality on sustainable development using the MINT countries.

The paper is structured as follows. The first section is the introduction, which gives the breakdown of the background and problem of the study. Section two is devoted to the materials and methods used in advancing this study while section three discusses the results of the study. Conclusion and suggested recommendations are offered in section four.

2. Materials and Methods

Data Source and Requirements

The sample of study used are the four MINT countries comprising Mexico, Indonesia, Nigeria and Turkey. The data used are sustainable development measured by adjusted net savings (see Farida, Arifin and Abdol, 2015, Koirala and Pradhan, 2020), maternal mortality rate, consumer price index, per capita GDP, financial development, and natural resources rent. Except for financial development, all data were retrieved from the World Development Indicators (<http://data.worldbank.org>). Data for financial development were sourced from (<http://data.worldbank.org/financial-development-fd>). The data span from 2000 to 2020.

Model Specification

Given our desire to investigate the effect of maternal mortality on sustainable development in MINT countries, this study adopts the model by Ibikunle (2019). The functional form of the model with a light modification is stated as follows:

$$SD = f(MM, PKY, CPI, FD, NR) \quad (1)$$

Where SD = Sustainable development measured by adjusted net saving. MM = Maternal mortality rate, PKY = Per capita income, CPI = Consumer price index, FD = Financial development and NR = Natural resources rent. Although, the paper seeks to investigate the effect of maternal mortality on sustainable development, however, per capita income, consumer price index, financial development and natural resource rent are added as control variables that determined sustainable development as supported by Koirala and Pradhan. (2019).

Equation 1 is respecified in its logged form as

$$\log SD_{it} = \beta_0 + \beta_1 MM_{it} + \beta_2 \log PKY_{it} + \beta_3 \log CPI_{it} + \beta_4 \log FD_{it} + \beta_5 \log NR_{it} + \varepsilon_{it} \quad (2)$$

Where β_0 = constant term, β_k ($k = 1, 2, 3, 4, 5$) = coefficients on independent variables, ε_{it} = error term. On apriori $\beta_1 < 0, \beta_2 > 0, \beta_3 < 0, \beta_4 > 0$ and $\beta_5 > 0$.

Estimation Techniques

Traditional econometric techniques ignore the existence of cross-sectional dependency and slope heterogeneity. Thus, when both occur, the first-generation econometric methods may not provide a good result (Grossman & Krueger, 1995; Pesaran, 2004). Therefore, to free from any bias, the cross-sectional dependence test was first conducted. Four different cross-sectional tests was employed that include the Breusch-Pagan LM test (1980), Pesaran CD test, Pesaran Scaled LM test (2008) as well as the Bias corrected LM scale test. For all these tests, the null hypothesis of no cross-sectional dependence is tested against the alternative hypothesis. The specification of the test statistics for the four tests are given as follows:

$$\text{Breusch-Pagan (1980) LM} = \sum_{i=1}^{N-1} \sum_{j=i+1}^N T_{ij} \widehat{cor}_{ij}^2 \rightarrow \chi^2 \frac{N(N-1)}{2} \quad (3)$$

Where $\widehat{cor}_{ij}^2$ is the correlation coefficient of the residuals extracted from the equation.

$$\text{Pesaran (2004) } LM_s = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^N (T_{ij} \widehat{cor}_{ij}^2 - 1) \rightarrow N(0,1) \quad (4)$$

$$\text{Pesaran (2008) } LM_{BC} = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^N (T_{ij} \widehat{cor}_{ij}^2 - 1) - \frac{N}{2(T-1)} \rightarrow N(0,1) \quad (5)$$

$$\text{Pesaran (2004) } CD_p = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^N T_{ij} \widehat{cor}_{ij} \rightarrow N(0,1) \quad (6)$$

In line with the four tests for cross – section dependence, the null hypothesis that there is cross-sectional independence is stated as follows:

$$H_0: \hat{\rho}_{ij} = cor(\mu_{it}, \mu_{jt}) = 0 \text{ for } i \neq j \quad (7)$$

Slope Homogeneity Test

Another important issue for this study is the heterogeneity of the slope (cross-country). The evidence that major economic shocks discovered in country 'A', for instance, are not necessarily imitated in country 'B' is the presence of heterogeneity of slopes in a series. For this study, the Pesaran and Yamagata (2008) delta test for the presence or absence of slope heterogeneity is employed. The slope homogeneity equation is given as.

$$\hat{S}_w = \sum_{i=1}^N (\hat{\beta}_i - \hat{\alpha}_{WFEP})' X_i' \frac{M_{TX_i}}{\delta_i^2} (\hat{\beta}_i - \hat{\alpha}_{WFEP}) \quad (8)$$

Where $\hat{\beta}_i$ is the estimator for pooled OLS, $\hat{\alpha}_{WFEP}$ is the estimator for pooled weighted fixed effect and the estimator is δ_i^2 . The standard dispersion statistics of the equation are specified in equations 9 and 10 below:

$$\hat{\Delta} = N^{\frac{1}{2}} = \left(\frac{N^{-1} \hat{S}_w - k}{2k} \right) \quad (9)$$

The standard dispersion statistics of the bias adjusted version of equation can be computed as:

$$\hat{\Delta}_{adj} = N^{\frac{1}{2}} \left(\frac{N^{-1} \hat{S}_w - E(Z_{it})}{\sqrt{var(Z_{it})}} \right) \quad (10)$$

Test for Panel Unit Root

Due to the presence of cross sectional dependence and slope heterogeneity in the data series, first generation unit root tests are no longer sufficient because they are not robust to these challenges. Hence, the Cross-sectionally Augmented Dickey-Fuller (CADF) unit root test that is capable of handling cross-sectional dependence and slope heterogeneity is employed. According to Pesaran (2008), the CADF statistic is calculated thus:

$$\Delta y_{it} = \alpha_i + b_i y_{i,t-1} + c_i \bar{y}_{t-1} + d_i \Delta \bar{y}_t + e_{it} \quad (11)$$

Where: $\bar{y}$ and $\Delta \bar{y}$ are the mean of cross-sections of lagged levels and the first differences at time t for the countries under review. Accordingly, Pesaran (2007) gives the CADF as:

$$CADF_t = t_i(N, T) = \frac{\Delta y_i' \bar{M}_{wy_{i-1}}}{\hat{\sigma}_i (y_{i-1}' \bar{M}_{wy_{i-1}})^{\frac{1}{2}}} \quad (12)$$

The CIPS statistic is computed from the estimated t-statistic from equation (12) as shown below:

$$CIPS = \frac{1}{N} \sum_{i=1}^N CADF_i \quad (13)$$

Westerlund Cointegration Test

Likewise, the first-generation panel unit root studies, the traditional panel cointegration estimator such as the residual-based cointegration technique Pedroni (1999) does not consider the cross-sectional dependence inside the panels. Therefore, the Westerlund (2007) panel cointegration study, which is robust to handle cross-sectionally dependent panel data collection, is used to investigate the long-term correlations between variables. Cross-sectional dependency is compensated for by using bootstrapping methods to estimate the probability values of the test statistics. Under the null hypothesis of no cointegration, a total of two group-mean tests and two panel tests are carried out against the alternative hypothesis of cointegration with at least one cross-sectional unit or cointegration within the entire panel, respectively. The Westerlund tests (2007) are formulated in the sense of a model for error correction that can be represented as:

$$\Delta y_{it} = \delta'_i d_t + \alpha_i (y_{i,t-1} - \beta'_i x_{i,t-1}) + \sum_{j=1}^{p_i} \alpha_{ij} \Delta y_{i,t-j} + \sum_{q=1}^{q_i} \gamma_{iq} \Delta x_{i,t-q} + \varepsilon_{it} \quad (14)$$

where d_t stands for the deterministic components and p_i and q_i are the lag lengths and lead orders

which vary across individual cross-sections. The two group-mean test statistics G_{τ} and G_{α} and the two-panel test statistics P_{τ} and P_{α} within the Westerlund (2007) cointegration analysis can be shown as:

$$G_{\tau} = \frac{1}{N} \sum_{i=1}^N \frac{\hat{\alpha}_i}{SE(\hat{\alpha}_i)} \quad (15)$$

and

$$G_{\alpha} = \frac{1}{N} \sum_{i=1}^N \frac{T \hat{\alpha}_i}{\hat{\alpha}_{i(1)}} \quad (16)$$

In which $\hat{\alpha}_i$ = error correction estimate, and $SE(\hat{\alpha}_i)$ = standard error of $\hat{\alpha}_i$.

The panel statistics are constructed as:

$$P_{\tau} = \frac{\bar{\alpha}}{SE(\bar{\alpha})} \quad (17)$$

and

$$P_{\alpha} = T \bar{\alpha}$$

3 Results and Discussion

Table 1 provides a summary of the descriptive analysis of variables to see the structure and composition of data used for this study. Nigeria has the highest of the mean value for Sustainable development measured by Adjusted Net Savings with \$10.91 million for the period 2000-2020, followed by Turkey \$10.01 million while Mexico has the lowest \$7.071 million. Also, the maximum value was recorded in Nigeria \$31.931 while the minimum value was recorded in Indonesia (-3.832) million dollars. Nigeria reported the highest mean values for maternal deaths with 1019.15 and the highest maximum value with 1200 while the minimum was reported in Turkey. In terms of inflation rate, the highest mean value was reported in Nigeria with 112.32 followed by Turkey 105.494 while Indonesia reported the lowest inflation rate value with 97.909 and the maximum value was recorded in Nigeria with 267.512 and Turkey recording the minimum with 20.595. as reported, Mexico has the highest mean value for per capita income followed by Turkey then Indonesia and Nigeria with \$8992.85 million, \$8845.68 million, \$2571.04 million, and \$1877.21 million respectively. Turkey recorded the maximum value for per capita income with \$12614.78 million while the minimum value was reported in Nigeria with \$567.93 million. Nigeria has the highest mean value in natural resources (11.699) while the minimum value falls in Turkey (0.034) and the maximum value as well falls in Nigeria with value (20.64)

Table 1: Descriptive Statistics of Variables

Country/Variable	Mean	Standard Error	Minimum	Maximum
Adjusted Net Savings				
Mexico	7.071	1.3	3.339	9.32
Indonesia	7.413	6.624	-3.832	15.333
Nigeria	10.91	8.902	1.163	31.931
Turkey	10.07	3.098	4.695	15.689
Panel	8.867	5.925	-3.832	31.931
Maternal Mortality				
Mexico	45.1	8.896	31	56
Indonesia	225.15	35.211	163	272
Nigeria	1019.15	103.312	901	1200
Turkey	26.55	8.792	15	42
Panel	328.988	412.044	15	1200
Consumer Price Index				
Mexico	99.009	23.738	63.312	141.15

Indonesia	97.499	34.532	44.016	151.177
Nigeria	112.321	70.512	29.601	267.512
Turkey	105.494	56.834	20.595	234.437
Panel	103.581	49.294	20.595	267.512
Per Capita Income				
Mexico	8992.85	1195.23	102.37	1928.92
Indonesia	2571.04	1240.25	748.26	4135.20
Nigeria	1877.21	775.31	567.93	3099.99
Turkey	8845.68	2898.83	3142.92	12614.78
Panel	5571.69	3780.14	567.93	12614.78
Natural Resources				
Mexico	3.585	1.5	1.19	5.798
Indonesia	2.939	1.662	0.639	6.466
Nigeria	11.699	4.952	2.8	20.64
Turkey	0.088	0.023	0.034	0.124
Panel	4.578	5.097	0.034	20.64

Preliminary Analysis

Cross – Section and Slope Homogeneity

Table 2 and Table 3 presents the cross sectional and slope homogeneity results. As reported in Table 2, the four tests' statistics were statistically significant. Hence, the null hypothesis of no cross-sectional dependence is rejected. This means that shock to a variable in any one of the MINT countries has implication on another country's variable. Similarly, in Table 3, the slope homogeneity test was conducted using the delta tests. The reported tests statistics were statistically significant for both tests. Thus, the existence of slope homogeneity among the variables used in the country and guarantee the condition of the second-generation econometric techniques.

Table 2: Cross Sectional Dependence Test

Tests	ANS	MM	CPI	PCY	FD	NR
Breusch-Pagan LM	21.751 (0.00)	95.988 (0.00)	105.357 (0.00)	105.584 (0.00)	20.458 (-0.00)	58.676 (0.00)
Pesaran Scaled LM	3.392 (0.00)	24.823 (0.00)	27.593 (0.00)	27.593 (0.00)	3.019 (0.00)	14.051 (0.00)
Bias-Corrected ScaledLM	3.275 (0.00)	24.705 (0.00)	27.41 (0.00)	27.475 (0.00)	2.901 (0.00)	13.934 (0.00)
Pesaran CD	3.192 (0.00)	9.7789 (0.00)	10.264 (0.00)	10.275 (0.00)	-1.504 (0.133)	7.555 (0.00)

Table 3: Slope homogeneity tests results

Delta Tests	Test Stat. and Prob.					
	ANS	MM	CPI	PCY	FD	NR
Delta tilde	4.123* (0.00)	4.143* (0.00)	6.1031* (0.00)	3.014** (0.04)	6.727* (0.00)	5.879* (0.00)
Delta tilde adj.	5.234* (0.00)	2.111 (0.03)	2.285 (0.01)	.893 (0.10)	7.152 (0.00)	4.903* (0.00)

Source: Author, 2022. Note *, ** represent significance at 1% and 5% respectively

Panel Unit root test results

Table 4 and Table 5 presents the CADF and CIPS panel unit root test results with intercept and trend at levels for all the variables used. As reported in Table 4, the CADF and CIPS results with intercept and trend were not all stationary at levels. However, in Table 5, the CIPS estimates showed that on average, all the variables are stationary after first difference. Therefore, the existence of cross-sectional dependence and evidence of stationarity among the variables call for the use of the second-generation econometric techniques.

Table 4. Panel unit root test with intercept at levels

Countries	Test Statistics						Critical Values		
	ANS	MM	CPI	PCY	NR	FD	1%	5%	10%
Mexico	2.27	-1.60*	2.68	-2.94	-3.72	-0.45	-4.97	-4.01	-3.65
Indonesia	2.22	-3.34	1.77	-2.68	-0.81	-1.94	-4.97	-4.01	-3.65
Nigeria	2.84	-2.47	0.95	-1.90	-0.14	-2.37	-4.97	-4.01	-3.65
Turkey	3.17	-3.22	1.61	-1.01	4.48*	-2.40	-4.97	-4.01	-3.65
CIPS Stat for all countries (Panel)	2.07	2.57*	1.75	2.89*	-1.01	-1.99	-2.98	-2.75	-2.63

Note: * denotes significant at 1%.

Table 5 Panel unit root test with intercept and trend after first difference

Countries	Test Statistics						Critical Values		
	ANS	MM	CPI	PCY	NR	FD	1%	5%	10%
Mexico	-1.14	-2.78	-3.07	-1.07	2.66	-2.38	-4.97	-4.01	-3.65
Indonesia	-2.98	-2.93	-3.26	-3.03	0.00	-2.02	-4.97	-4.01	-3.65
Nigeria	-2.35	-2.83	-2.84	-2.70	-3.18	-2.23	-4.97	-4.01	-3.65
Turkey	-4.59	-4.54	-1.06	-3.09	-3.20	-3.18	-4.97	-4.01	-3.65
CIPS Stat for all countries (Panel)	3.51*	4.84*	3.17*	3.62*	3.01*	3.10*	-2.98	-2.75	-2.63

Note: * denotes significant at 1%.

Westerlund cointegration test result

Another important objective of the paper was to determine the existence of long run relationship among the variable. Since the variables exhibits a cross sectional dependence and slope homogeneity, the second generation cointegration test propose by Westerlund (2007) was employed and the result is reported in Table 6. Based on the outcome, the four cointegration result tests reject the null hypothesis of no long run relationship between sustainable development and maternal mortality. This is achieved from the value from P_{τ} and P_{α} test statistics. The rejection of the null hypothesis was at the 5% significant level. Hence, the result indicates that there is a long run relationship between sustainable development and maternal mortality, consumer price index, Per-capita income, natural resource rent and financial development in the MINT countries. The evidence of a long run relationship between maternal mortality and sustainable development indicate that maternal mortality has implication on the attainment of sustainable development come 2030.

Table 6. Westerlund cointegration test

Statistics	Value	Asymptotic p -value	Bootstrap p -value
g -tau	1.632	0.988**	0.037
g -alpha	2.453	0.840***	0.00
ρ -tau	3.329	0.7651**	0.034
ρ -alpha	4.258	0.988**	0.029

Note: *** and ** denotes significance at 1% and 5% respectively

Regression Result

After confirming the presence of cross-sectional dependence and slope homogeneity in the result. Empirical literature have proven that the first generation econometric techniques can no longer be efficient in analyzing panel data with such existence. Hence, Pesaran (2006) Common Correlated Estimated-Mean Group (CCEMG)) that allows for cross section dependence, time variant unobservable with heterogenous impact across panel countries and solves the problem of identification and Eberhardt and Teal (2010) Augmented Mean Group (AMG) that are more nuanced and can handle both slope heterogeneity and cross-section dependence are employed in the study. The results for both the individual specific and group specific are presented in Table 7 and Table 8.

From the result, the regression result shows that maternal mortality impacted negatively on sustainable development in the MINT countries. From the result, 1 percent rise in the death of women will reduce sustainable development between 0.254% to 0.632%. The result was significant as regard individual specific. As regard group specific, the effect of maternal mortality on sustainable development was negative for all the MINT countries and was also significant in determining sustainable development for all the countries. As reported, the result was significant at 1 percent for Nigeria, Indonesia, and Turkey with $p < 0.01$ while at 5 percent for Mexico with $p < 0.05$. However, looking at severity of the effect, Nigeria has the highest negative effect on sustainable development with 0.672% followed by Indonesia 0.458%, then Mexico with 0.190% and then Turkey having the least impact with 0.125%. The result was not surprising with Nigeria having a low health expenditure over the years with a growing population in the country. Also, maternal mortality rate in the country is higher than all other countries. This result confirmed the outcome of Ibikunle (2019) on the impact of maternal mortality on sustainable development in West Africa who also concluded that increase in the death of women during or after 42 days of delivery will dampen sustainable development in West Africa come 2030.

Similarly, as regard inflation, represented by the consumer price index. Findings revealed that 1 percentage point increase in the rate of inflation will reduce sustainable development between (0.168% - 0.03%) respectively. In country wise, inflation impacted negatively on sustainable development for all the four countries. Result revealed that 1 percentage point increase in inflation will dampens sustainable development by 0.25% for Mexico, 0.192% for Indonesia, 0.096% for Turkey and 0.326% for Nigeria. The severity of inflation therefore will be more for Nigeria, followed by Mexico, Indonesia and then Turkey. In terms of significant, aside from Nigeria, inflation was significant in determining sustainable development in the other three countries. Koirala and Pradham (2019) study on the determinant of sustainable development in 12 Asian countries supported this finding.

It is evident from the per capita income result that for both AMG and CCEMG, per capita income will boost sustainable development in the MINT countries. Holding all other factors constant, the result shows that a percentage increase in per Capita income will increase sustainable development by 0.459%-0.488% on average.

ceteris paribus. The result is in line with findings by (Qasim & Crimes 2018) Larissa et al, 2020, Koirala & Fraldham, 2018). In relation to the strength of impact, based on country wise result, a percentage increase in per capita income will raise sustainable development by 0.418%, 0.599%, 0.577% and 0.361% respectively by Mexico, Indonesia, Nigeria, and Turkey. Indonesia will benefit the most with a higher percentage increase in sustainable development followed by Nigeria, Mexico and Turkey being the least with 0.361%.

Another important control variable in this study is the natural resource rent which is an important aspect of sustainability. The total natural resource rent measured as percentage of GDP was also significant in explaining (sustainable development) in the MINT countries. The result shows an inverse relationship between total natural resource and sustainable development. As reported, for every 1% change in the total natural resource rent, sustainable development will decrease between 0.373% - 0.155% on an average. It is observed from group specific result that the effect of total natural resource rent on sustainable development differs among the MINT countries. For countries like Indonesia and Nigeria, the effect was positive on sustainable development with a percentage increase in natural resource rent increasing sustainable development by 0.207% and 0.735% for Indonesia and Nigeria respectively. The positive effect is in line with study by Pardi, Salleh and Nawi (2015). However, for Mexico and Turkey, natural resource rent impacted negatively on sustainable development with a percentage increase in natural rent reducing sustainable development by 0.317% and 0.004% negatively for Mexico and Turkey. Similarly, the effect was only significant in Mexico but not significant with Turkey with $p > 0.1$.

A significant and positive result exist between financial development and sustainable development in the MINT countries. Looking at the coefficient, a percentage increase in financial development will raise sustainable development between 0.407%-0.835% averagely, ceteris paribus. The result was also significant, which shows that financial development stands as an important factor that determine sustainable development in MINT countries. As regard financial development, in terms of individual specific, it was discovered that financial development has a high significant effect on sustainable development for Mexico and Turkey respectively. A percentage increase in financial development will increase sustainable development by 0.906%, 0.341%, 0.612% and 0.605% respectively for Mexico, Indonesia, Nigeria and Turkey. The findings show clearly that Nigeria has the least strength of impact with 0.162% while Mexico has the highest effect on sustainable development with 0.906%. In terms of significance, FD was insignificant in predicting sustainable development in Nigeria and Indonesia while it stands as important determinants for Mexico and Turkey. The findings are in line with (Din, Khan Khan & Nilofar (2021) study on nexus between sustainable development, adjusted net savings and economic growth and financial development in South Asia.

Table 7. Regression Result. Dependent Variable: Log ANS

	AMG Estimate			CCEMG Estimate		
	Coefficient	z	p(z)	Coefficient	z	p(z)
Log MMI	-0.632**	-2.140	0.012	-0.254*	2.080	0.061
Log CPI	-0.168*	-1.850	0.050	-0.031*	-1.550	0.083
Log PCI	0.488**	2.280	0.010	0.411	-	0.000
log NR	-0.155	-0.700	-0.030	-0.373	-1.430	0.120
Log FD	0.407**	2.880	0.031	0.835**	2.030	0.043

Note: ***, ** and * denotes significance at 1%, 5% and 10% respectively.

Table 8: Country specific Regression Result

COUNTRIES	VARIABLES				
	MMI	CPI	PCY	NR	FD
Mexico	-0.190** (0.047)	-0.251 (0.193)	0.418* (0.003)	-0.317** (0.011)	0.906 (0.506)
Indonesia	-0.458*** (0.085)	-0.192 (0.573)	0.599* (0.00)	0.207 (0.547)	0.314 (0.911)
Nigeria	-0.672* (0.008)	-0.326 (0.283)	0.577* (0.002)	0.735** (0.011)	0.162 (0.188)
Turkey	-0.125 (0.002)*	-0.096* (0.000)	0.361* (0.000)	-0.040 (0.965)	0.605 (0.018)**

Note: ***, ** and * denotes significant at 1%, 5% and 10% respectively.

4 Conclusion and Policy Recommendations

This study examined the effect of maternal mortality on sustainable development using Mexico, Indonesia, Nigeria, and Turkey. Second generation econometrics techniques were employed. The findings are as follows: First, cross sectional dependence occur among the selected variables in the selected countries. Second, long run link was established between maternal mortality and sustainable development. Third, maternal mortality stand as a barrier to sustainable development in the MINT countries and the effect is more severe in Nigeria. The study justifies that continuous rise in maternal death may reduces the chances of MINT countries attaining sustainable development come 2030. Consequently, the study recommended as follows: first there is a need for increasing access to emergency obstetric care; improving women's access to abortion; reducing unmet need in family planning; improving human resources, both through transforming medical education and by instituting a midwifery model of care. In addition, price of health care for pregnant women should be minimal or free.

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