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Engendering Macroeconomic Policy for Gender Equality in Sub-Saharan Africa

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Abstract

The social movement is inspiring meaningful conversation about the discriminatory practices that Africa women have long faced in every aspect of their lives. However, despite considerable improvement in the gender balance discourse, the worst cases of gender imbalances are still recorded in sub-Saharan Africa (SSA). Macroeconomic volatility, both as a source and a reflection of underdevelopment, is a fundamental concern for women in SSA. This paper lends empirical credence to the role of macroeconomic policies (fiscal and monetary policies indices) in gender equality in SSA from 1993 through 2017. We gathered panel data on the indices of macroeconomic policies and gender inequality in all 48 SSA countries. We employed the dynamic panel system generalized method of moment estimation procedure (dynamic system GMM) to establish a baseline-level relationship between the variables of interest. We adjusted for heterogeneity assumptions inherent in ordinary panel estimation and found a basis for a strict orthogonal relationship among the variables. Our results suggest fluctuations in macroeconomic policies as a lead factor for gender equality in SSA countries. Efforts should be tailored toward balanced macroeconomic policies that can guarantee sustainable gender equality approaches to collective prosperity.

Key words

Macroeconomic policy, gender equality, dynamic GMM, Sub-Saharan Africa
JEL Codes: C33, E61, I18, J16

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Introduction

Deeply-rooted structural obstacles such as uneven resources allocations, male-dominated power struggles, and few wealth creation opportunities for women, fueled by obsolete and archaic social institutions and cultural orientations that favor discrimination seem the most significant impediments to an egalitarian or equal Africa. Despite the considerable successes recorded in the gender equality discourse, some through closing the gender gap in education enrolment, African women have still only achieved only 47 per cent of the human development outcomes of their male counterparts (San Vicente Portes, Atal, & Juárez-Torres, 2019). This is driven partly by lower levels of female secondary educational attainment, lower female labor force participation, and high maternal mortality rates (Adjiwanou & LeGrand, 2014; Baliamoune-Lutz, 2007; Baliamoune-Lutz & McGillivray, 2015). Anticipated and improved revenue from increase female participation is negated or lost through economic marginalization as daily efforts are either underpaid or undervalued, and are mostly in the informal sector (Auspurg, Hinz, & Sauer, 2017). African women account for 66 per cent of jobs in the non-informal sector, thus earning less compared to their male counterparts (Aterido, Beck, & Iacovone, 2013; Rendall, 2013). The fact that only between 7 and 30 per cent of private firms have a female manager is disgraceful (Kabeer, 2005).

All these gender biases are especially highly pronounced in Sub-Saharan Africa (SSA), characterized by age-long traditions and obsolete cultural orientations that today are a clear and well-known impediment to the development of African women (Aterido et al., 2013; Ogede, Adekunle, & Adegboyega, 2020). These traditions and approach to women's roles in society have far-reaching implications for women's education, particularly as regards the length of time women are allowed to study, their ability to seek paid jobs, and their access to financial and economic benefits (Abebe & Jepkiyeny, 2016). It is shocking to know that rural African women still engage in about 71 per cent of water collection, estimated to translate to about 40 billion hours a year (Quisumbing & Pandolfelli, 2010). They are equally less likely to have bank accounts and, most importantly, access to credit (Clark & Bower, 2016; Mayoux, 1999; Somolu, 2007). In key findings, estimated annual economic losses arising from gender inequality in Africa have averaged US$95 billion per year since 2010 and could be as high as US$105 billion, or 6 per cent of the region's GDP in 2022 (Cuberes & Teignier, 2012; Ferrant, Pesando, & Nowacka, 2014; Wekwete, 2014).

These obsolete approaches to female participation have structural and severe economic consequences that need to be checked if we are serious about developing the much-proclaimed potentials of the African girl child and the realization of the Africa 2063 agenda (*the Africa we want*). The importance of achieving the gender equality objectives in line with Goal Five of the UN's Sustainable Development Agenda has heightened the discourse on this subject (United Nations, 2018). Governments, international organizations, donors, investment partners, female representative organizations, and society at large are demanding an egalitarian society free from gender imbalances in all areas of life. Evidence-based policy documents that offer new and insightful empirical backing for gender policy re-assessment, formulation, and research is, therefore, most urgently needed. This study aims to address this need.

Despite the overwhelming consensus that macroeconomic policies are gender-neutral, the consequences and benefits of government's economic policy options have heterogeneous, and unbalanced effect on men and women viewed from the perspectives of market (e.g., paid labor) and non-market (e.g., unpaid care work) orientation strategies (Elson & Cagatay, 2000). In other climes, government budgetary constraints could propel a wave of austerity measures that impede social spending, which ultimately leads to greater unpaid care work by women by default. Trade liberalization could also induce female over-representation in import-dependent sectors, like agriculture and food production (Berik, van der Meulen Rodgers, & Seguino, 2009). Despite these facts, policy mechanisms have, for a long time ignored the growing menace of gender disparity, leading to ambiguity in the role of macroeconomic indices for gender mainstreaming in regions like SSA. It is not even entirely clear how macroeconomic policies could lead to the realization of gender equality in SSA.

In this study, an attempt is made to provide experimental proof of the macroeconomic policy-gender imbalances in SSA to reach conclusions capable of influencing contemporary gender policies and research. Assessing the quantitative relevance of macroeconomic policies for gender equality will go a long way toward addressing the seemingly almost impossible objective of successfully addressing gender imbalances in SSA. With particular reference to SSA, this study attempts to unravel the underlying structural relationship between macroeconomic policies and gender equality so as to inform policy directions on the subject. Focusing on goals, measurements, and policy instruments, an empirical examination of the macroeconomic policy-gender relationship can provide the building blocks for an alternative macroeconomic agenda that is rights-based and gender-responsive.

There is a greater need to harness the coordinating power of macroeconomic policy instruments to achieve gender balance in SSA for a number of reasons. The prevalence of under-age marriage and sexual and physical violence, as well as the high maternal mortality rate in SSA, jeopardize women's health (Sarich, Olivier, & Bales, 2016). A concerted effort to end gender imbalances in SSA will require comprehensive governmental and societal ordinances, to ensure the provision of women's social wellbeing and economic opportunities for more productive lives (Power, Boughen, & Ames, 2019; Adekunle, Williams, Omokanmi, & Onayemi, 2020). It is important to note that gender equality is an offshoot of the Sustainable Development Agenda 2030 and Africa's Agenda 2063, therefore, narrowing the gender imbalance gap will ensure SSA and Africa at large are positioned for double-digit economic growth and quick realization of these development objectives.

The novelty of this paper is threefold: (1) This paper informs policy direction on gender mainstreaming, and gender inequality arising from the interaction of macroeconomic policies, (2) it reveals the quantitative relevance of macroeconomic policy in addressing gender inequality in SSA and why gender inequality should not be relegated to the background in the face of contrasting development objectives, (3) it argues that the unintended gender consequences in SSA of policy formulation and development are by-products of the gender mainstreaming debacle, and points to an alternative policy agenda that could be encouraged to optimize economic gains in association with gender equality. Having introduced the study, the rest of the paper is organized as follows. A literature review examines the theoretical underpinning and empirical evidence on this issue in chronological order to show the historical progression of this subject, while the third section discusses the data used, and the methodology pursued to study the link between macroeconomic policies and gender equality in SSA. Following a presentation of the empirical results and a discussion of the findings, the paper presents its conclusions.

Literature Review

The consequences of macroeconomic policy for gender equality in SSA remain dimly discerned and need to be studied to illuminate important structural relations in the policy-gender mainstreaming literature. No cross-country or country-specific studies have examined this phenomenon in SSA. The paucity of research in a core area indispensable to the socio-economic welfare of the African nation, particularly SSA, informs the need for this study. In the findings of Stotsky (2006),

who examined the implications for macroeconomic policy of gender differences in economic behavior, the author found that gender equality leads to greater and sustainable growth outcomes. The findings of Potrafke and Ursprung (2012), who assessed the influence of globalization on social institutions that govern female subjugation and gender equality in 208 developing countries in four different regions (Africa, Asia, Eastern Europe, and South America), revealed that economic and social globalization exerts a positive influence on the social institutions that reduce female subjugation and promote gender equality.

In their study, Wyndow, Li, and Mattes (2013) investigated the causal effects of female empowerment on democratic development for 97 sovereign countries from 1980 to 2005 using a dynamic panel model with system-generalized method of moments. The results revealed that improvements in female empowerment were associated with democratic development over this period, with female education and female labor force participation having a significant positive and causal effect on these movements. The authors also found that growth in female education was associated with the growth of democracy in those nations where the girl children were educated, leading to substantive economic growth and development. Wekwete (2014), in her examination of gender inequalities between men and women in Africa, identified gender gaps in economic opportunities as being inversely related to growth. The underlying determinants of variations in the female emancipation and growth outcomes can be associated with the different responsibilities for care and housework between women and men, which consequently lead to different time use, thus affecting choices in employment and economic activity; the inequity between women and men in terms of access to productive inputs and agricultural extension services; the differential treatment by markets; and the support of these constraints which can generate an uneven employment opportunities between men and women. For Branisa, Klasen, and Ziegler (2013), who examined the effect of social institutions related to gender inequality on development outcomes in developing countries using macro data at the country level, social institutions related to gender inequality are associated with female education, child mortality, fertility, and governance (corruption) in developing countries, even when controlling for other socio-economic and cultural factors.

Agénor and Canuto (2015) studied the long-term impact of policies aimed at fostering gender equality on economic growth in Brazil through their effects on women's time allocation and intrahousehold bargaining power. The analysis was based on a three-period gender-based overlapping generations (OLG) model in

which women's time allocation takes centre stage and accounts for women's time allocation between market work, child-rearing, human capital accumulation, and home production. Bargaining between spouses was assumed to depend on relative human capital stocks, and thus indirectly on access to infrastructure. Thus, the model provides an endogenous macro theory of bargaining power. The model was calibrated, and various experiments were conducted, including investment in infrastructure, a reduction in gender bias in the market place, and a composite pro-growth, pro-gender reform program. The analysis showed that fostering gender equality, which may partly depend on the externalities that infrastructure creates in terms of women's time allocation and bargaining power, may have a substantial impact on long-term growth, as well as educational and health outcomes, in Brazil.

Hakura, Hussain, Newiak, Thakoor, and Yang (2016) investigated the significant impact inequality has on growth performance and also the drivers behind income inequality, as well as factors explaining its persistence in SSA using newly available data from the Standardized World Income Inequality Database (SWIID) from 1990−2010. The study used system GMM to test for the joint effects of income and gender inequality on growth at different stages of development. The result revealed that income and gender inequality jointly impede growth mostly in the initial stages of development, resulting in substantial growth losses in sub-Saharan Africa and that further progress in reducing income and gender inequality could deliver significant, sustained growth dividends, particularly for low-income countries. The growth decomposition analysis highlights that average annual GDP per capita growth in sub-Saharan African countries could be higher by as much as 0.9 percentage points if income and gender inequality were reduced to the levels observed in the fast-growing Association of Southeast Asian Nations (ASEAN). The analysis also revealed that Latin America and the Caribbean's growth shortfall compared to ASEAN is mainly explained by income inequality. Ekbrand and Halleröd (2018) used a combination of country-level data and micro-level survey data from 49 low- and middle-income countries to analyze the relationship between gender equity and malnutrition and gender equity and health deprivation among children. The results indicate that gender equity in education and employment decreases child malnutrition and that women's empowerment decreases health deprivation for children with unschooled mothers.

Cabeza-Garciac, Del Brio, and Oscanoa-Victorio (2018) investigated the gender factors that trigger economic growth in both high- and low-income countries using four characteristic dimensions of gender inclusion: education, access to the

labor market, fertility, and democracy, for 127 countries. Their findings revealed that that high fertility in women has adverse effects on economic growth. Minasyan, Zenker, Klasen, and Vollmer (2019) conducted a systematic review and meta-analysis of empirical literature to examine whether a gender gap in education harms or boosts economic performance by examining the link between gender inequality in education and per capita economic growth. They found out that studies that include male and female education as separate covariates in the growth regression reported larger correlation sizes of female compared to male education with economic growth, except when an arguably problematic regression specification is used.

Methodology

Theory and Model

This study adopted a simplified version of endogenous growth theory. Endogenous growth theory emphasizes the significant influence of endogenous variables such as macroeconomic policy and policy volatility on long-term growth. Specifically, macroeconomic policy is expected to have a substantial effect on economic growth, but the impact of these macroeconomic factors on heterogenous growth components (gender objectives) remains underexplored and less understood. Using an endogenous framework, this study explores outliers in the growth and endogenous factors relationship to reach conclusions capable of redefining policies and research on the subject. We seek quantitative answers in the links between macroeconomic policy and gender links for some factors. On the one hand, higher policy volatility could lead to conservative household measures, due to precautionary motives, resulting in lower labor force participation. On the other, it increases risk-adjusted returns, which increases investment as well as economic growth, thus leading to increased female labor participation (Bloom, Canning, Fink, & Finlay, 2009). It is therefore clearly expedient to unravel the correlates, magnitude, and policy implications of the macroeconomic policy-gender relationships using the endogenous growth framework since whatever can lead to changes in gender imbalances are most likely to influence growth objectives.

In accounting for the dynamics of the relationship between macroeconomic policy and gender imbalances in SSA, this study follows Stratigaki (2005). The empirical strategy is to estimate a series of baseline fixed-effect estimators by assuming that all explanatory variables are strictly exogenous. Second, we estimate dynamic panel data GMM estimators and impose (and test) the common factor

restrictions to account for the potential endogeneity of macroeconomic policy and gender imbalances within the Sub-Saharan countries. We estimated the dynamic system GMM for some factors. Rather than follow a conventional full-sample distribution, GMM uses assumptions about specific moments of random variables and that makes it more robust than maximum probability at the expense of some efficiency (Adekunle, Onanuga, Akinola, & Ogunbanjo, 2020). The dynamic system GMM enables the most flexible identification and is highly consistent and asymptotically normal when dealing with large sample properties (Hansen, 1982) particularly with a large cross-section and a time series dimension with $T < 25$. It can also effectively integrate moment conditions when the estimator is over-identified. Our macroeconomic policy-gender model takes the functional form:

$$GENDER_{it} = f(MACRO_{POL_{it}}) \tag{1}$$

where $GENDER_{it}$ is gender equality in country i over period t; $MACRO_{POL_{it}}$ is macroeconomic policies in country i over period t, t is the time-series dimension of the scope that the study covered (1993 through 2017), and i is the domain that contains the cross-sectional characteristics of the data (the Sub-Saharan Africa countries under investigation).

If the assumption of strict exogeneity on macroeconomic policy for gender equality is violated, our baseline fixed-effects estimator is potentially inconsistent. Therefore, to obtain asymptotically consistent parameter estimates, we estimate single equation dynamic GMM estimators by using a common factor representation (Blundell & Bond, 2000).

The dynamic panel regression model to capture the relationship between macroeconomic policy and gender imbalances is specified as follows:

$$GENDER_{it} = \rho + \omega GENDER_{it-1} + \theta MACRO_{POL_{it}} + \Sigma_j^k = {}_1\delta_j X_{j_{it}} + \mu_{it}$$
$$j = 1 \ldots\ldots, k,\ i = 1 \ldots\ldots\ldots n,\ t = 1 \ldots\ldots\ldots T \tag{2}$$

where, $GENDER_{it}$ gives gender equality which assesses the extent to which country i has installed institutions and programs to enforce laws and policies that promote equal access for men and women in education, health, the economy, and protection under the law; ρ gives the value of the dependent variable when explanatory variables are zero; $MACRO_{POL_{it}}$ denotes macroeconomic policies for country i over period t; $X_{j_{it}}$ is the other regressors included in the model as control variables for country i over period t; j is the number of included control variables,

and $\omega, \delta,$ and θ are the parameter estimates measuring the impact of explanatory variables on the dependent variables.

A country-specific fixed effect is assumed for the disturbance term as follows:

$$\varepsilon_{it} = e_i + \mu_{it}$$

where ε_{it} represents the error term. It entails e_i, which represents country-specific fixed effects that are time-invariant, while, μ_{it} is assumed to be independent with zero (0) mean and constant variance σ_μ^2 both over time and across countries that is, $u_{it} \approx n(0, \sigma_\mu^2)$.

To adjust for the violation of the orthogonal assumption in the dynamic model in (2), we differenced the equations as

$$\triangle \ln GENDER_{it} = \rho + \omega \triangle \ln GENDER_{it-1} + \theta \triangle \ln MACRO_{POL_{it}} + \Sigma_{j=1}^{k} \delta_j \triangle \ln X_{j_{it}} + \triangle \mu_{it} \quad (3)$$

However, estimating the ordinary least square on the first differenced dynamic panel model still violates the strict exogeneity assumption since the transformed error term $\triangle \mu_{it}$ still correlates with $GENDER_{it-1}$ as both contain μ_{it-1}. The possibility of $E(GENDER_{it-h} \triangle \mu_{it}) = 0 \forall\, h \geq 2,\ t = 3, \cdots\cdots T$ makes it possible to use the lagged variables as instruments to adjust the explanatory variables to be orthogonally consistent as in Anderson and Hsiao (1982), Blundell and Bond (2000), Blundell, Bond, and Windmeijer (2000).

Sources and Measurement of Data

In setting a clear line of thought on the relationship between macroeconomic policy and gender in SSA, we estimated cross-country panel data for forty-eight (48) SSA countries based on regional classifications over a period of 25 years, from 1993 through 2017. This scope, governed by data availability, allows the researchers to establish the influence of heterogenous macroeconomic policies for the realization of gender objectives across SSA countries since the IMF and World Bank austerity measures were abolished in 1992. The structural adjustment programme (SAP) era witnessed significant state-imposed austerity measures which limited consumables through a shortfall in money supply and a mindset of prioritizing exports over imports to achieve a favorable balance of payments, although never materialized. It will be interesting to see how well gender objectives have fared since the policies were abolished and alternative measures proposed in many

African nations by various political regimes.

Gender Equality *GENDER* was measured using data from the gender parity index rating for SSA countries in consonance with Shannon, Im, Katzelnick, and Franco (2013). The gender parity index for the gross enrolment ratio in primary and secondary education is the ratio of girls to boys enrolled at primary and secondary levels in public and private schools. Macroeconomic policies considered in this study are fiscal policies and monetary policies series. The monetary policies component measures used are nominal exchange rate as in Oseni, Adekunle, and Alabi (2019) and inflation as in Mboweni (1999). Fiscal policies measures used were net government expenditure (net general government expenditure includes all current government expenditures and revenues for purchases of goods and services and income received) as in Oseni, Akinbode, Babalola and Adegboyega (2020) and taxes on income, profits, and capital gains as used in the work of Casale (2012). We controlled for population growth as in Kibirige (1997) and technological change as in Asongu (2013). These controls were relevant to avert problems of omitted variable biases and because of their high relevance in explaining

Table 1
Description of Variables

Abbreviation	Description	Source	Motivating Studies?
GENDER	Gender Parity Index	UNESCO Institute for Statistics	Shannon et al. (2013)
GOV_{EXP}	Government Expenditure	World Bank National Accounts Data, and OECD National Accounts Data Files	Oseni et al. (2020)
EXC	Exchange Rate	International Monetary Fund, International Financial Statistics.	Oseni et al.
INFL	Inflation measured with the Consumer Price Index (CPI)	International Monetary Fund, International Financial Statistics.	Mboweni (1999)
TAXES	Taxes on income, profit, and capital gains	International Monetary Fund, Government Finance Statistics Yearbook and Data Files.	Casale (2012)
POP	Population Growth	World Bank National Accounts Data, and OECD National Accounts Data Files	Kibirige (1997)
TECH	Technology	World Bank National Accounts Data, and OECD National Accounts Data Files	Asongu (2013)

differences in the realization of gender objectives in SSA. The data used in this study are secondary data spanning the period from 1993 through 2017 and derived from the UNESCO Institute for Statistics, the IMF database, and World Bank Development Indicators for various issues up to 2017.

Estimation Technique

In accounting for the dynamics of macroeconomic policies and gender imbalances in SSA, the study made use of a four-prong econometric procedure. First is the pre-estimation assessment using a descriptive statistics method to help show, describe, and summarize the data in a meaningful way and also to know if the data are normally distributed through their averages and Jarque-Bera values (Gujarati & Dawn, 2009). Second is panel unit root testing to ensure the variables under investigation are covariance-stationary. The tools used here for detecting non-stationarity of the data are the panel unit-root tests developed by Levin, Lin, and Chu (2002), and Im, Pesaran, and Shin (2003). The more traditional unit-root tests, such as the Dickey-Fuller, Augmented Dickey-Fuller (ADF), Phillips-Peron, and KPSS tests, may also be applied to serve the same purpose. However, those univariate/single-equation methods are well known for their low power in small samples. By contrast, the panel unit-root tests can be more potent than the conventional tests since they combine the information from the time-series dimension with that from the cross-sectional dimension.

Since the pioneering work of Levin et al. (2002), several panel unit-root tests have become available. Here we use the tests developed by Levin et al. (2002) and Im et al. (2003). As in the literature, the tests are based on estimating the model:

$$\begin{aligned} \triangle Y_{it} &= \alpha_i + \eta_i y_{it-1} + \delta_{it} + \Sigma_{k=1}^{k_i} \theta_i^{(k)} \triangle y_{it-k} + \varepsilon_{it} \\ \varepsilon_{it} &\sim iidN(0, \theta_\varepsilon^2) i = 1,2 \ldots N, t = 1, 2 \ldots T \end{aligned} \quad (4)$$

where y_{it} denotes the variable y observed for the ith of N entities in the tth of T periods, and $\triangle$ is the difference operator. The LLC test involves the null hypothesis $H_0 : \rho_i = 0 \forall i$ against the alternative $H_A : \rho_i = \rho < 0 \forall i$. The Breitung test does not employ a bias adjustment, which results in a substantially higher power than that of the LLC test. The IPS test involves the same null hypothesis as the last test, but its alternative hypothesis allows for non-stationarity for some individuals. The idea of IPS is to compute the average of the individual ADF test

statistics.

Once stationarity of the variables has been verified, the dynamic system GMM was used to account for the structural dynamics of the model.

Results

Table 2
Summary Statistics

	GENDER	*$GOVT_{EXP}$*	*EXC*	*INFL*	*TAXES*	*POP*	*TECH*
Mean	5.764	3.523	3.242	4.842	5.838	2.422	3.563
Median	4.611	2.904	2.592	3.635	4.969	1.453	2.662
Maximum	34.435	10.998	9.911	4.456	8.127	3.637	4.883
Minimum	2.517	4.626	5.963	1.235	3.570	0.452	1.552
Std. Dev.	6.422	9.423	2.885	3.454	2.354	1.324	1.453
Skewness	3.370	0.822	3.532	2.492	3.781	4.572	2.883
Kurtosis	1.642	2.115	8.038	2.754	8.039	1.472	2.773
Jarque-Bera	206.010	97.551	307.963	572.356	987.010	89.422	22.672
Probability	0.381	0.229	0.525	0.457	0.826	0.239	0.372
Observations	1200	1200	1200	1200	1200	1200	1200

Source: Authors, 2020

Table 2 shows the mean and median values of the variables in the panel dataset lie within the maximum and minimum values, indicating a high tendency toward a normal distribution. All the variables are positively skewed. The kurtosis statistics show that all the variables are platykurtic, suggesting that their distributions are flat relative to a normal distribution (values are less than 3). The Jarque-Bera statistics show that the series is normally distributed since the p-values of all the series are not statistically significant at a 5% level. Thus, informing the acceptance of the alternate hypothesis that says each variable is normally distributed.

Levin-Lin-Chu (LLC) Test

As presented in Table 3 below, one of the first panel unit root tests formulated by Levin et al. (2002) suggests the following hypotheses for testing stationarity in panel data. Under the null hypothesis, the LLC test shows that each time series

contains a unit root, i.e., $H_0: \rho_i = 0 \forall i$, and for the alternative hypothesis, each time series is stationary, i.e., $H_A: \rho_i = \rho < 0 \forall i$. Like other unit root tests in the literature, the LLC assumes that the individual processes in each cross-section are independent. The LLC test is mainly based on the estimation of the following equation;

$$\triangle Y_{it} = \alpha_i + \delta_{it} + \theta_t + \rho_i y_{it-1} + \varsigma_i, t \quad (5)$$

where i=1, 2 ⋯ N, t=1, 2 ⋯ T

This test might potentially be treated as a pooled Dickey-Fuller or augmented Dickey-Fuller test with different time lags across the units of the panel.

Im-Pesaran-Shin (IPS) test

The IPS test, formulated by Im et al. (2003), is an extension of LLC test incorporating heterogeneity in the dataset under the alternative hypothesis. Here, IPS test estimation is also based on Eq. (5). The null hypothesis is stated as $H_0: \rho_i = 0 \forall i$ against the alternative hypothesis of $H_A: \rho_i < 0$ where i=1, 2, 3, ⋯, N_1; $\rho_i = 0$, $i = N_1 + 1, N_1 + 2, \cdots, N$.

In the IPS test, it is presumed that all series are non-stationary under the null hypothesis and a fraction of the series is stationary under the alternative hypothesis. This is how it differs from the LLC test, in which all series are supposed to be stationary under the alternative hypothesis. The outcomes of LLC and the IPS test are shown in Table 3. All tests confirmed that variables are non-stationary at levels and stationary after first differences. It is thereby inferred that variables are first difference stationary.

Table 3
Panel Unit Root Test

Variables	*GENDER*	*GOVT*$_{EXP}$	*EXC*	*INFL*	*TAXES*	*POP*	*TECH*
Levin-Lin-Chu (LLC)	1.134*	3.526*	0.498**	2.568**	0.725*	1.552**	0.662*
Im-Pesaran-Shin (IPS)	-1.742*	0.837**	-0.778*	-0.043**	-1.562*	-0.067**	1.323*

*Significant at 1%; **significant at 5%
Source: Authors, 2020

Table 4
Empirical Result from the Dynamic System GMM- Robust Two-Step Estimate

Dependent Variable: Gender Equality (ΔlnGENDER)			
Variables	**Coefficients**	**T-Statistics**	**P-Value**
Constant ρ	2.673	6.872	0.000*
Lag Regressor of Response Variable $GENDER_{it-1}$	0.476	3.737	0.048**
$GOVT_{EXP}$ Government Expenditure	0.159	2.263	0.063*
EXC Exchange Rate	-0.562	-4.377	0.017**
$INFL$ Inflation measured with consumer Price Index (CPI)	0.493	3.253	0.042**
$TAXES$ Taxes on income, profit and capital gains	-0.324	-4.532	0.034**
POP Population Growth	-0.683	-3.263	0.043**
$TECH$ Technology	0.243	4.4532	0.026**
F-test of Joint Significance	$F = 1845.39$		
Arellano Bond for AR(1) in First Differences	$z = -2.54\ pr > z = 0.003$		
Arellano Bond for AR(2) in First Difference	$z = -0.84\ pr > z = 0.593$		
Hansen J-Test for Overidentifying Restrictions	$Chi2(4) = 1.67$ $Prob > chi(2) = 0.851$		
Instruments	7		
Countries	48		
Observations	1200		

Source: Author, 2020

Note. The *Two-Step* statistics were obtained after taking the natural logs; *significant at 1%; ** significant at 5% respectively; the bold values represent significant values for the estimated output elasticities, failure to reject the null of over-identifying restrictions.

The outcome of the dynamic two-step system GMM is contained in Table 4. The coefficient of the lagged dependent variable is positive and statistically significant at a 5% level. This conforms with theoretical predictions that the previously attained level of gender equality influences prevailing gender equality. The trend in the gender discourse particularly in terms of education, female representation in governance and management boards across major organizations is essential in scaling new heights in equal gender representation and pay (Adekunle, Tella, &

Adelowokan, 2020). Thus, a percentage increase lagged dependent variable will result in 0.476% increase in the attainment of gender equality in SSA. Further evidence from this study revealed that the two fiscal policy measures have contrasting effects on gender attainment in SSA, with an increase in government expenditure having a positive effect and taxes on income, profits, and capital gains having a negative influence on gender equality in SSA (both at a 5% level of significance). Based on this, we aver that an appropriate fiscal policy interaction that takes into consideration the socio-economic status of SSA residents will most likely produce the most gains in the pursuit of an egalitarian society that is free from gender imbalances. Explicitly, we have established that a percentage increase in government expenditure and taxes on income, profits, and capital gains would respectively lead to a 0.159% increase and a 0.324% decrease in the gender disparity index in SSA. These results align with the findings of Anyanwu (2016) in their analysis of gender and youth employment in Africa.

In other findings, monetary policy indices have a mixed effect on the gender disparity index in SSA. With negative and positive relations with the gender disparity index at a 5% significance threshold, we establish that a 1% percentage increase in the exchange rate and inflation will lead respectively to a 0.562% decrease and a 0.493% increase in the gender disparity index in SSA. These results are similar to those found in Diouf and Pépin (2017); those in Cho (2016) could be due to undesirable exchange rate fluctuations, which caused commodity prices to increase beyond an acceptable threshold. The uneven exchange rate and commodity price factors have consequences for a large pool of SSA women who are predominantly engaged in jobs located in the informal economy. A persistent rise in general price levels could be interpreted as additional cash flow in an economy largely dominated by women, and in turn, as the labor participation rate increases, female income increases and female welfare also increases. However, the worsening exchange rate hurts these growth trajectories in SSA, which is overly import-dependent, causing a decline in purchasing power parity and leading to hardship.

This study found that population growth worsens gender parity gains, an inverse relationship confirmed in our study. At a 5% level of significance, a 1% percentage increase in population will result in a 0.683% decrease in gender parity in SSA. This result affirms that even under the most favorable conditions, gender parity objectives may be difficult to realize when the population continues to grow as is currently the case in SSA. Population growth makes shared resources increasing difficult to redistribute evenly, keeps pressure on female quota representations, and could even leave some women at a disadvantage in navigating their socio-eco-

nomic desires. However, technological change could lead to faster realization of gender objectives. With a 1% percentage increase in technological change leading to a 0.243% increase in gender parity in SSA (5% level of significance), this study found similar results to Murage, Pittchar, Midega, Onyango, and Khan (2015). The positive relationship between technological change and gender equality could be due to recent advances in globalization and smart technology that has seen economies transform from industry-based to service-centric. The path of green evolution could also explain this relationship since physical interactions are beginning to play less of a role in modern economic development. Even with a public health crisis of COVID-19 dimensions, the role of technological change has spread beyond IT firms to other sectors that are necessarily not driven by IT capacities. All these structural transformations have exposed age-long dichotomies as regards gender emancipation and the role of macroeconomic policies in gender balances.

We tested for the validity of the instrument used in the system GMM technique. Compared to the OLS model system GMM does not assume normality, and it allows for heteroscedasticity in the data. Irrespective of the kind of model, dynamic panels are known for heteroskedasticity problems in the data set, which can be controlled (Kittler et al., 2000). The system GMM approach assumes linearity and that the error terms not autocorrelated, justifying the need to test for the validity of the instruments through the examination of the first order and second-order autocorrelation in the disturbance term. In tandem with Arellano and Bond (1991) the GMM estimator requires the presence of first-order serial correlation and not second-order serial correlation in the residual term. Since the null hypothesis inference assumes no first-order and second-order serial correlation, we reject the null hypothesis in the first-order serial correlation and accept the null hypothesis for the second-order serial correlation test in order to obtain appropriate diagnostics. The result above confirms the existence of first-order serial correlation since the null hypothesis of first-order serial correlation was rejected ($z = -2.54$; $p < 0.05$) at a 5% significance level and no second-order serial correlation since the null hypothesis of no second order serial correlation is accepted because calculated z is not statistically significant at 5% ($z = -0.84$; $p > 0.05$). This, therefore, supports the validity of our model specification. The Hansen J-statistics test the null hypothesis of correct specification and valid overidentified restrictions, i.e. the validity of instruments as demonstrated by Oguzie, Onuoha, and Onuchukwu (2005). They argued further that Hansen J-Statistics is the most commonly used diagnostics test in GMM estimation for assessment of a model's appropriateness. The results of the Hansen J-Statistics test of overidentifying re-

strictions do not reject the null hypothesis at any conventional level of significance ($p > 0.05$; $i.e\ p = 0.851$), thus, confirming the model has valid instrumentation. The F-statistics value for all the variables are jointly significant at a 5% level of significance.

Table 5
Robustness Results: Pooled OLS and Fixed Effect Results

Dependent Variable: (ΔlnGENDER)		
Variables	**POLS**	**FE**
Constant ρ	0.782*(1.562)	0.444(2.673)
Lag Regressor of Response Variable $GENDER_{it-1}$	0.232**(2.672)	0.636(1.662)
$GOVT_{EXP}$ **Government Expenditure**	-0.059*(2.562)	0.562(672)
EXC **Exchange Rate**	0.562*(1.562)	0.662*(4.882)
INFL **Inflation measured with consumer Price Index (CPI)**	0.442*(8.672)	0.342*(1.782)
TAXES **Taxes on income, profit and capital gains**	0.982*(2.772)	0.722*(1.763)
POP **Population Growth**	-0.367**(0.672)	0.553(1.762)
TECH **Technology**	-0.553(0.372)	-0.826**(-1.389)
F Stat	73.763*	82.562*
Adjusted R^2	0.552	0.842
Countries	48	48
Observations	1200	1200

Source: Author, 2020

Note. The statistics were obtained after taking the natural logs $*P < 0.01$, $**P < 0.05$, respectively; the Coefficients are reported in the text box and the T-Stat in parenthesis.

In order to check the validity of the system GMM results, the study also employed pooled OLS and fixed effects in line with Blundell, Bond, and Windmeijer (2000). They suggested additional detections of dynamic panel validity by checking if the estimated coefficient of the lagged dependent variables lies between the values obtained from pooled Ordinary Least Square (POLS) and Fixed Effect (FE) estimators. Our results established that, as seen in Table 5, the coefficient of the lagged dependent variables of the system GMM results lies between the values obtained from the POLS and FE estimators ($FE = 0.232 < GMM = 0.4765 < POLS = 0.636$).

Conclusions and Recommendation

This paper explains the implications of macroeconomic policies for the attainment of gender equality in SSA from 1993 through 2017. In evaluating its objectives, the paper adopts the dynamic system GMM to account for the short-run dynamics of the model as well as established the robustness of the model estimated. The empirical result reveals that previously attained levels of gender equality influence prevailing gender equality. Also, exchange rates and inflation exhibit an inverse relationship with the attainment of gender equality in SSA, while government expenditure is positively and linearly related to this attainment. Given these empirical findings, in countries where women's opportunities to earn a living are limited by cultural and economic factors, public policies could be geared to enhancing women's employment possibilities, yielding benefits to their homes and their children, and ultimately their societies. In this context, taking account of gender differences in economic behavior and in the effects of public policies already enriches economic modelling and influences public policy decisions, ranging across the structure of the tax system, government spending programs, and social insurance programs as well as regulatory policies and structural reforms. The findings of this study agree with the conclusions from Seguino (2020) and Seguino and Grown (2006, 2011) . It is therefore recommended that in determining the pace and composition of fiscal adjustment, it is important to consider the potentially harsher short-term effects on women of economic austerity and structural adjustment measures to avoid exacerbating gender inequalities. Over the medium and long term, fiscal and structural policy measures should be designed to further reduce gender inequalities and ensure that women can take full advantage of the beneficial effects of improvements in macroeconomic conditions.

References

Adekunle, I. A., Onanuga, A. T., Akinola, O. O., & Ogunbanjo O. W. (2020). Modelling Spatial Variations of Coronavirus Disease (COVID-19) in Africa. *Science of the Total Environment*, *729*(10), 138998. doi:https://doi.org/10.1016/j.scitotenv.2020.138998

Adekunle, I. A., Tella, S. A., & Adelowokan O. A. (2020). Demographic responses to political transformation in Africa. *Estudios de Economia Aplicada*, *38*(2), 1−12.

Adekunle, I. A., Williams, T. O., Omokanmi O. J., & Onayemi, S. O. (2020). Mediating roles of institutions in the remittance-growth relationship: Evidence from Nigeria. Forthcoming in *Economic Annals*. Retrived from http://www.afridev.org/RePEc/agd/agd-wpaper/Mediating-roles-of-institutions-in-the-remittance-growth-relationship.pdf

Abebe, J. O., & Jepkiyeny, A. (2016). Accelerating action to end violence against women and girls in Africa. *SSRN Electronic Journal*. doi:https://doi.org/10.2139/ssrn.2797611

Adjiwanou, V., & LeGrand, T. (2014). Gender inequality and the use of maternal healthcare services in rural sub-Saharan Africa. *Health and Place*, *29*, 67−78. doi:https://doi.org/10.1016/j.healthplace.2014.06.001

Agénor, P. R., & Canuto, O. (2015). Gender equality and economic growth in Brazil: A long-run analysis. *Journal of Macroeconomics*, *43*, 155−172. doi:https://doi.org/10.1016/j.jmacro.2014.10.004

Anderson, T. W., & Hsiao, C. (1982). Formulation and estimation of dynamic models using panel data. *Journal of Econometrics*, *18*(1), 47−82. doi:https://doi.org/10.1016/0304-4076(82)90095-1

Anyanwu, J. C. (2016). Analysis of gender equality in youth employment in Africa. *African Development Review, 28*(4), 397−415. https://doi.org/10.1111/1467-8268.12220

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), 277−297. doi:https://doi.org/10.2307/2297968

Asongu, S. A. (2013). How has mobile phone penetration stimulated financial development in Africa? *Journal of African Business*, *14*(1), 7−18. doi:https://doi.org/10.1080/15228916.2013.765309

Aterido, R., Beck, T., & Iacovone, L. (2013). Access to finance in Sub-Saharan Africa: Is there a gender gap? *World Development*, *47*, 102−120. doi:https://doi.org/10.1016/j.worlddev.2013.02.013

Auspurg, K., Hinz, T., & Sauer, C. (2017). Why should women get less? Evidence on the gender pay gap from multifactorial survey experiments. *American Sociological Review*, *82*(1), 179−210. doi:https://doi.org/10.1177/0003122416683393

Baliamoune-Lutz, M. (2007). Globalisation and gender inequality: Is Africa different? *Journal of African Economies*, *16*(2), 301–348. doi:https://doi.org/10.1093/jae/ejl037

Baliamoune-Lutz, M., & McGillivray, M. (2015). The impact of gender inequality in education on income in Africa and the Middle East. *Economic Modelling*, *47*, 1–11. doi:https://doi.org/10.1016/j.econmod.2014.11.031

Berik, G., van der Meulen Rodgers, Y., & Seguino, S. (2009). Feminist economics of inequality, development, and growth. *Feminist Economics*, *15*(3), 1–33. doi:https://doi.org/10.1080/13545700903093524

Bloom, D. E., Canning, D., Fink, G., & Finlay, J. E. (2009). Fertility, female labor force participation, and the demographic dividend. *Journal of Economic Growth*, *14*(2), 79–101. doi:https://doi.org/10.1007/s10887-009-9039-9

Blundell, R., & Bond, S. (2000). GMM Estimation with persistent panel data: An application to production functions. *Econometric Reviews*, *19*(3), 321–340. doi:https://doi.org/10.1080/07474930008800475

Blundell, R., Bond, S., & Windmeijer, F. (2000). Estimation in dynamic panel data models: Improving on the performance of the standard GMM estimator. *Advances in Econometrics*, *15*, 53–91. doi:https://doi.org/10.1016/S0731-9053(00)15003-0

Branisa, B., Klasen, S., & Ziegler, M. (2013). Gender inequality in social institutions and gendered development outcomes. *World Development*, *45*, 252–268. doi:https://doi.org/10.1016/j.worlddev.2012.12.003

Cabeza-García, L., Del Brio, E. B., & Oscanoa-Victorio, M. L. (2018). Gender factors and inclusive economic growth: The silent revolution. *Sustainability (Switzerland), 10*(1), 1–14. doi:https://doi.org/10.3390/su10010121

Casale, D. M. (2012). Indirect taxation and gender equity: Evidence from South Africa. *Feminist Economics*, *18*(3), 25–54. doi:https://doi.org/10.1080/13545701.2012.716907

Cho, S. Y. (2016). Does gender equality promote social trust? An empirical analysis. *World Development, 88*, 175–187. doi:https://doi.org/10.1016/j.worlddev.2016.07.019

Clark, M. E., & Bower, J. D. (2016). Career experiences of women with major financial barriers. *Career Development Quarterly, 64*(4), 373–386. doi:https://doi.org/10.1002/cdq.12072

Cuberes, D., & Teignier, M. (2012). Gender gaps in the labor market and aggregate productivity. *Sheffield Economic Research Paper Series* (Sheffiedl Economic Research Paper Series SERP No. 2012017). Retrieved from http://eprints.whiterose.ac.uk/74398/1/serps_2012017.pdf

Diouf, I., & Pépin, D. (2017). Gender and central banking. *Economic Modelling. 61*, 193–206. doi:https://doi.org/10.1016/j.econmod.2016.12.006

Ekbrand, H., & Halleröd, B. (2018). The more gender equity, the less child poverty?

A multilevel analysis of malnutrition and health deprivation in 49 low- and middle-income countries. *World Development, 108*, 221−230. doi:https://doi.org/10.1016/j.worlddev.2018.01.028

Elson, D., & Cagatay, N. (2000). The social content of macroeconomic policies. *World Development, 28*(7), 1347−1364. https://doi.org/10.1016/S0305-750X(00)00021-8

Ferrant, G., Pesando, L. M., & Nowacka, K. (2014). Unpaid care work: The missing link in the analysis of gender gaps in labor outcomes. *Boulogne Billancourt, OECD Development Centre, 12*.

Gujarati, D., & D. Porter (2009). *Basic Econometrics* (4th ed.). New York, NY: McGraw-Hill International Edition.

Hakura, D., Hussain, M., Newiak, M., Thakoor, V., & Yang, F. (2016). *Inequality, gender gaps and economic growth: Comparative evidence for Sub-Saharan Africa* (No. WP/16/111). IMF Working Papers (Vol. 16). https://doi.org/10.5089/9781484382349.001

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica 50*(4), 1029−1054. doi:https://doi.org/10.2307/1912775.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics, 115*(1), 53−74. doi:https://doi.org/10.1016/S0304-4076(03)00092-7

Kabeer, N. (2005). Gender equality and women's empowerment: A critical analysis of the third Millennium Development Goal 1. *Gender and Development, 13*(1), 13−24. doi:https://doi.org/10.1080/13552070512331332273

Kibirige, J. S. (1997). Population growth, poverty and health. *Social Science and Medicine, 45*(2), 247−259. doi:https://doi.org/10.1016/S0277-9536(96)00341-3

Kittler, J. T., Wang, J., Connolly, C. N., Vicini, S., Smart, T. G., & Moss, S. J. (2000). Analysis of GABA(A) receptor assembly in mammalian cell lines and hippocampal neurons using γ2 subunit green fluorescent protein chimeras. *Molecular and Cellular Neurosciences 16*(4), 440−452. doi:https://doi.org/10.1006/mcne.2000.0882

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics, 108*(1), 1−24. doi:https://doi.org/10.1016/S0304-4076(01)00098-7

Mayoux, L. (1999). Questioning virtuous spirals: Micro-finance and women's empowerment in Africa. *Journal of International Development, 11*(7), 957−984.

Mboweni, T. T. (1999). Inflation targeting in South Africa. *The South African Journal of Economics, 67*(4), 221−225. doi:https://doi.org/10.1111/j.1813-6982.1999.tb01152.x

Minasyan, A., Zenker, J., Klasen, S., & Vollmer, S. (2019). Educational gender gaps and economic growth: A systematic review and meta-regression analysis. *World*

Development, 122, 199–217. doi:https://doi.org/10.1016/j.worlddev.2019.05.006

Murage, A. W., Pittchar, J. O., Midega, C. A. O., Onyango, C. O., & Khan, Z. R. (2015). Gender specific perceptions and adoption of the climate-smart push-pull technology in eastern Africa. *Crop Protection. 76*, 83–91. doi:https://doi.org/10.1016/j.cropro.2015.06.014

Ogede, J. S., Adekunle, I. A., & Adegboyega, S. B. (2020). Macroeconomic policy and gender equality: Evidence from Nigeria. *Dutse International Journal of Social and Economic Research, 4*(2), 70–79.

Oguzie, E. E., Onuoha, G. N., & Onuchukwu, A. I. (2005). Inhibitory mechanism of mild steel corrosion in 2 M sulphuric acid solution by methylene blue dye. *Materials Chemistry and Physics, 89*(2–3), 305–311. doi:https://doi.org/10.1016/j.matchemphys.2004.09.004

Oseni, I. O., Adekunle, I. A., & Alabi, M. O. (2019). Exchange rate volatility and industrial output growth in Nigeria. *Journal of Economics and Management, 38*(4), 129–156. doi:https://doi.org/10.22367/jem.2019.38.07

Oseni I. O., Akinbode, S. O., Babalola, D. A., & Adegboyega, S. B. (2020). Government spending and school enrolment in sub-Saharan Africa: A system GMM approach. *Journal of Economics and Management, 40*(2), 91–108. doi:https://doi.org/10.22367/jem.2020.40.05

Potrafke, N., & Ursprung, H. W. (2012). Globalization and gender equality in the course of development. *European Journal of Political Economy, 28*(4), 399–413. doi:https://doi.org/10.1016/j.ejpoleco.2012.04.001

Power, A., Boughen, A., & Ames, C. (2019). Out of Africa: Students' reflections on the personal and professional impact of volunteering. *British Journal of Midwifery, 27*(1), 59–61. doi:https://doi.org/10.12968/bjom.2019.27.1.59

Quisumbing, A. R., & Pandolfelli, L. (2010). Promising approaches to address the needs of poor female farmers: Resources, constraints, and interventions. *World Development, 38*(4), 581–592. doi:https://doi.org/10.1016/j.worlddev.2009.10.006

Rendall, M. (2013). Structural change in developing countries: Has it decreased gender inequality? *World Development, 45*, 1–16. doi:https://doi.org/10.1016/j.worlddev.2012.10.005

San Vicente Portes, L., Atal, V., & Juárez-Torres, M. (2019). From households to national statistics: Macroeconomic effects of women's empowerment. *Economic Modelling, 79*, 286–294. doi:https://doi.org/10.1016/j.econmod.2019.01.024

Sarich, J., Olivier, M., & Bales, K. (2016). Forced marriage, slavery, and plural legal systems: An African example. *Human Rights Quarterly, 38*(2), 450–476. doi:https://doi.org/10.1353/hrq.2016.0030

Seguino, S. (2020). Engendering macroeconomic theory and policy. *Feminist Economics, 26*(2), 27–61. doi:https://doi.org/10.1080/13545701.2019.1609691

Seguino, S., & Grown, C. (2006). Gender equity and globalization: Macroeconomic policy for developing countries. *Journal of International Development, 18*(8), 1081–1104. doi:https://doi.org/10.1002/jid.1295

Seguino, S., & Grown, C. (2011). Feminist-Kaleckian macroeconomic policy for developing countries. *SSRN Electronic Journal*. doi:https://doi.org/10.2139/ssrn.900565

Shannon, G. D., Im, D. D., Katzelnick, L., & Franco, O. H. (2013). Gender equity and health: Evaluating the impact of Millennium Development Goal Three on women's health in South Asia. *Women and Health, 53*(3), 217–243. doi:https://doi.org/10.1080/03630242.2013.767300

Somolu, O. (2007). "Telling our own stories": African women blogging for social change. *Gender and Development, 15*(3), 477–489. doi:https://doi.org/10.1080/13552070701630640

Stotsky, J. G. (2006). Gender and its relevance to macroeconomic policy: A survey. *IMF Working Papers*, *2006*(233). doi:https://doi.org/10.5089/9781451864939.001

Stratigaki, M. (2005). Gender mainstreaming vs positive action: An ongoing conflict in EU gender equality policy. *European Journal of Women's Studies, 12*(2), 165–186. doi:https://doi.org/10.1177/1350506805051236

United Nations. (2018). United Nations Sustainable Development. Retrieved from https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Wekwete, N. N. (2014). Gender and economic empowerment in Africa: Evidence and policy. *Journal of African Economies, 23*(1), 87-127. doi:https://doi.org/10.1093/jae/ejt022

Wyndow, P., Li, J., & Mattes, E. (2013). Female empowerment as a core driver of democratic development: A dynamic panel model from 1980 to 2005. *World Development, 52*, 34–54. doi:https://doi.org/10.1016/j.worlddev.2013.06.004

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