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Classification: LCC Code: KF26

Language: English

London Journals Press

LJP Copyright ID: 573333
Print ISSN: 2515-5784
Online ISSN: 2515-5792

London Journal of Research in Humanities and Social Sciences

Volume 22 | Issue 19 | Compilation 1.0

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ABSTRACT

Over the past two decades, issues related to solid gender disparities have gained prominence in the labor market in developing countries. Previous studies have addressed the issue of women's discrimination in terms of the gender pay gap without addressing the real impact of women's promotion to formal employment on economic growth. This study examines the effect of women's advancement in formal jobs on GDP per capita.. To examine this relationship in sufficient depth, we used data from 40 African countries from 2000 to 2019 issued from the World Bank database, and we used Dumitrescu and Hurlin's (2012) Granger causality testing procedure and the GMM model. Results show a causal relationship between the labor force, investment, human development index, trade openness and the proportion of women in formal wage work, and the GDP per capita of African countries. Results of the GMM model show that investment, trade openness and the proportion of women in formal work have positive and significant effects on GDP per capita. Regarding policy implications, African countries should invest more, develop regional integration, and promote women's formal wage employment for sustainable and inclusive development.

Keywords: formal employment, salaried employment, discrimination, women, africa, GDP per capita.

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I. INTRODUCTION

After the establishment of the Millennium Development Goals (MDGs) in the early 2000s, labor market challenges have become more and more of an important issue for development policy. Previous centuries, women have tended to withdraw from the labor market when they marry and become mothers. This situation has its roots in the traditions and cultures of peoples and the principles developed during the nineteenth century by social theorists and economists. Theory of two spheres proposed by RUSKIN in 1864, supports the idea that the world of women is different from that of men[78]. This theory is based on the principles that women have a role as wives, mothers and educators, and therefore have a reserved place in the home, while men are the producers of wealth and resources. These principles or ideologies have contributed to limiting the prospects for development, for the advancement of women, and are at the root of the discrimination observed in our modern societies between men and women in the labor market[36-52-82-86] . The Sustainable Development Goals 2022 report, states that in 18 countries worldwide, men have the right to prevent their wives from working (UN, 2022). Also 49 countries do not have laws protecting women from domestic violence. This forces women to disproportionately engage in everyday work and the agricultural sector that does not offer social protections such as minimum wage and maternity leave [53-70]. Earlier study by Krogh et al (2009) shows that in developing countries, the majority of women work in the informal economy. Many are domestic workers or casual laborers in factories, while others are unpaid workers on farms.

In most developing and Sub-Saharan African countries, discrimination against women in the

labor market is high and the wage gap remains considerable. Indeed, Kolen et al.'s (2009) analyses of Sub-Saharan African economies reveal a significant gender pay gap. Average interval between women's and men's weekly earnings ranged from 23 percent (Burkina Faso) to 79 percent (Ghana). In Senegal in 2018, women's unemployment rate was nearly four times higher than men's (26 percent vs. 7.4 percent, respectively) and their labor force participation rate is 13.2 percentage points lower than men's [69]. In Ethiopia, Mali, and Mauritius, women spend 22 percent, 20 percent, and 19 percent of their day on domestic and caregiving tasks, respectively, while men spend 8.7 percent, 2.5 percent, and 4.8 percent of their day on these tasks, respectively.

The existing literature on this issue of women's formal employment and the gender wage gap justifies the observed gaps by women's lower level of education[8-73], and by issues of inadequate skills, a lack of knowledge of job search techniques, unpaid domestic responsibility, and mobility restriction [8-34-74-77]. Others the difference results from the disparity in the number of hours of work done at the service and the job held[46]. Other theoretical work has focused on three main explanations for gender gaps in labor markets[73]. These explanations cover the female labor supply side, namely (i) the human capital model [79-22], (ii) the household production model[22] , and (iii) the work-leisure choice theory.

According to Périvier et al (2018), women are also poorly represented in formal wage employment. Their share of wage employment in the non-agricultural sector remains relatively low, averaging about 36.5 percent worldwide, with significant disparities between countries. Lokina et al (2017) pointed out that in Tanzania, male workers account for 71 per cent of formal sector employment, while women are mainly employed in low-income jobs, such as unpaid family helpers. Estimates of UN in 2022 on the current status of the implementation of the SDGs reveal that at the current rate, the gender wage gap, which stands at 23% globally, will not be closed until 2086.

The low participation of women in formal jobs in developing countries raises the issue of under-utilization of a part of the labor force capable of contributing effectively to improved national wealth production and economic growth. Indeed, advocates of human capital or endogenous growth theory support the idea that both labor and capital factors contribute to improving economic growth and that the quality of the labor factor is a fundamental element in understanding the dynamics of growth. The different theories or ideologies have been endorsed by Mill (1909), Mincer (1958), Becker (1975), Barro et al (1994), Romer (1986, 1992), Amable (1992) and Lucas (1988). Most of these authors support the importance of employment in the socio-economic progress of nations. Work by Klasen (1999), Wang et al. (2016), and Aldén et al. (2021) has also shown the negative effect of gender inequalities in education and employment on development outcomes. However, our research has found that very few empirical studies have focused on the actual effect of promoting women into formal wage employment on economic growth.

In this perspective, the question that emerges in this research is: what is the effect on per capita income of promoting women to formal wage employment? Thus, in line with the reflections of previous studies, this study aims to examine the effect of an increase in the proportion of women in formal wage employment on GDP per capita in Africa.

There are real interests in analyzing the effects of the promotion of women to formal wage employment. On the one hand, these interests lie in the desire for national and international policies to give women financial autonomy and to reduce the various forms of discrimination between women and men in the labor market. Other hand, the study contributes to highlighting the stakes of the promotion of women to increase the creation of national wealth. The study could also contribute to the success of poverty reduction strategies, the fight against discrimination against women in the labor market and efforts to stimulate economic growth and development in Africa.

To achieve this objective, the paper is organized into 5 sections. After an introduction, the following section reviews theoretical and empirical literature on the subject. Literature review section is followed by the estimation methodology, followed by a section showing the results and the discussion, and the last makes a summary of the main points and policy recommendations.

II. LITERATURE REVIEW

The theoretical foundations of growth are based on the theory of endogenous growth, according to which the accumulation of human capital, the labor force (active population), investment (gross fixed capital formation), innovations and new technologies are at the origin of economic growth. This theory has been defended in the works of Nelson et al. (1966), Romer (1990), Barro (1991), Mankiw et al. (1992), Barro et al. (1994), Barro (1996) and Bloom et al. (1998). For most of these authors, human capital accumulation is the primary driver of economic development in the long run. Several other works such as Dalgaard et al (2001), Bucci (2008) and Strulik et al (2013) have shown the positive effect of education on human capital and economic growth. Fuente et al. (2006), Cohen et al. (2007), Lutz et al. (2008), Hanushek et al. (2012, 2015), and Cuaresma et al. (2014), Bouoiyour et al. (2002), Bolli et al. (2019), Fukao et al. (2021), Goenka et al. (2020), Han et al. (2020), Osiobe (2019) also showed a positive impact of labor force educational attainment on economic growth in Morocco. Essardi et al. (2017) Prettner et al. (2019), YEN et al. (2020), ACHCHAB et al. (2021). Affandi et al (2019) also found a positive and significant effect of education and literacy on economic growth in different developing countries.

Other research highlighted the critical role of workers' health on economic growth. Indeed, the work of Barro (1996), Knowles et al. (1997) and Bloom et al. (1998) have shown that improvements in life expectancy at birth have a positive and statistically significant impact on economic growth in these countries. Bloom et al. (2004) concluded that an increase in life expectancy of one year increases productivity by 4%. This positive effect of life expectancy at birth on the level of GDP per capita has been confirmed in the work of Ashraf et al. (2008), Essardi et al. (2017), Yen et al. (2020), Achchab et al. (2021), Bloom et al. (2019).

In recent years, other works have focused on the positive effect of investment on economic growth. Baneliene et al. (2020) confirmed the positive impact of investment on economic growth in EU countries. Lin et al (2018) found similar results for countries such as Mexico, Indonesia, Nigeria and Turkey. Also, these authors showed the negative effect of inflation on growth. Dinh et al (2019) also show that domestic investment has a positive impact in 30 developing countries in the lower middle income group. Lawin (2020) has also demonstrated the positive impact of investment on Benin's economic growth. The work of Asongu et al (2020) and Acquah et al (2020) has also highlighted the positive impact of ICT investment and development on the economic growth dynamics of sub-Saharan African countries and on the development of the financial sector in Africa.

Two arguments are often used in the literature to support the issue of women's contribution to the development and economic growth. The first argument is about job opportunities for women and their freedom to work in safety and dignity. The second argument is economic, highlighting women's financial capabilities and potential contribution to economic growth[58] (Krogh et al., 2009). Economic ideas are based on the fact that women tend to reinvest their income in improving the health, and education of household members. Thereby raising living standards and reducing non-income poverty. Thus, since the second half of the 20th century, several authors have emphasized the contribution of women to production and economic growth. They highlighted the existence of gender disparity in the labor market and the production process. For Sofer (1990), and Kabungu et al. (2021) this disparity manifests itself mainly in two forms, namely, a difference in wages in favor of men and a differential distribution of jobs by gender.. Analysts who have worked to identify critical factors underlying the dynamics of

disproportionate participation between men and women in labor markets find that the observed disparities are indeed due to limited employment opportunities, differences in educational attainment, power dynamics within households, different endowments of training and work experience, and industry [22-43-41-9-36-80-86-25]. Despite previous thinking, there hasn't been solid research on the effect of increasing the share of women in formal employment on economic growth. This study sets out to examine this effect in the case of African countries.

III. DATA AND METHODS

3.1 Data Source

This study uses a panel of 40 countries in Africa. The countries considered are Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Democratic Republic of Congo, Egypt, Eswatini, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Libya, Madagascar, Mali, Mauritius, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Uganda, Rwanda, Senegal, Sierra Leone, South Africa; Sudan, Tanzania, Togo, Tunisia. The selection of these countries is justified by the availability of the necessary data to conduct the analysis.The data used comes from the World Bank database from 2000 to 2019.

The variables used are essentially GDP per capita (GDP), gross fixed capital formation (GFCF), labor force (POPAc), consumer price index (CPI), trade openness (TO), wage and salaried workers, female (% of female employment) (TSF), and the human development index (HDI). The variable GDP per capita is an indicator of the country's level of development and economic growth.. It is the variable explained in this study. The choice of gross fixed capital formation and the working population is inspired by economic theory, which assumes that production in an economy is determined by capital stock (investment) and labor or human capital (working population). Trade openness then determines the variable wage and salaried workers, and female is the variable of interest. The World Bank defines salaried workers (employees) as workers who perform salaried work. They have a formal employment contract (written or oral) that provides them with a basic salary. The Human Development Index (HDI) is a combined indicator that includes life expectancy at birth and educational attainment, and thus is relevant for measuring the human capital.

3.2 Descriptive Statistics

The data cover the period 2000-2019, i.e., 20 observations per country and 800 observations for the panel. Table 1 below presents the proportion of women in formal wage employment (Wage and salaried workers, female (% of female job)). This table allows us to conduct two types of analysis: an analysis according to the participation rate of women in formal wage employment and a study of whether there is an improvement in women's participation in formal wage employment from one decade to the next. Referring to the column for the period 2000-2019, fourteen (14) countries in Africa have an average rate below 10%. This means that over 2000-2019, less than 10% of employed women were in formal wage jobs in these countries. Ten (10) countries out of 40 have an average speed between 10% and 20%, six (6) countries have an average speed between 20% and 50%, and ten (10) countries have an average rate between 50 and 85%. Among the countries with an average speed between 50 and 85% over the period 2000-2019, we have Algeria, Botswana, Egypt, Eswatini, Gabon, Libya, Mauritius, Namibia, South Africa, and Tunisia. At the second level of analysis, the table shows that from one decade to the next, some countries have made progress while others have experienced a decline. From the decade 2000-2009 to the decade 2010-2019, countries such as Comoros, Gabon, Kenya, and Rwanda have, for example, recorded an average improvement of more than 10% in the rate of formal wage employment of women in work, which reflects a good policy of promoting women in job in these countries.

Table 1: Descriptive statistics

COUNTRY	2000-2009	2010-2019	2000-2019	COUNTRY	2000-2009	2010-2019	2000-2019
South Africa	79,3	87,0	83,1	Madagascar	10,6	8,3	9,5
Algeria	67,4	74,2	70,8	Mali	8,1	10,6	9,3
Angola	21,4	14,5	17,9	Morocco	33,4	37,2	35,3
Benin	4,5	5,1	4,8	Maurice	84,4	84,7	84,6
Botswana	70,7	71,8	71,2	Mauritania	24,3	26,2	25,3
Burkina Faso	3,5	9,1	6,3	Mozambique	3,5	5,6	4,6
Burundi	14,6	11,5	13,0	Namibia	54,7	58,3	56,5
Cameroon	9,3	13,9	11,6	Niger	8,9	4,3	6,6
Comoros	18,4	29,1	23,7	Nigeria	9,6	13,3	11,4
Congo, DRC	4,2	9,3	6,7	Uganda	8,5	14,8	11,6
Congo	7,8	9,2	8,5	Central African Republic	4,2	3,6	3,9
Egypt	54,7	57,9	56,3	Rwanda	9,1	20,5	14,8
Eswatini	64,0	59,6	61,8	Senegal	16,9	25,6	21,3
Gabon	51,5	62,3	56,9	Sierra Leone	3,5	4,2	3,8
Gambia	12,5	15,9	14,2	Sudan	30,8	33,8	32,3
Ghana	9,6	15,9	12,7	Tanzania	5,0	9,5	7,3
Guinea	2,6	2,3	2,5	Chad	1,3	1,5	1,4
Guinea-Bissau	17,1	17,7	17,4	Togo	6,1	8,9	7,5
Kenya	22,3	36,5	29,4	Tunisia	73,5	82,3	77,9
Libya	67,0	65,5	66,2	Ivory Coast	7,2	13,7	10,4

Source: World Bank data, authors' calculation

Some descriptive statistics on the variables studied are presented in Table 4. Table 5 in the appendix presents the correlation matrix between the variables looked at and shows that the labor force, gross fixed capital formation, and the CPI are significantly correlated with GDP per capita. Similarly, the variable wage and salaried workers, female (% of female employment) (TSF) is positively and significantly correlated with GDP per capita (0.79).

The scatter plots in Figure 1 and 2 show a probable relationship between the variable Wage and salaried workers, female (% of female employment), and GDP per capita on the one hand and between the human development index and GDP per capita on the other. The analysis in Figure 1 shows that countries with a high level of female participation in formal employment have a higher level of development. Figure 2 shows that the higher a country's HDI, the higher it is level of development. However, we conducted a multivariate analysis in an econometric framework to situate the relationships better.

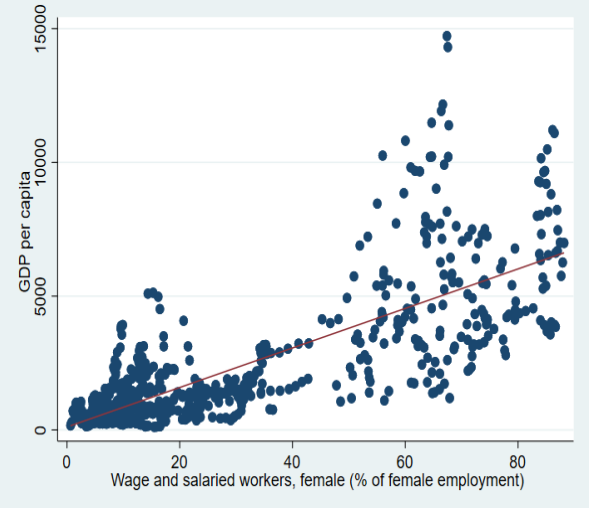

Figure 1: GDP per capita and wage and salaried workers, female (% of female employment); Source: Authors' representation

Figure 2: GDP per capita and Human Development Index, Source: authors' representation

Causal link

The idea of testing for causality in econometric models goes back to the work of Granger (1969). It is based on the idea that if one variable X causes another variable Y, adding the lagged variable of X in a regression of Y on its own lagged values and other explanatory variables should significantly improve the predictive power of the model[13]. The value of performing this test in panel data comes from the fact that the availability of a large amount of data improves the properties of the test statistics, especially in the case of a small time dimension sample[59]. The causality test we use in this paper is inspired by the work of Dumitrescu and Hurlin (2012) and Aye et al. (2017). This test accounts for potential heterogeneity across countries. The basic specification of the Dumitrescu and Hurlin(2012) test is given by the model below, in which we consider two stationary variables, X and Y.

$$Y_{i,t} = \lambda_i + \sum_{k=1}^{K} \alpha_{1i}^{(k)} Y_{i,t-k} + \sum_{k=1}^{K} \beta_{1i}^{(k)} X_{i,t-k} + \varepsilon_{1i,t} \qquad i = 1, \ldots, N; t = 1, \ldots, T$$

Under the null hypothesis of homogeneous non-causality, there is no causality from X to Y for all the crossover units in the panel.

$$H_0: \beta_i = 0 \quad \forall\ i = 1, \ldots, N$$

The alternative hypothesis assumes the existence of causality from X to Y for at least one country.

$$H_1: \beta_i = 0 \quad \forall\ i = 1, \ldots, N_1$$

$$\beta_i \neq 0 \quad \forall\ i = N_1, \ldots, N$$

The null and alternative hypothesis of causality from y to x is specified in the same way. To test these hypotheses, Dumitrescu and Hurlin (2012) propose a procedure that involves running the N individual regressions of the model and performing F-tests of the K linear hypotheses $\beta_{i1} = \ldots = \beta_{iK} = 0$ to recover the individual Wald statistic W_i and finally to compute the average Wald statistic $\underline{W}$:

$$\underline{W}_{NT} = \frac{1}{N}\sum_{i=1}^{N} W_{iT}$$

where W_{iT} is the individual Wald statistics for the Granger causality test. Assuming that the statistics W_{iT} are independent and identically distributed, we calculate a standardized statistic, Z-bar:

$$\underline{Z} = \sqrt{\frac{N}{2K}}\ (\underline{W} - K) \underset{T,N \to \infty \to}{\overset{d}{}} N(0,\ 1)$$

The Panel Model

To examine the effect of an increase in the female participation rate in formal wage employment on GDP per capita, we assume a Cobb-Douglas production model whose panel data specification is given by $Y_{it} = A_o K_{it}^{\alpha} L_{it}^{\beta}$

$$PIBh_{it} = f_{it}(POPAc,\ FBCF,\ IPC, TSF, OUV, IDH) + u_{it}$$

$PIBh_{it}$ is the dependent variable of the model and $PPOPAc,\ FBCF,\ IPC,\ TSF,\ OUV,\ IDH$ are the explanatory variables of the model and ε_{it} the error term. The linear form of this model is:

$$lnPIBh_{it} = \beta_0 + \beta_1 lnPOPAc_{it} + \beta_2 lnFBCF_{it} + \beta_3 lnIPC_{it} + \beta_4 ln\,TSF_{it} + \beta_5 lnOUV_{it} + \beta_6 IDH_{it} + u_{it}$$

Where β_0 is the constancy and β_1, β_2, β_3, β_4, β_5, β_6 are parameters to be estimated.

Hasciao test of Homogeneity of the parameters

The preliminary test for any estimation using panel data is the Hasciao test, which ensures that the parameters to be estimated are homogeneous for all countries. The results of this test (see table 6) confirm the hypothesis of homogeneity between the parameters.

In this study, the time dimension is less than 30 for each country, which does not allow us to test specific hypotheses, such as the stationarity test of the series. The individual size (N) is equal to 40, while the time dimension (T) is equal to 20. Moreover, the first-order lag (GDP(-1)) of GDP per capita (explained variable) is significantly correlated with GDP, which points to a dynamic GMM model.

GMM Model

The estimation procedure adopted in this paper was inspired by the work of Lawin et al. (2022). We specified the empirical model in the following form:

$$lnPIBh_{it} = \beta_0 + \beta_1 lnPOPAc_{it} + \beta_2 lnFBCF_{it} + \beta_3 lnIPC_{it} + \beta_4 ln\,TSF_{it} + \beta_5 lnOUV_{it} + \beta_6 lnPIBh_{it-1} + \beta_7 IDH_{it} + u_{it}$$

In this specification, $PIBh$ is the GDP per capita label; $FBCF$ is the gross fixed capital formation; POPAc indicates the labor force; IPC is the consumer price index; OUV is the degree of trade openness; and $TSF$is wage and salaried workers, female (% of female employment). $u_{it} = \mu_i + \nu_{it}$ with μ_i is the country-specific constant term that captures unmeasured heterogeneity, and ν_{it} is the error term, i = 1,2, ..., N is the country, t = 1,2, to T, is the time and β_0 is the constancy, and β_1, β_2, β_3, β_4, β_5 β_6; β_7 are parameters to be estimated.

Because of the inclusion of a lagged dependent variable in the right-hand side of the equation, some econometric issues need to be considered for a reasonables estimation of the model. The error term includes unobserved and time-invariant characteristics (fixed effects) of countries and thus is most likely correlated with the regressors. Note that $PIBh$ and its first-order lag depend on μi, and thus $PIBh_{i(t-1)}$ is necessarily associated with u_{it}. The dynamic GMM model used in this paper provides a better property of the estimators and other advantages. The GMM accounts for variable omission bias which are considered important determinants of growth and are correlated with some explanatory variables but may be omitted in the regression model. For more details on these advantages, see Lawin (2022).

The GMM technique comes in two versions: the difference GMM, where lagged levels of the explanatory variables are used as instruments, and the GMM systems, where a combination of difference and level regression is used. Bond et al. (2001) recommended that the GMM system estimator developed by Arellano et al. (1995) and Blundell et al. (1998) can significantly improve the efficiency and avoid the problem of weak instruments in the GMM estimator in the first place. Windmeijer (2005) showed from Monte Carlo simulations that the estimated asymptotic standard deviations of the two-stage GMM estimator could be biased in a finite sample. the correction procedure proposed by Windmeijer (2005). The consistency of the GMM estimator depends on two things: the validity of the assumption that the error term is not serially correlated (AR (2)) and the fact of the instruments (Hansen test). In what follows, we will use the GMM system estimator developed by Arellano et al. (1995) and Blundell et al. (1998) to estimate the parameters of our regression

The combined result of these methods leads to the results presented in the section below.

IV. RESULTS

The causality relationships between the explained variable and the explanatory variables are examined by the panel causality test of Dumitrescu et al. (2012). The results show the existence of a causal relationship between the labor force to GDP per capita on the one hand and investments (FBCE) to GDP per capita on the other hand. Indeed, the probabilities associated with the causality test are 0.0000 for the working population and 0.0057 for gross fixed capital formation, values that are well below 5%, the threshold considered. Similarly, there is a causal link between trade openness and GDP per capita on the one hand and between the consumer price index and GDP per capita on the other. Furthermore, the results show the existence of a causal relationship between the variable wage and salaried workers, female (% of female employment) to GDP per capita, with almost zero probability of being wrong (P-value = 0.0000). Estimation results show that the human development index (HDI) causes economic growth (GDP). These results imply that investment, labor force, inflation (consumer price index), trade openness, and wage and salaried workers, female (% of female employment), and the human development index have predictive

power or capacity on economic growth (GDP per capita) in African countries.

Table 2: Results of the Dumitrescu and Hurlin's (2012) panel causality test

	W-bar	Z-bar	p-value
POPAc does not Granger-cause PIBh	3.12	9.61	0.00
FBCF does not Granger-cause PIBh	1.61	2.76	0.001
ouv does not Granger-cause PIBh	3.26	10.23	0.00
TSF does not Granger-cause PIBh	2.19	5.42	0.00
IPC does not Granger-cause PIBh	8.11	9.31	0.00
IDH does not Granger-cause PIBh	5.71	21.09	0.00

Source: World Bank data, authors' calculations

Table 3: Result of the GMM model

LPIBh	Coef.	t.Err.	p-value	Sig
LPIBh(-1)	0.844	0.057	0.000	***
IDH	0.043	0.304	0.886	
LFBCF	0.086	0.043	0.048	**
LPOPAc	-0.079	0.047	0.096	*
LTSF	0.047	0.023	0.041	**
LOUV	0.067	0.033	0.041	**
LIPC	-0.062	0.029	0.031	**
Constant	0.347	0.234	0.138	
Arellano-Bond test for AR(1) in first differences: z = -2.76 Pr > z = 0.006				
Arellano-Bond test for AR(2) in first differences: z = -1.04 Pr > z = 0.297				
*** p<.01, ** p<.05, * p<.1				

Source: World Bank data, authors' calculations

The table analysis shows that gross fixed capital formation has a positive and significant effect on GDP per capita. This result confirms the results of numerous empirical studies involving economic growth and investment. Trade openness also has a positive and significant impact on GDP per capita. This result corroborates the findings of Baliamoune-Lutz et al. (2009; 2015) and Baliamoune-Lutz (2020), who showed that greater integration into the global market could result in higher growth but it would be associated with lower gender equality. Chen et al. (2013) also find that foreign participation, export orientation, female employment, and gender wage equality

London Journal of Research in Humanities and Social Sciences

within the same region and industry have a positive impact on growth. On the other hand, inflation reduces economic growth in African countries. The results show that the effect of the human development index is positive but not significant on economic growth. In addition, the variable wage and salaried workers, female (% of female employment), have a positive and significant effect on GDP. From the above, it is worth noting that a 10% increase in wage and salaried workers, female (% of female employment) increases GDP per capita by about 0.47%. In the same way, a 10% increase in the gross fixed capital formation and in the trade openness increases GDP per capita respectively by 0.86%, and 0.67%. Whereas, a 10% increase in the CPI decreases GDP per capita by 0.62%. Furthermore, the validation assumptions of the robustness of the model are verified. Indeed, the errors AR (2)) are not correlated, and the results of the Sargan and Hansen tests show a suitable property of the estimators.

V. DISCUSSION

This study examines the vital role or contribution of women employment in the development and wealth creation of African developing countries. The results of this study show that investments, by their positive and significant effects on the GDP per capita, are eminent for the development of African countries. This result contributes to the theoretical work of a link between production and capital stock or investments. It also confirms the empirical results of several authors, including Lin et al. (2018), Lawin (2020), Baneliene et al. (2020), Dinh et al. (2019), Asongu et al. (2020) and Acquah et al. (2020). The results show that investments are eminent for the development of African countries.

Our results also show that the parameter associated with the active population has a negative sign, reflecting its perverse effect on GDP per capita in the case of African countries. This result can be justified by the fact that an increase in the labor force that is not accompanied by an improvement in labor productivity should reduce the income per capita. Another possible explanation is that the majority of the labor force in African countries is underemployed or has precarious jobs that do not allow them to contribute fully to wealth production. e Other hand, regional integration is also essential in policies aimed at developing the African continent insofar as the variable of trade openness has a positive and significant effect on the GDP per capita of African countries. Its relative importance compared to investments is 72%. Thus, assets must be accompanied by regional integration to take advantage of comparative advantages, as specified by David Ricardo and Heckscher-Ohlin-Samuelson (HOS) in their theories of international trade.

Other hand, growth induced by investment and regional integration must be supported by moderate inflation. It was shown that an increase in the consumer price index reduces the GDP per capita.. A causal link was also established between the human development index (HDI) and the economic growth of African countries. However, the estimated parameter shows a positive and non-significant effect. This result can be explained on the one hand by the fact that massive investments are expected in the education and health sectors of African countries to improve human capital. On the other hand, academic and professional training is much more theoretical in most African universities, which does not allow students to be operational at the end of their training. It is important to emphasize that formal wage employment for women is necessary, especially in developing countries where poverty and misery still prevail. Working in the legal sector transcends relatively high wages to include other benefits such as job protection. Such jobs guarantee women social security, maternal and sick leave, training opportunities, and job mobility. Formal wage employment should increase women's income and thus of her household. That would create some space for investment in health and education, which in turn improves well-being, the productive capacity of the workforce, and economic growth.

VI. CONCLUSION AND RECOMMENDATION

This study examines the effect of promoting women's access to formal wage employment on

economic growth in African countries. It examines the impact of increasing women's access to formal wage employment on GDP per capita in African countries. To achieve this objective, we collected panel data from the World Bank database for 40 African countries from 2000-2019. We then examined the existence of a causal relationship between the explained variable and the explanatory variable based on the work of the panel causality test by Granger (1969) and Dumitrescu and Hurlin, (2012). The dynamic GMM model was used to estimate and examine the temporal dynamics and effects of the explanatory variables on the explained variable.

The results support a causal link between the labor force, investment (GFCF), consumer price index, human development index (HDI), trade openness, and women's access to formal wage employment to GDP per capita. The results of the econometric model showed that a 10% increase in the rate of women's access to formal wage employment increases GDP per capita by 0.47%; a 10% increase in the gross fixed capital formation increases GDP per capita by 0.86% and a 10% increase in trade openness increases GDP per capita by 0.67%. It also appears that inflation reduced economic growth in African countries. Indeed, a 10% increase in the consumer price index reduces GDP per capita by 0.62%.

From all the above, the recommendations for African countries are to make massive investments, and particularly in regional integration and to implement policies for the promotion of women in wage employment to have a sustainable and inclusive development. This last part can be done by putting in put legislative provisions facilitating women's access to the labor market.

Conflict of Interest Statement

The authors state that there is no conflict of interest.

Ethical Approval

The data used for the estimates do not include confidential information about individuals or animals that may raise ethical concerns.

Consent for Publication

The authors grant his consent for publication of this paper.

Funding

The writing of this paper has not been funded or sponsored. It was done by author's expense.

DATA AVAILABILITY STATEMENT

The data used in this paper is fully available and can be accessed upon request.

ACKNOWLEDGEMENT

We thank all those who have contributed to the improvement of the quality of this paper. to all the reviewers.

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APPENDIX

Tableau 4: Statistiques descriptives

Variable	Obs	Mean	Std. Dev.	Min	Max
PIBh	800	2109.957	2428.814	113.567	14721.869
POPAc	800	7994038.9	9805653.9	126872	62151626
FBCF	800	8.963e+09	1.604e+10	6974332	1.104e+11
TSF	800	26.762	26.054	.62	88.18
OUV	800	64.751	27.664	1.219	175.798
IPC	800	106.274	70.456	2.909	1344.193
IDH	800	0.503	0.122	0.252	0.804

Source: Données de la Banque mondiale, Calcul des auteurs

Table 5: Correlation matrix

Variables	(1)		(3)	(4)	(5)	(6)	(7)	(8)
(1) GDPh	1.000							
(2) L.PIBh	0.973*	1.000						
	(0.000)							
(3) CPI	0.091*	0.099*	1.000					
	(0.010)	(0.006)						
(4) HDI	0.801*	0.799*	0.174*	1.000				
	(0.000)	(0.000)	(0.000)					
(5) GFCF	0.318*	0.314*	0.188*	0.424*	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)				
(6) POPAc	-0.088*	-0.089*	0.133*	0.070*	0.687*	1.000		
	(0.013)	(0.014)	(0.000)	(0.047)	(0.000)			
(7) TFS	0.791*	0.789*	0.053	0.845*	0.356*	-0.065	1.000	
	(0.000)	(0.000)	(0.132)	(0.000)	(0.000)	(0.068)		
(8) OUV	0.402*	0.393*	-0.146*	0.391*	-0.136*	-0.316*	0.357*	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
*** p<0.01, ** p<0.05, * p<0.1								

Source: World Bank data, authors' calculations

Table 6: Hasciao test of Homogeneity of the parameters

	F1	F2	F3
Value	45.175589	41.682236	4.4194295
P-value	0.000	0.000	0.000

Source: World Bank data, authors' calculations