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Banking concentration, information sharing and women's political empowerment in developing countries

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Banking concentration, information sharing and women's political empowerment in developing countries**Simplice A. Asongu, Emeride F. Kayo, Vanessa S. Tchamyou & Therese E. Zogo****Abstract**

Purpose – This article analyses the effect of bank concentration on women's political empowerment in 80 developing countries over the period 2004-2020.

Design/methodology/approach – Banking concentration (BC) is measured by the assets held by the three largest commercial banks as a percentage of total commercial bank assets in a country. We use several indices to measure political empowerment, namely: the political empowerment index, composed of three indices (i.e., the women's civil liberties index, the women's participation in civil society index and the women's political participation index). The empirical evidence is based on the Ordinary Least Squares (OLS) and Fixed Effects (FE) techniques.

Findings – The following findings are established. Banking concentration reduces women's political empowerment. Furthermore, information sharing offices (i.e. public credit registries and private credit bureaus) mitigate the negative effect of bank concentration on women's political empowerment. Information sharing thresholds that are needed to completely dampen the negative effect of bank concentration on women's political empowerment are provided. Policy implications are discussed, notably: (i) that governments in developing countries increase competition by easing barriers to entry for potential banks, to facilitate the transition from confiscatory concentration to distributive concentration favorable to all stakeholders; and (ii) information sharing offices should be consolidated beyond the established thresholds in order to completely crowd-out the unfavorable effect of bank concentration on women's political empowerment.

Originality/value – The paper provides new empirical evidence that helps to advance the debate on the effects of banking concentration and information sharing in the banking sector on women's political empowerment in developing countries.

Key words: Banking concentration; women political empowerment; OLS; Fixed Effects.

1. Introduction

Women's empowerment has received increasing scientific attention in recent decades as a means of improving mobility, health, economic status and women's involvement in decision-making (Afrin et al., 2008). In addition, the sustainable development agenda identifies gender disparities and women's empowerment as key elements in expanding women's opportunities and closing the gender gap. Authors such as, Fayyaz and Kamal (2014) have divided women's empowerment into three categories: economic, social and political. In our study, we will focus on political empowerment. According to Sundström et al. (2017), women's political empowerment refers to women's capacity for free expression, their involvement in decision-making and the societal existence of an agency relationship.

In the literature, several authors have shown that when women gain political power, they are more likely to prioritize policies that benefit other women, such as health care and schooling. In fact, women with access to bank accounts, savings facilities and other financial services have greater control over their income and cover their personal and productive expenses (Islam et al., 2014; Ashraf & Yin, 2010; Kamaluddeen, 2019; Tchamyou et al., 2023). They can also make more choices about how they spend their time, whether in employment, leisure, income-generating activities or education (Aker et al., 2016; Chant, 2016; Asongu & Odhiambo, 2018). They may have greater autonomy in their lives when it comes to decisions about employment, marriage or whether or not to use contraception (Aker et al, 2016; Asongu & Odhiambo, 2023). They may be able to make better choices about where and how to work (Field et al., 2016), to increase their productivity and income and reduce their poverty (Jack et al., 2016). In addition, a study by Verba, Schlozman and Brady (1997) showed that women's political participation can lead to greater representation of their interests in decision-making processes and can also increase the visibility and legitimacy of women's issues.

Despite the many benefits that empowerment can bring to women, developing countries are still lagging behind. In fact, women rarely participate in political affairs (Sangaret, 2020; Nchofoung et al., 2023); although in some countries, such as Senegal, the situation has begun to change in recent years with a significant increase in female representation (Gueye, 2013). According to the World Economic Forum (2020), in 2019, the global gap in women's political empowerment was 75.3%, while the gap in economic participation was 42.2%. For health and education, the gaps were 4.3% and 3.9% respectively. In developing countries, women's political empowerment is still a long way from global targets. Regional performance shows that the Middle East and North Africa region is the worst performer, with an overall score of 10.2%.

This is followed by Eastern Europe and Central Asia, representing 15.0%; East Asia and the Pacific 15.9%; Sub-Saharan Africa 21.1%; Latin America and the Caribbean 26.9%; and finally South Asia, ranking among the developing regions with an overall score of 38.7%. Furthermore, almost 130 years after women first gained the right to vote in nation-states, women make-up less than 20% of members of legislatures (Phillips et al., 2012; Song, 2013). Given the above, we note the low level of political empowerment of women in developing countries.

This article draws on two areas of economic literature. The first part focuses on little-explored determinants of women's political empowerment, namely: natural resources (Camargo & Gala, 2017), religion (Gonda & Potrope, 2016), trade openness (Batalgi et al., 2009), economic growth (Ross, 2008), political awareness (Beneria & Bisnath, 2001) and age (Jejeebhay, 2000). The second part of the abundant literature relates to the role of banking concentration on the performance of economies (Diagne, 2010; Nguyen, 2011; Ouédraogo, 2011; Abuka et al., 2018; Avom et al., 2021).

To our knowledge, most existing studies in the literature focus on the economic effects of bank concentration on the one hand and the determinants of women's political empowerment on the other, thus neglecting the relationship that might exist between bank concentration and women's political empowerment. This study differs from the latter in a number of ways, including the size of the study sample, which covers up to 80 developing countries, allowing us to observe a greater degree of freedom in our results and claim general recommendations for the whole region. Moreover, we analyse the correlation between bank concentration and women's political empowerment and discuss the theoretical links of this plausible correlation. Moreover, having assessed this correlation empirically, we test it using a sensitivity test, based in particular on the addition of a variable to the model. The study also assesses how information sharing offices (i.e., private credit bureaus and public credit registries) moderate the incidence of bank concentration on the political empowerment of women.

In the light of the above, this article makes two contributions to the existing literature. First, it provides new empirical evidence that helps to advance the debate on the effects of concentration in the banking sector. Second, in our empirical analysis we perform sensitivity tests. Furthermore, given the endogeneity bias that may exist in most studies conducted in developing countries (i.e., omitted variable bias and unobserved heterogeneity) (Mallah & Asongu, 2022), this study provides a solid basis for policy making. Furthermore, the study also endeavours to assess how information sharing offices within the remit of public credit registries and private

credit bureaus can moderate the effect of bank concentration on the political empowerment of women.

The remainder of the paper is organised as follows: Section 2 provides a brief review of the literature. Section 3 discloses the methodology and data. Section 4 presents and analyses the results obtained and section 5 concludes the study.

2. Literature review

2.1 Theoretical underpinning

The theoretical underpinnings linking bank concentration, information sharing and gender political empowerment are consistent with extant contemporary literature on the linkages between financial inclusion and gender political empowerment (Nchofoung et al., 2014a) and the nexus between information sharing offices and market power. First, Nchofoung et al. (2024a) have used the theory of financial inclusion beneficiary in establishing the nexus between financial inclusion and women political empowerment while Boateng et al. (2018) have used the theory of information asymmetry on the nexus between information sharing and market power. Both theories are relevant to the present study because information sharing offices (i.e., asymmetric information theory) are used to mitigate the negative effect bank concentration (i.e., market power) on gender political empowerment, not least, because in accordance with the theory of financial inclusion, gender access to finance provides opportunities with which to fund and achieve inclusive development outcomes, which include, gender political inclusion. The two theories are substantiated in what follows.

First, the underpinning of financial inclusion beneficiary serves as the basic theoretical foundation for this investigation. The public goods theory of financial inclusion emphasizes that financial services ought to be viewed as a public benefit in this regard, where people's access to and use of these financial services should not be restricted. As a result, the financial institution under consideration should be able to cover the costs associated with opening an account, saving, withdrawing money, and utilizing extant financial services and infrastructure (Ozili, 2020). As a public good, everyone has access to and is free to utilize the attendant services, regardless of age, gender, or ethnicity ((Nchofoung et al., 2014a) .

Second, it is argued that credit information sharing reduces asymmetric information dynamics (i.e., moral hazard and adverse selection), raises borrower discipline, fosters competition, and thereby reduces bank concentration or market power. This argument is consistent with Boateng et al. (2018) and their theory of information asymmetry. For instance, according to academics

like Bennardo et al. (2015), credit information sharing eliminates information gaps across banks, enabling them to provide better lending decisions to all of their borrowers. Better information therefore results in increased lending and decreased default rates. Similar research by Karapetyan and Stacescu (2014) has provided some support for the preceding finding, suggesting that because all lenders have access to information concerning defaults, borrowers are more likely to repay their obligations.

In the light of the above, we expect bank concentration which is a proxy for market power to theoretically have a negative effect of gender inclusion. This is consistent with the underpinnings of the financial inclusion theory, especially as applied with in recent literature (Nchofoung et al., 2024a). Moreover, information sharing offices employed as moderating variables should mitigate the potentially negative effect on bank concentration on gender inclusion (i.e., theory of reducing asymmetric information with information sharing offices) (Boateng et al., 2018).

2.2 Empirical literature

Several factors have been put forward to explain the determinants of women's political empowerment. For example, research by Malhotra and Mather (1997) argues that education can also help to challenge traditional gender roles and stereotypes and can promote greater gender equality and social justice. Hussain and Jullandhry (2020) argue that investing in women's education increases women's economic and political participation. Nikouline (2016) concludes that the use of ICTs has a positive effect on women's political empowerment (WPE). In the same vein Asongu and Odhiambo (2020) found that information and communication technologies significantly increase women's economic empowerment (WEE) through opportunities for participation in public affairs and for the defence of women's rights. Kjejeçaslan and Töngür (2019) found that low internet adoption reduces political empowerment due to inactivity and gender disparities, cybercrime and limits access to information. According to Ross (2008), higher income on women's wages encourages women's participation in politics, while unearned household income discourages women's participation in politics. According to Sumstron et al. (2017), financial inclusion has a positive impact on women's political empowerment. Industrialisation has promoted women's participation in new employment opportunities and thus, increased their political power (Greenstein & Anderson, 2017; Ross, 2008).

Some authors have also analysed the economic effects of bank concentration. According to Van Hoose (2010), an increase in the concentration ratio (by 10%) is associated with a rise in lending rates (from 0.1 to 11 basis points), a fall in deposit rates (from 0.1 to 18 basis points) and an increase in the supply of credit and bank profits (1.5 to 9% increase in net banking income). Several recent studies support a positive correlation between bank concentration and bank profits in the United States (Tregenna, 2009). However, Brewer and Jackson (2006) show that the effects of concentration on deposit remuneration are half as important when the effect of bank risk is isolated. Ouédraogo (2011) provides a related result showing that bank concentration as measured by the Herfindahl-Hirschman index (HHI) index constrains the financing of the economy. In the same vein, Abuka et al. (2019) in the context of Asian countries indicate that bank concentration measured by the HHI reduces the supply of credit by banks even if the authors indicate that this effect is weak in the context of the economies in question. Avom et al. (2021) argue that bank concentration reduces access to credit and therefore financial inclusion in Africa. Shi and Mao (2014) use a probit model to assess the impact of bank concentration on firms' access to finance. The authors find that firms face fewer financing constraints when the banking market is more concentrated. Chauvet and Jacolin (2017) find that less concentration and more competition in the banking market have a positive impact on financial inclusion and firm performance. Banking concentration therefore has a negative effect on financial inclusion. Ajidé (2019) found that banking concentration limits the development of the financial sector in Nigeria. Conversely, the work of Ayalew and Xianzhi (2019) on a sample of 27 African countries suggests that bank competition exacerbates credit/financing constraints.

3.Data and methodology

3.1 Data

This paper studies 80 developing countries with data from the Financial Development and Structure Dataset (FDSD), Varieties of Democracy (V-Dem) and World Development Indicators (WDI) over the period 2004-2020¹. The focus on developing countries is consistent

¹ The sampled countries are: South Africa; Cameroon; Mauritania; Romania; Albania; Benin; Mexico; Rwanda; Argentina; Burundi; Mongolia; Senegal; Armenia; Cambodia; Mongolia; Seychelles; Belize; Colombia; Montenegro; Tajikistan; Botswana; Cote d'Ivoire; Mozambique; Tanzania; Brazil; Djibouti; Nepal; Chad; Burina Faso; Tunisia; Jamaica; Nicaragua; Cape Verde; Estonia; Oman; Tunisia; Chile; Ecuador; Nigeria; Togo; China; Egypt; Niger; Thailand; Ethiopia; Eswatini; Uganda; Ukraine; Georgia; Iran; Pakistan; Venezuela; Ghana; Iraq; Paraguay; Saudi Arabia; Guatemala; Kuwait; Peru; Barhain; India; Lesotho; Philippines; Chile; Indonesia; Madagascar; Qatar; Bolivia; Morocco; Afghanistan; Costa-Rica; Serbia; Kenya; Mongolia; Guatemala; Senegal; Moldova; Bangladesh; Kazakhstan and Vietnam. The choice of the developing countries which is

with the facts stylised in the motivation, notably: the gender gap in legislatures and the paucity of literature on the link between banking concentration and women's political empowerment.

In line with the recent literature on bank concentration (Avom et al., 2021), bank concentration is measured by the assets held by the three largest commercial banks as a percentage of total commercial bank assets in a country.

Four measures of women's political empowerment are used: Women's Political Empowerment Index, itself composed of three indices namely: women's civil liberties index; women's civil society participation index and women's political participation index. The use of these indicators is consistent with extant literature on female political empowerment (Asongu et al., 2022; Nchofoung et al., 2024b).

Five control variables are used to account for variable omission bias, namely: GDP growth, natural resources, inflation, education and trade openness. The choice of these variables is consistent with the literature on women's political empowerment (Ross, 2008; Camargo & Gala, 2017; Greenstein & Anderson, 2017; Meghna Dutta, 2018; Awoa et al., 2022). After a pilot investigation, it is clear that taking into account more than five control variables leads to a multiplication of instruments: the number of effective sections is lower than the number of corresponding instruments in the specification of the Generalized Moment Method.

As far as the expected signs are concerned, from a theoretical point of view, higher income on women's wages encourages women's participation in the labour market, while unearned household income discourages women's participation in the labour market and politics (Ross, 2008). Unearned household income discourages women's participation in work and politics (Ross, 2008). The expected sign is therefore positive. The total resource rent per capita has a strong negative impact on women's overall political empowerment (Awoa et al., 2022). High inflation affects women more severely, particularly those from disadvantaged groups, by limiting their economic power, which in turn hampers their political involvement (Diana Deere, 2012). The expected sign is therefore negative. The last variable taken into account is trade openness. Indeed, trade openness can have negative effects on women's rights and political

constrained by the availability of data at the time of the study is consistent with the World Bank's definition of developing countries, which entail, low and lower middle-income countries.

<https://www.aslo.org/palma-2023/world-bank-developing-countries/>

participation in developing countries (Asongu & Odhiambo, 2023). The definition of the variables and summary statistics are provided in Appendix 1.

3.2 Methodology

The ordinary least squares specification in equation (1) is as follows:

$$WPEI_{it} = \alpha + \beta BC_{it} + \delta X_{it} + \mu_i + \gamma_t + \varepsilon_{it}$$

$WPEI_{it}$ represents women's political empowerment, β is the parameter to estimate, BC_{it} is bank concentration, δ is the vector of parameters, X_{it} the vector of control variables, μ_i and γ_t are respectively, the country fixed effect and the time fixed effect, ε_{it} the error term.

4. Empirical results

4.1 Baseline ordinary least squares (OLS) results

Appendix 2 discloses the correlation matrix while Table 1 presents the baseline ordinary least squares results (OLS). The use of OLS to provide baseline results is consistent with the extant literature (Ebersberger & Herstad, 2013). The following findings are established. Bank concentration has a negative and significant effect on women's political empowerment at the 1% level. This result is the same for the different indices of women's political empowerment. A one-point increase in bank concentration leads to a 0.000738 decrease in women's political empowerment. Similarly, a one-point increase in banking concentration leads to a decrease of 0.000656, 0.00109, 0.00114 respectively, in the index of women's participation in civil society, the index of women's political participation and the index of women's civil liberties. These findings show that when market power in terms of bank concentration increases, women are provided with less opportunities by which to fund their politico-economic prospects, in line with the theoretical and empirical literature discussed in the Section 2. Accordingly, increasing market power in the banking industry has been documented to push banks to increase their profit margins instead of leveraging on such power to improve financial access for inclusive development outcomes such as gender political and economic inclusion (Asongu & Biekpe, 2018).

With regard to the control variables, we note the positive and significant effect of education on women's political empowerment. This result can be explained by the fact that education makes

it possible to confront the traditional role of women, to improve their ability to join the labour market and to improve their ability to join the world of politics (Birdsall & Grifn, 1988).

There is also the significant negative effect of inflation. Inflation can increase gender inequalities by disproportionately affecting women who depend on fixed incomes and by reducing their access to economic resources (Naila Kabeer, 2013). This will therefore have a negative effect on women's political empowerment as they will be unable to finance their political campaigns, for example.

It is also important to note the significant negative effect of trade openness on banking concentration. This result can be explained by the fact that trade opening can reinforce gender inequalities due to labour market segmentation and discrimination, which limits women's political participation.

“Insert Table 1 here”

Table 2 shows the results of the sensitivity analysis with the addition of the control variables. In line with the basic conclusions, the results in the same direction.

“Insert Table 2 here”

4.2 Information sharing offices and women’s political empowerment

Contemporary literature insinuates that information sharing offices should theoretically promote financial access by optimising financial sector development (Triki & Gajigo, 2014; Asongu et al., 2015; Tchamyu et al., 2018). Moreover, information sharing bureaus are essential for credit growth in any economy, as they overcome some information asymmetries that prevent lenders from investigating risk profiles (Asongu & Odhiambo, 2019). Access to credit will therefore have a positive effect on the political empowerment of women.

The aim of this section is to assess how information sharing offices directly affect women’s political empowerment. The employment of information sharing offices within the remit of public credit registries and private credit bureaus is consistent with the extant information sharing literature (Tchamyu & Asongu, 2017; Boateng et al., 2018). While Panel A of Table 3 shows findings on the nexus between private credit bureaus and women’s political empowerment, Panel B of Table 3 displays findings relevant to the linkage between public credit registries and women’s political empowerment. The findings from both tables show that

information sharing offices consistently improve women's political empowerment. The findings motivate the intuition that information sharing offices can be used to mitigate the negative incidence of bank concentration on women's political empowerment, established in the previous section. Hence, an extended analysis within the framework of interactive regressions is considered in the section that follows.

“Insert Table 3 here”

4.3 Extended analysis on how information sharing offices mitigate the effect of bank concentration on women's political empowerment

Our aim in this section is to analyse the interaction between bank concentration, information sharing offices and women's empowerment. This is to assess at what threshold information sharing offices mitigate the negative effect of bank concentration on women's political empowerment. It is important to recall that, previously we have shown that bank concentration (information sharing offices) reduces (promote) women's political empowerment. It follows that within the remit of interactive regressions, it is both intuitive and theoretically sound to assess how information sharing offices can potentially mitigate the negative role of bank concentration in women's political empowerment.

In the light of the above, in Tables 4 and 5, we have analysed the interaction between bank concentration, private credit bureaus, public credit registries and women's political empowerment. In Table 4, we find a positive effect of bank concentration×private credit bureaus on women's political empowerment. This means that information sharing offices mitigated the negative effect of bank concentration on women's political empowerment. The different private credit bureaus thresholds are as follows: -2.5917 (% of adults), -2.5229 (% of adults), -5.4381 (% of adults) and 1.4719 (% of adults) respectively, for Women's Political Empowerment Index (WPEI), Women's Civil Liberties Index (WCSPI), Women's Civil Liberties Index (WCLI), Women's Political Participation Index (WPPI).

The same result is observed for the public credit registry (Table 5) with the following private credit registries thresholds: -2.0763(% of adults), -1.7872(% of adults), -9.0573(% of adults), and 7.3123(% of adults) for Women's Political Empowerment Index (WPEI), Women's Civil Liberties Index (WCSPI), Women's Civil Liberties Index (WCLI), Women's Political participation index (WPPI) and Women's Political Participation Index (WPPI), respectively.

The information sharing thresholds are understood and computed as the absolute value of the unconditional effect of bank concentration divided by the conditional or interactive effect of

bank concentration. This approach to computing thresholds in order to avoid the pitfalls of interactive regressions documented in Brambor et al. (2006) is consistent with contemporary interactive regressions literature (Asongu & le Roux, 2023a, 2023b). Moreover, in order for the policy thresholds to make economic sense and have policy relevance, they should be situated between the minimum and maximum values of the policy, moderating or information sharing offices, provided in the summary statistics. This is actually the case because all the computed information sharing thresholds are within the critical ranges provided in the summary statistics for the attendant variables. In order words, the maximum values of public credit registries and private credit bureaus is 100 (% of adult) which is an indication that the computed thresholds make policy sense and have economic meaning.

“Insert Table 4 here”

“Insert Table 5 here”

In general, the results align with the theoretical framework, particularly concerning bank concentration as a proxy for market power's detrimental impact on gender inclusion. Consequently, the findings are in line with the underpinnings of the financial inclusion theory, particularly (Ozili, 2020; Nchofoung et al., 2024a). Additionally, the theory of reducing asymmetric information with information sharing offices is confirmed because information sharing offices mitigate the negative effect of bank concentration on gender inclusion when used as moderating variables (Karapetyan & Stacescu, 2014; Bennardo et al., 2015; Boateng et al., 2018).

5. Concluding implications and future research directions

5.1 Conclusion

This article has analysed the effect of bank concentration on women's political empowerment in 80 developing countries over the period 2004-2020. Banking concentration is measured by the assets held by the three largest commercial banks as a percentage of total commercial bank assets in a country while several indices are used to measure political empowerment, namely: the political empowerment index, composed of three indices (i.e., the women's civil liberties index, the women's participation in civil society index and the women's political participation index). The empirical evidence is based on the Ordinary Least Squares (OLS) and Fixed Effects (FE) techniques. The following findings are established. Banking concentration reduces women's political empowerment. Furthermore, information sharing offices (i.e., public credit

registries and private credit bureaus) mitigate the negative effect of bank concentration on women's political empowerment. Information sharing thresholds that are needed to completely dampen the negative effect of bank concentration on women's political empowerment are provided. Policy implications are discussed in what follows.

5.2 Implications and future research directions

First, consistent with the findings, governments in the sampled countries should increase competition in the banking industry by easing barriers to entry for potential banks, to facilitate the transition from confiscatory concentration to distributive concentration favorable to all stakeholders. Accordingly, in accordance in the extant studies, bank concentration is a proxy for market power (Asongu & Biekpe, 2018) and hence, competition can reduce market power in the banking sector in order to ultimately increase access to finance (Boateng et al., 2018) which has externalities in terms of women empowerment.

Second, information sharing offices should be consolidated in order to improve the potential of mitigating information asymmetry on women's empowerment. Accordingly, *ex-ante* (i.e., adverse selection) and *ex-post* (i.e., moral hazard) of the lending process, information sharing offices within the remit of public credit bureaus and private credit registries, play an important role of limiting market power by providing financial institutions with the necessary information to provide women with more financial access mechanisms that are worthwhile in improving their opportunities in both economic and political circles.

Third, the design of policies that are aimed at improving opportunities towards financial access and reduction of market competition should not be done in isolation. This is essentially because the information sharing offices should be consolidated beyond the established thresholds in order to completely crowd-out the unfavorable effect of bank concentration on women's political empowerment. Given that the computed information sharing thresholds are closer to the minimum limit compared to the corresponding maximum limit in the summary statistics, it follows that not much policy effort is required to reach the targeted policy thresholds established in the study as critical limits at which market power by means of bank concentration no longer unfavorable affects women's empowerment.

The findings in this study obviously allow space for future research, especially as it concerns understanding how bank concentration and information sharing offices affect other United Nations' sustainable development goals (SDGs). Furthermore, understanding how these are particularly relevant with the advent of the African Continental Free Trade Area (AfCFTA) will

also go a long to enhancing the understanding of how these interactions do not only influence women's political empowerment but also how they also influence the economic empowerment of women, especially within the remits of enhancing economic and political integration within and between nations. The fixed effects regressions used in this study address only the unobserved heterogeneity dimension of endogeneity, in addition to the variable omission bias and measurement error concerns. Hence, the simultaneity dimension which is not addressed should be considered in future studies, not least, because it is difficult for a single estimation technique to account for all the four dimensions of endogeneity.

Appendices

“Insert Appendix 1 here”

“Insert Appendix 2 here”

References

- Abuka Abebo, T., & Jember Tesfaye, D. (2018). Postnatal care utilization and associated factors among women of reproductive age Group in Halaba Kulito Town, Southern Ethiopia. *Archives of public health*, 76(1), 1-10.
- Abuka, C., Alinda, R. K., Minoiu, C., Peydró, J. L., & Presbitero, A. F. (2019). Monetary policy and bank lending in developing countries: Loan applications, rates, and real effects. *Journal of Development Economics*, 139, 185-202.
- Afrin, S., Islam, N., & Ahmed, S. (2008). A multivariate model of micro credit and rural women entrepreneurship development in Bangladesh. *International Journal of Business and Management*. 3(8), 169-185.
- Aker, J. C., Boumnijel, R., McClelland, A., & Tierney, N. (2016). Payment mechanisms and antipoverty programs: Evidence from a mobile money cash transfer experiment in Niger. *Economic Development and Cultural Change*, 65(1), 1-37.
- Asongu, S. A. (2015). Financial sector competition and knowledge economy: evidence from SSA and MENA countries. *Journal of the Knowledge Economy*, 6(4), 717-748.
- Asongu, S. A., & Biekpe, N. (2018). ICT, information asymmetry and market power in African banking industry. *Research in International Business and Finance*, 44, 518-531.

- Asongu, S. A., & le Roux, S. (2023a). The role of mobile money innovations in transforming unemployed women to self-employed women in sub-Saharan Africa. *Technological Forecasting and Social Change*, 191, 122548.
- Asongu, S. A., & le Roux, S. (2023b). The role of mobile money innovations in the effect of inequality on poverty and severity of poverty in Sub-Saharan Africa. *Information Systems Frontiers*, 1-15.
- Asongu, S. A., & Odhiambo, N. M. (2018). ICT, financial access and gender inclusion in the formal economic sector: evidence from Africa. *African Finance Journal*, 20(2), 45-65.
- Asongu, S. A., & Odhiambo, N. M. (2019). Testing the quiet life hypothesis in the African banking industry. *Journal of Industry, Competition and Trade*, 19, 69-82.
- Asongu, S. A., & Odhiambo, N. M. (2020). Foreign direct investment, information technology and economic growth dynamics in Sub-Saharan Africa. *Telecommunications Policy*, 44(1), 101838.
- Asongu, S. A., & Odhiambo, N. M. (2023, May). Economic sectors and globalization channels to gender economic inclusion in Sub-Saharan Africa. In *Women's Studies International Forum* (Vol. 98, p. 102729). Pergamon.
- Asongu, S. A., Messo, O. O., & Guttemberg, K. T. (2022). Women political empowerment and vulnerability to climate change: evidence from 169 countries. *Climatic Change*, 174(3-4), 30.
- Avom, D., Bangake, C., & Ndoya, H. (2022). Does bank concentration stem from financial inclusion in Africa?. *Applied Economics*, 54(28), 3261-3278.
- Awoa, P. A., Ondo, H. A., & Tabi, H. N. (2022). Women's political empowerment and natural resource curse in developing countries. *Resources Policy*, 75, 102442.
- Beneria, L., & Bisnath, S. (2001). *Gender and development: Theoretical, empirical and practical approaches*. Edward Elgar Publishing.
- Bennardo, A., Pagano, M., & Piccolo, S. (2015). Multiple-bank lending, creditor rights, and information sharing". *Review of Finance*, 19(2), pp.519-570.
- Boateng, A., Asongu, S., Akamavi, R., & Tchamyu, V. (2018). Information asymmetry and market power in the African banking industry. *Journal of Multinational Financial Management*, 44, 69-83.
- Brambor, T., Clark, W. M., & Golder, M. (2006). Understanding Interaction Models: Improving Empirical Analyses, *Political Analysis*, 14 (1), 63-82.
- Brewer III, E., & Jackson III, W. E. (2006). A note on the "risk-adjusted" price-concentration relationship in banking. *Journal of Banking & Finance*, 30(3), 1041-1054.

- Cédric, N. S., & Christel, M. E. L. A. (2020). Concentration bancaire et offre de crédit des banques: quels enseignements pour la zone CEMAC?. *Journal of Economics*, 8(1), 68-80.
- Chant, S. (2013). Cities through a “gender lens”: a golden “urban age” for women in the global South?. *Environment and urbanization*, 25(1), 9-29.
- Chant, S. (2016). Women, girls, and world poverty: empowerment, equality or essentialism?. *International Development Planning Review*, 38(1), 1-24.
- Chauvet, L., & Jacolin, L. (2017). Financial inclusion, bank concentration, and firm performance. *World Development*, 97, 1-13.
- Fayyaz, W., & Kamal, A. (2014). Role of Gender, Age, and Geographical Locality in Metacognitive Listening Skills of English as a Foreign Language. *Pakistan Journal of Psychological Research*, 29(2), 265–276.
- Diana Deere, C., Alvarado, G. E., & Twyman, J. (2012). Gender inequality in asset ownership in Latin America: Female owners vs household heads. *Development and Change*, 43(2), 505-530.
- Ebersberger, B., & Herstad, S. J. (2013). The relationship between international innovation collaboration, intramural R&D and SMEs’ innovation performance: a quantile regression approach. *Applied Economics Letters*, 20(7), 626-630.
- Field, E., Pande, R., Rigol, N., Schaner, S., & Moore, C. T. (2016). On her account: Can strengthening women’s financial control boost female labor supply?. *Growth and labour markets in low income countries programme: Working. Paper*, (32), 1-62.
- Greenstein, J., & Anderson, B. (2017). Premature deindustrialization and the defeminization of labor. *Journal of Economic Issues*, 51(2), 446-457.
- Jack, W., Kremer, M., De Laat, J., & Suri, T. (2016). *Borrowing requirements, credit access, and adverse selection: Evidence from kenya* (No. w22686). National Bureau of Economic Research.
- Jejeebhoy, S. J. (2002). Convergence and divergence in spouses' perspectives on women's autonomy in rural India. *Studies in family planning*, 33(4), 299-308.
- Jejeebhoy, S. J., & Sathar, Z. A. (2001). Women's autonomy in India and Pakistan: the influence of religion and region. *Population and Development Review*, 27(4), 687-712.
- Kamaluddeen, H. K. (2019). Effect of Microfinance Banks on Women Empowerment: Evidence from Kwara State, Nigeria (Doctoral dissertation, Kwara State University (Nigeria)).
- Karapetyan, A., & Stacescu, B., (2014). Information Sharing and Information Acquisition in Credit Markets. *Review of Finance*, 18(6), pp. 2247-2281.
- Kinkingninhoun-Médagbé, F. M., Diagne, A., Simtowe, F., Agboh-Noameshie, A. R., & Adégbola, P. Y. (2010). Gender discrimination and its impact on income, productivity, and technical efficiency: evidence from Benin. *Agriculture and human values*, 27, 57-69.

- Malah Kuete, Y. F. & Asongu, S. A. (2022). Infrastructure development as a prerequisite for structural change in Africa. *Journal of the Knowledge Economy*, pages 1-27
- Malhotra, A., & Mather, M. (1997, December). Do schooling and work empower women in developing countries? Gender and domestic decisions in Sri Lanka. In *Sociological forum* (Vol. 12, pp. 599-630). *Kluwer Academic Publishers-Plenum Publishers*.
- Nchofoung, T. N., Asongu, S. A., & Tchamyou, V. S. (2024a). Gender political inclusion and inclusive finance in Africa. *Economic Systems*, 101187.
- Nchofoung, T. N., Asongu, S. A., & Tchamyou, V. S. (2024b). Effect of women's political inclusion on the level of infrastructures in Africa. *Quality & Quantity*, 58(2), 1181-1202.
- Nchofoung, T., Asongu, S., Tchamyou, V., & Edoh, O. (2023). Gender, political inclusion, and democracy in Africa: Some empirical evidence. *Politics & Policy*, 51(1), 137-155.
- Nguyen, J. (2011). Market concentration and other determinants of bank profitability: evidence from panel data. *International Research Journal of Finance and Economics*, 70, 7-17.
- Ouédraogo, S. (2011). *Banques et transmission monétaire dans l'UEMOA: effets des bilans bancaires, de la concentration bancaire et de l'excès de liquidité bancaire sur l'efficacité de la politique monétaire de la BCEAO* (Doctoral dissertation, Université d'Auvergne-Clermont-Ferrand I). Pergamon.
- Ozili, P. K. (2020). Theories of financial inclusion. In *Uncertainty and challenges in contemporary economic behaviour* (pp. 89-115). Emerald Publishing Limited.
- Islam, M. R., Ahmed, S., Das, S. K., & Alam, T. M. F. (2014). Microcontroller based power pilferage detection system (Doctoral dissertation, BRAC University).
- Phillips, S., Haas, L. P., & Coverdill, J. E. (2012). Disentangling victim gender and capital punishment: The role of media. *Feminist Criminology*, 7(2), 130-145.
- Ross, M. L. (2008). Oil, Islam, and women. *American political science review*, 102(1), 107-123.
- Sundström, A., Paxton, P., Wang, Y. T., & Lindberg, S. I. (2017). Women's political empowerment: A new global index, 1900-2012. *World Development*, 94, 321-335.
- Tchamyou, V. S., & Asongu, S. A. (2017). Information sharing and financial sector development in Africa. *Journal of African Business*, 18(1), 24-49.
- Tchamyou, V. S., Asongu, S. A., & C. Nwachukwu, J. (2018). Effects of asymmetric information on market timing in the mutual fund industry. *International Journal of Managerial Finance*, 14(5), 542-557.

Tchamyou, V. S., Diop, S., Asongu, S. A., & Nnanna, J. (2023, January). African Women Vulnerability Index: Focus on Rural Women. In *Forum for Social Economics* (pp. 1-19). Routledge.

Torchyan, A. A. (2017, May). Asthma control in Saudi Arabia: Gender implications. In *Allergy & Asthma Proceedings* (Vol. 38, No. 3).

Tregenna, F. (2009). An empirical investigation of the effects of concentration on profitability among US banks. University Library of Munich, Germany.

Triki, T., & Gajigo, O. (2014). Credit bureaus and registries and access to finance: new evidence from 42 African countries. *Journal of African Development*, 16(2), 73-101.

van Duijkeren, E., Moleman, M., van Oldruitenborgh-Oosterbaan, M. S., Multem, J., Troelstra, A., Fluit, A. C., ... & Wagenaar, J. A. (2010). Methicillin-resistant *Staphylococcus aureus* in horses and horse personnel: an investigation of several outbreaks. *Veterinary microbiology*, 141(1-2), 96-102.

Verba, S., Burns, N., & Schlozman, K. L. (1997). Knowing and caring about politics: Gender and political engagement. *The journal of politics*, 59(4), 1051-1072.

Table 1: Banking concentration result and women's political empowerment (OLS)

Variables	(1) WCSPi	(2) WPPI	(3) WCLI	(4) WPEI
Bank concentration	-0.000656*** (0.000215)	-0.00109*** (0.000305)	-0.00114*** (0.000227)	-0.000738*** (0.000216)
Education	0.00104*** (0.000298)	0.00171*** (0.000420)	0.00110*** (0.000313)	0.000978*** (0.000298)
Natural resources	-0.000497 (0.000580)	-0.00159* (0.000825)	-0.000521 (0.000614)	-0.000911 (0.000586)
GDP	0.000416** (0.000650)	0.00102 (0.000917)	0.000767 (0.000683)	0.000177 (0.000651)
Inflation	-0.000447 (0.000398)	-0.00136** (0.000572)	-0.000173 (0.000426)	-0.000698* (0.000406)
Trade openness	-0.00113*** (0.000375)	-0.000752 (0.000531)	-0.00164*** (0.000395)	-0.000415 (0.000377)
Constant	0.617*** (0.0368)	0.748*** (0.0518)	0.688*** (0.0386)	0.738*** (0.0368)
Observations	1304	1285	1285	1285
R-squared	0.323	0.418	0.524	0.219
Number of countries	71	71	71	71
Fisher	6.82***	8.78***	11.13***	6.03***

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2 : Sensitivity analysis with the addition of control variables (OLS)

VARIABLES	(1) WPEI	(2) WCLI	(3) WCSPi	(4) WPPI
Bank concentration	-0.00115*** (0.000247)	-0.000558** (0.000232)	-0.000689*** (0.000226)	-0.000830*** (0.000322)
Education	0.00130*** (0.000322)	0.00124*** (0.000303)	0.00110*** (0.000297)	0.00210*** (0.000419)
Natural resources	-0.000152 (0.000651)	-0.000676 (0.000612)	0.000250 (0.000593)	-0.000144 (0.000847)
GDP	0.000218 (0.000766)	0.000255 (0.000720)	0.000939 (0.000706)	0.000956 (0.000997)
Inflation	-0.000107 (0.000497)	-0.000381 (0.000468)	-0.000645 (0.000448)	-0.00101 (0.000648)
Trade openness	-0.00134*** (0.000417)	-0.000760* (0.000392)	-0.00115*** (0.000384)	-0.000291 (0.000542)
Corruption	-0.0361*** (0.00603)	-0.00925 (0.00567)	-0.0175*** (0.00556)	-0.0528*** (0.00785)
Financial development	0.00114*** (0.000264)	0.000749*** (0.000248)	0.000382 (0.000242)	0.00261*** (0.000344)
Constant	0.639*** (0.0428)	0.680*** (0.0402)	0.594*** (0.0393)	0.634*** (0.0557)
Observations	1183	1183	1202	1183
R-squared	0.301	0.424	0.520	0.241
Number of countries	67	67	67	67
Fisher	15.55***	6.13***	7.71***	19.52***

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1. WPEI: Women's Political Empowerment Index. WCSPi: Women's Civil Liberties Index. WCLI: Women's Civil Liberties Index. WPPI: Women's Political Participation Index.

Table 3: Information sharing offices and women's political empowerment

Panel A: Private credit bureaus and women's political empowerment				
	WPEI	WCSPi	WCLI	WPPI
Private credit bureaus	0.00440*** (0.000414)	0.00229*** (0.000314)	0.000854*** (0.000290)	0.00151*** (0.000287)
Education	0.00131*** (0.000425)	0.000852*** (0.000322)	0.000980*** (0.000303)	0.000246* (0.000294)
Natural ressources	-0.000247 (0.000867)	-0.000305 (0.000657)	-0.000316 (0.000612)	0.000590 (0.000600)
Inflation	-0.000678 (0.000491)	-0.000159 (0.000372)	-0.000681** (0.000347)	-0.000620 (0.000340)
Trade openness	0.00161*** (0.000567)	0.00173*** (0.000429)	0.00124*** (0.000404)	0.00105 (0.000392)
GDPC	0.00199*** (0.000515)	0.000562 (0.000390)	0.000585 (0.000368)	0.000218** (0.000356)
Constant	0.606*** (0.0494)	0.575*** (0.0374)	0.518*** (0.0351)	0.846*** (0.0342)
Observations	830	832	760	782
R-squared within	0.149	0.083	0.401	0.280
Number of countries	63	63	63	63
Fisher	61.65***	106.22***	152.25***	77.54***
Panel B: Public credit registries and women's political empowerment				
	WPEI	WCSPi	WCLI	WPPI
Public credit registries	0.000966*** (0.000352)	0.00123** (0.000519)	-0.00116*** (0.000273)	0.00154*** (0.000347)
Education	0.00264*** (0.000374)	0.00480*** (0.000551)	-0.000121 (0.000290)	0.00156*** (0.000368)
Natural Ressources	0.000924 (0.000726)	0.000601 (0.00107)	0.000224 (0.000576)	0.000902 (0.000715)
Inflation	-0.000576 (0.000451)	-0.000599 (0.000666)	0.000445 (0.000359)	0.000105 (0.000445)
Trade openness	0.00103** (0.000469)	0.000950 (0.000691)	0.000500 (0.000378)	-0.000158 (0.000462)
GDP	0.0521*** (0.00714)	0.0588*** (0.0105)	0.0258*** (0.00578)	0.0717*** (0.00704)
Constant	0.655*** (0.0217)	0.671*** (0.0320)	0.684*** (0.0171)	0.888*** (0.0214)
Observations	806	806	819	806
R-squared within	0.153	0.153	0.056	0.165
Number of countries	64	64	64	64
Fisher	100.40***	44.26***	203.61***	61.44***

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1. WPEI: Women's Political Empowerment Index. WCSPi: Women's Civil Liberties Index. WCLI: Women's Civil Liberties Index. WPPI: Women's Political Participation Index.

Table 4 : Bank concentration, private credit bureaus – and women's political empowerment

	(1)	(2)	(3)	(4)
Variables	WPEI	WCSPi	WCLI	WPPI
C3	-0.000604** (0.000258)	-0.000371** (0.000287)	-0.000903*** (0.000275)	-0.000371** (0.000303)
Private credit bureaus	0.00138** (0.000548)	0.00129** (0.000511)	0.00126** (0.000491)	0.00182*** (0.000656)
C3×Private credit bureaus	2.33e-05*** (8.11e-06)	1.74e-05** (7.83e-06)	1.66e-05** (7.51e-06)	2.52e-05*** (9.70e-06)
Education	0.00144*** (0.000364)	0.00405 (0.000320)	0.00102*** (0.000307)	0.000749* (0.000413)
Natural Ressources	0.000100 (0.000632)	0.000292 (0.000694)	0.000781 (0.000666)	-0.000772 (0.000738)
Inflation	-0.000329 (0.000401)	-0.000108 (0.000415)	-0.000401 (0.000399)	-0.000390 (0.000471)
Trade openness	0.000149 (0.000424)	0.000152 (0.000488)	0.00203*** (0.000468)	-0.000320 (0.000507)
GDPC	0.0221*** (0.00625)	0.00203*** (0.000775)	0.000828 (0.000744)	0.0226*** (0.00748)
Constant	0.754*** (0.0269)	0.673*** (0.0288)	0.631*** (0.0276)	0.893*** (0.0313)
Observations	765	834	834	778
R-squared within	0.065	0.290	0.070	0.342
Number of id	64	67	67	64
Fisher	111.27***	120.51***	109.13***	90.86***

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1. WPEI: Women's Political Empowerment Index. WCSPi: Women's Civil Liberties Index. WCLI: Women's Civil Liberties Index. WPPI: Women's Political Participation Index.

Table 5: Bank concentration, public credit registries and women's political empowerment

	(1)	(2)	(3)	(4)
Variables	WPEI	WCSPi	WCLI	WPPI
C3	-0.000677** (0.000293)	-0.000883*** (0.000244)	-0.000356** (0.000288)	-0.000331** (0.000378)
Public credit registries	0.00363** (0.00142)	0.00255** (0.00121)	0.00465*** (0.00140)	0.00460** (0.00183)
C3×Public credit registries	3.26e-05* (1.77e-05)	4.94e-05*** (1.50e-05)	3.93e-05** (1.74e-05)	4.52e-05** (2.28e-05)
Education	0.00251*** (0.000410)	0.000169 (0.000328)	0.00182*** (0.000403)	0.00194*** (0.000529)
Natural Ressources	0.000961 (0.000714)	0.000285 (0.000593)	0.00101 (0.000703)	0.00191** (0.000922)
Inflation	-0.000370 (0.000452)	0.000461 (0.000377)	0.000403 (0.000445)	-0.000319 (0.000584)
Trade openness	0.00149*** (0.000480)	0.000524 (0.000406)	0.000391 (0.000472)	0.00117* (0.000620)
GDPC	0.0513*** (0.00711)	0.0251*** (0.00603)	0.0736*** (0.00700)	0.0251*** (0.00918)
Constant	0.689*** (0.0309)	0.618*** (0.0252)	0.885*** (0.0304)	0.839*** (0.0398)
Observations	765	778	765	765
R-squared within	0.176	0.080	0.202	0.062
Number of id	64	64	64	64
Fisher	101.39***	117.45***	60.58***	31.84***

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1. WPEI: Women's Political Empowerment Index. WCSPi: Women's Civil Liberties Index. WCLI: Women's Civil Liberties Index. WPPI: Women's Political Participation Index.

Appendix 1

Definitions of variables and summary statistics

Panel A: Definitions of variables		
Variables	Definitions	Data sources
Banking concentration	Bank concentration is measured by the assets held by the three largest commercial banks as a percentage of total commercial bank assets in a country	GFDD (2020)
Women's political empowerment	-Measured by the Women's Empowerment Index -Women's Civil Liberties Index (WCSPI) -Women's Political participation index (WPPI) -Women's Political Participation Index (WPPI)	V-dem (2021)
Natural resources	Measured by the benefits derived from natural resources in relation to GDP.	WDI (2021)
Inflation	Measured by the level of inflation in an economy.	WDI (2021)
Education	Measured by public spending on education.	WDI (2021)
Economic growth	Measured by the growth rate of GDP per capita. It	WDI (2021)
Trade openness	Measured by the sum of exports and imports of goods and services in relation to GDP	WDI (2021)
Information Asymmetry	- Public credit registry coverage (% of adults) - Private credit bureau coverage (% of adults)	WDI (2021)
Panel B : Descriptive Statistics		

Variables	Obs	Mean	Std. Dev.	Min	Max
WPEI	1556	.779	.241	0	1
WCSPI	1556	.761	.222	0	1
WCLI	1575	.72	.269	0	1
WPPI	1556	.937	.188	0	1
Public credit registries	1071	6.623	14.484	0	100
Private credit bureaus	1071	13.768	24.988	0	100
Bank concentration	1439	68.514	20.418	17.047	100
Education	1402	25.646	22.893	.269	117.113
Natural Resources	1557	8.177	10.572	0	58.92
Inflation	1540	7.187	9.717	-25.958	112.694
Trade openness	1479	40.083	20.773	8.234	191.458
GDP	1541	2.356	4.231	-19.127	27.831

Appendix 2: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)WPEI	1.000											
(2)WCSPi	0.866	1.000										
(3)WCLI	0.766	0.815	1.000									
(4)WPPI	0.682	0.660	0.522	1.000								
(5)Public credit registries	0.100	0.062	0.009	0.013	1.000							
(6)Private credit bureaus	0.031	0.011	0.085	0.046	-0.001	1.000						
(7)Bank concentration	-0.045	0.101	-0.099	-0.037	-0.003	-0.084	1.000					
(8)Education	0.028	0.048	0.034	-0.056	0.168	0.058	-0.184	1.000				
(9)Natural Resources	0.015	-0.006	0.013	0.050	-0.004	0.020	0.002	0.014	1.000			
(10)Inflation	-0.050	-0.046	-0.005	-0.062	-0.031	0.239	-0.013	0.110	0.122	1.000		
(11)Trade openness	0.097	0.156	0.189	0.143	-0.112	0.086	0.362	0.062	-0.099	-0.081	1.000	
(12)GDP	-0.010	-0.013	-0.031	-0.005	-0.041	0.013	-0.011	-0.007	-0.089	0.067	0.113	1.000