

Master's Programme in Economic Growth, Population and Development

Women's Economic Empowerment, Financial Inclusion, and Development in Sub-Saharan Africa

A Quantitative Micro and Macro-level Analysis on the *Process* and *Outcome* of
Women's Economic Empowerment

by

Karolin Heike Lehmann

karolin.h.lehmann@gmail.com

Abstract

Through econometric analysis, this thesis explores the relationship between Women's Economic Empowerment (WEE), financial inclusion and economic development in 30 sub-Saharan African countries, with a special focus on Benin, Cameroon, Nigeria and Guinea. WEE is defined as the women's ability to independently earn and control their income, seize economic opportunities and exercise their agency. Building on the conceptual WEE framework established by Kabeer (1999) and extended by Buvinic et al. (2020), this research aims to explore the role of financial services on the nexus between agency (the process of WEE) and economic achievement (the outcome of WEE). Using multiple sources including the World Bank's Global Financial Database and its Enterprise Survey as well as the USAID's Demographic Health Survey, estimations are made for macro and micro levels, establishing a multidimensional perspective on WEE. My findings suggest that on the micro-level, financial inclusion and economic achievement have a strong positive association. This relationship cannot be confirmed on a macro level, suggesting WEE may be limited to country-specific analysis. Even though the *process* and *outcome* of WEE do not directly affect economic development, they act through female health and private-sector employment.

Key words: *Women's Economic Empowerment, Agency, Financial Inclusion, Economic Development, sub-Saharan Africa*

Programme Code: EKHS21
Master's Thesis (15 ECTS)
June 2021
Supervisor: Jutta Bolt
Examiner: Tobias Karlsson
Word Count: 16 244

Acknowledgements

First and foremost, I like to thank my supervisor Jutta Bolt for the guidance and advice given throughout this writing process.

I further like to thank my thesis-combat-unit for the unyielding support and counsel. Writing this thesis would have been significantly less enjoyable without you. I specifically want to say thank you to Chandra, Hedvig, Joyce and Anthony for all the shared conversations and discussions.

Table of Contents

| | |
|---|-----------|
| 1. Introduction | 1 |
| 1.1 Research Problem | 2 |
| 1.2 Aim and Scope | 2 |
| 1.3 Outline | 3 |
| 2. Literature Review | 4 |
| 2.1 Female Empowerment for Development: Why does it matter? | 4 |
| 2.1.1 Female Empowerment in Sub-Saharan Africa | 7 |
| 2.2 Women’s Economic Empowerment | 8 |
| 2.2.1 A WEE Framework: Processes & Outcomes | 8 |
| 2.3 Gendered Financial Inclusion in Sub-Saharan Africa | 11 |
| 2.3.1 Financial Inclusion and WEE | 13 |
| 3. Analytical Concept | 16 |
| 4. Data: Quantifying WEE | 18 |
| 4.1 Stage One: WEE and Economic Development | 18 |
| 4.1.1 Variable Construction & Measurements | 19 |
| 4.1.2 Limitations and Issues | 21 |
| 4.2 Stage Two: WEE and Financial Inclusion on a Macro Level | 21 |
| 4.2.1 Variable Construction & Measurements | 23 |
| 4.2.2 Limitations and Issues | 24 |
| 4.3 Stage Three: WEE and Financial Inclusion on a Micro Level | 24 |
| 4.3.1 Variable Construction & Measurements | 25 |
| 4.3.2 Limitations and Issues | 27 |
| 5. Methodology & Empirical Strategy | 28 |
| 5.1 Stage One Model Equation | 28 |
| 5.2 Stage Two Model Equation | 29 |
| 5.3 Stage Three Model Equation | 30 |
| 5.4 Limitations of the Empirical Strategies | 32 |
| 6. Empirical Analysis | 33 |
| 6.1 Results | 34 |
| 6.1.1 Stage One: WEE and Economic Development | 34 |
| 6.1.2 Stage Two: WEE and Financial Inclusion on a Macro Level | 35 |
| 6.1.3 Stage Three: WEE and Financial Inclusion on a Micro Level | 37 |

| | |
|---|-----------|
| 6.2 Discussion | 41 |
| 7. Conclusion | 46 |
| 8. References | 48 |
| 9. Appendix | 57 |
| Appendix A: Descriptive Statistic & Variable Construction | 57 |
| Appendix B: Assumption Tests & Robustness Checks | 63 |
| Appendix C: Regression Outputs | 68 |

List of Figures

In-text

Figure 1) Adoption of the Women’s Economic Empowerment Framework by Buvinic et al. 9
(2020)

Figure 2) Average Mobile Money Account Ownership Average Account Ownership 12

Figure 3) Average Account Ownership 13

Appendix B

Graph 1) Stage 1: Kernel Density Estimation 62

Graph 2) Stage 1: Residual’s Normal Quantiles Plot 62

Graph 3) Stage 2: Kernel Density Estimation (DV: Female Business Ownership) 63

Graph 4) Stage 2: Residual’s Normal Quantiles Plot (DV: Female Business Ownership) 63

Graph 5) Stage 2: Kernel Density Estimation (DV: Female Workers) 64

Graph 6) Stage 2: Residual’s Normal Quantiles Plot (DV: Female Workers) 64

Graph 7) Stage 2: Kernel Density Estimation (DV: Female Business Managers) 65

Graph 8) Stage 2: Residual’s Normal Quantiles Plot (DV: Female Business Managers) 65

Graph 9) Stage 3: Poisson & Negative Binomial Probabilities (DV: Asset Ownership) 66

List of Tables

In-text

| | |
|--|----|
| <u>Table 1)</u> Country Comparison | 23 |
| <u>Table 2)</u> OLS Regression for Stage 1 | 33 |
| <u>Table 3)</u> OLS Regression for Stage 2 | 35 |
| <u>Table 4)</u> Negative Binomial, Poisson and Logistic Regression for Stage 3 | 37 |

Appendix A

| | |
|---|----|
| <u>Table I)</u> Descriptive Statistics Stage 1 | 56 |
| <u>Table II)</u> Descriptive Statistics Stage 2 | 56 |
| <u>Table III)</u> Cross-Country Summary Stage 1 & 2 | 57 |
| <u>Table IV)</u> Descriptive Statistics Stage 3 | 58 |
| <u>Table V)</u> Variable Construction Stage 3 | 60 |

Appendix C

| | |
|---|----|
| <u>Table I)</u> OLS Regression | 67 |
| <u>Table II)</u> OLS Regression | 68 |
| <u>Table III)</u> Negative binomial, Poisson and Logistic Regression in Nigeria | 69 |
| <u>Table IV)</u> Negative binomial, Poisson and Logistic Regression in Cameroon | 70 |
| <u>Table V)</u> Negative binomial, Poisson and Logistic Regression in Benin | 71 |
| <u>Table VI)</u> Negative binomial, Poisson and Logistic Regression in Guinea | 72 |

List of Abbreviations

| | |
|--------|--|
| WEE | Women's Economic Empowerment |
| SSA | Sub-Saharan Africa |
| OECD | Organisation for Economic Co-operation and Development |
| SIGI | Social Institution and Gender Index |
| OLS | Ordinary Least Squares |
| UN | United Nation |
| UNDP | United Nation Development Program |
| DHS | Demographic Health Survey |
| GDP | Gross Domestic Product |
| ILO | International Labour Organisation |
| FINDEX | Financial Inclusion Index |
| VIF | Variance Inflation Factor |
| WBL | Women, Business and Law |

1. Introduction

Since the adoption of the Millennial Goal in 2000, gender equality has been given increasingly more attention in development strategies around the world, where it was said that:

“Gender inequality holds back the growth of individuals, the development of countries, and the evolution of societies, to the disadvantage of both women and men” (UNPF, 2000, p.1).

Five-teen years later, the 2030 Agenda for Sustainable Development was published and the global commitment to women’s economic empowerment (henceforth WEE) has never been stronger (UN, 2015). WEE is defined as the women’s ability to independently earn and control their income, seize economic opportunities and exercise their agencies, and thereby functions as an integral part of inclusive growth (Kabeer, 2012). Female empowerment should be a core part of economic development plans (Duflo, 2012; Diebolt, Perrin, 2013; Mehra, 1997) and as researcher Almaz Negash (2010) puts it, ignoring it is an “economic disaster”. As this thesis will argue, prioritising female economic empowerment and gender equality is not just necessary in its own right but also provides positive linkages to the “wealth and well-being of nations” (Blumberg, 2005, p.1).

A key aspect to achieve WEE, as this study will suggest, is through the use of financial tools. Financial inclusion is defined as the availability of useful and affordable financial services, for which the access should be universal and equal (World Bank, 2018). The fact that financial inclusion is an integral part of sustainable economic growth and equality is generally accepted (Demirgüç-Kunt, Klapper, & Singer, 2013). Yet, there is still a high gender disparity in the inclusion in the formal financial system in developing countries, especially in sub-Saharan Africa (African Development Bank, 2015). This is particularly problematic given the amount of research focusing on mobile money and financial inclusion, which fails to investigate the gender gap of these financial tools in SSA (Peruta, 2018; Ivatury & Mas, 2008; Hughes & Lonie, 2007). Women still own less, earn less and are often not in control of their decisions and life choices, disabling them to fully participate in the economy (Hendriks, 2019). Therefore, WEE, which is built on the nexus between resources, agency and economic achievement, may be the key to a more inclusive and equal society.

1.1 Research Problem

Conceptualising and quantifying WEE is not novel, however, there has been little consensus, especially in sub-Saharan Africa, on its rightful measurements and influences. Moreover, there is little research, to the best of my knowledge, that specifically looks at the impact of financial services within the framework of WEE. The connection between the concept of WEE and financial inclusion in the context of SSA is therefore unprecedented. WEE is a dynamic, contextual and multidimensional concept, which not only functions on a national, but more importantly on household and individual level. By researching WEE and its relationship to financial inclusion and economic development, one has to be cautious of those measurement levels. This is especially important for policy implications, as interventions on the wrong level can yield counter-productive results. Therefore, the research questions that this thesis will investigate are divided into a macro (Stage 1 & 2) and a micro level (Stage 3), stating as follows:

- Stage (1) Does women's economic empowerment foster economic development in SSA?*
- Stage (2) Does financial inclusion facilitate women's economic empowerment in SSA?*
- Stage (3) Does financial inclusion facilitate women's economic empowerment in Cameroon, Guinea, Benin & Nigeria ?*

1.2 Aim and Scope

By answering these research questions, this thesis sets out to explore, conceptually and empirically, the relationship between financial inclusion, economic development and the *process* and *outcome* of WEE. Following a top-down approach, the analysis is divided into three stages. On an aggregated level, an OLS regression will estimate the said relationship in 30 sub-Saharan Africa countries for the year 2017, whilst answering the first two research questions in Stage 1 and 2, respectively. On an individual level, the relationship between WEE and financial inclusion will be analysed in Stage 3. The focus lies on western Africa, specifically Benin, Cameroon, Nigeria and Guinea, where I will be using the Demographic Health Survey for the year 2018. Thereby, this thesis aims to quantitatively investigate the mechanism behind WEE, the nexus between resources, agency and achievement as well as their patterns within different measurement levels.

1.3 Outline

Within the Literature Review in Section 2, I first introduce and discuss the general concept of female empowerment and its effects on economic development. After having established the relationship between these variables, I specify my research scope to the sub-Saharan African context and discuss the role of women in the given environment. Then, I further narrow down my research topic and focus specifically on female economic empowerment by proposing a conceptual framework for further analysis. Here, I introduce the three building blocks of WEE, which are resources, agency and achievement and explain their interconnectivity. Lastly, I discuss the importance of financial inclusion as a tool for WEE within the Sub-Saharan context. Before introducing the Data chapter in Section 4, where the key data sources are presented and the variables are constructed, I propose the analytical concept in Section 3. In the methodology and empirical strategy chapter (Section 5), the regression equations are presented and explained. There, I first test for a relationship between WEE and economic development (Stage 1), then the associations between financial inclusion and WEE are analysed (Stage 2 for the macro level and Stage 3 for the micro-level). The results of my empirical analysis and its discussion are presented in Section 6. After the thesis concludes in Section 7, the Bibliography and Appendix are referenced in Section 8 and Section 9, respectively.

2. Literature Review

In this thesis, I follow a top-down approach, which enables me to explore and analyse female empowerment in different settings. First, the overall relationship between female economic empowerment and economic development is reviewed. After establishing why empowerment matters for development, I examine the mechanism behind female economic empowerment whilst assessing the role of financial inclusion as a facilitator for said empowerment. By doing so, I create three different levels of analysis, which incorporate a macro and micro level.

2.1 Female Empowerment for Development: Why does it matter?

Empowerment is defined as the “process by which those who have been denied the ability to make strategic life choices acquire such an ability” (Kabeer, 1999). The research on empowerment initially began with the work of Amartya Sen, who developed the Capability Approach for development (Sen, 1985). In his view, capabilities and agency foster empowerment as they are essential in creating and having the freedom to choose “what a person can do or can be” (Sen, 1999). This particular research on gender inequality was primed, among others, by the discovery that females have significant survival disadvantages, a phenomenon known as “missing women”, within developing countries (Sen, 2003; Klasen, 1994). Since then the conceptual framework of empowerment and female empowerment specifically has been extended. Empowerment embodies a process of change that transcends to the political, economic and social spheres (Kabeer, 1999). Moreover, the operation of power, which enables a person to make choices, engages diverse levels of interaction, such as individual, household or communal. Therefore, the concept of empowerment is one of the multiple dimensions engaging in a variety of levels and spheres.

As women are systematically (and globally) disadvantaged, female empowerment focuses on the multidimensional inclusion of women and the gender-sensitive analysis and implementation of policies (Malhotra, Schuler & Boender, 2002). With over half of the world being female, a gendered perspective on empowerment and its effect on development is necessary. Whilst acknowledging the intersectionality of gender inequality with race, sexuality, class, ethnicity, religion and disabilities, the focus of this thesis remains on the standalone gender aspect (UN Women, 2021).

The academic literature on the relationship between female empowerment and development has been an extensively researched topic within economics and development studies (see, for example, Duflou, 2012, Seguino 2010, Hendriks 2019; Blumberg, 2005, and Kabeer, 2012). These sources suggest a strong relationship between female empowerment and economic growth. However, as a country develops, a woman's political and economic rights automatically increase (Duflo, 2012), implying there is a mutually reinforcing dynamic between development and empowerment. So the question remains: "Is growth enough for female empowerment, or is there a need for more?". Esther Duflo (2012) argues that economic development in itself is not sufficient for gender equality, emphasising the importance of policy-making and gender-specific interventions.

Empowering women and girls can yield multiple direct and indirect effects on the development of a country. Female health, education and decision-making abilities can directly or indirectly facilitate increases in employment and children's human capital accumulation, which improves a country's income.

Early development policies focused intensively on the investment in reproductive rather than productive aspects of the female lifecycle (Doepke & Tertilt, 2018), which made sense given that female health, empowerment and economic development are connected. A comprehensive empirical analysis and discussion on the subject were presented by Bloom, Kuhn and Prettnner (2020), who showed how improvements in female health reduce fertility, enabling an economy to accelerate its demographic transition and thereby move towards sustainable growth. Bloom, Kuhn and Prettnner (2020) argue that without improvement in female health, a poor country will be stuck in a slow-growth model which is defined in terms of high fertility and low educational attainment. Moreover, healthy women are generally more empowered which generates co-benefits such as lowering youth dependency, increase in reproductive decision-making and a rising focus on schooling which decreases the average fertility rate (Bloom et al., 2020). Therefore, investment in women's health will have positive direct effects on economic growth and development through increased labour market participation and additional investments in education. Furthermore, female health also indirectly impacts development through the improving health of their children and the significant decrease in child labour (Mendolia, Nguyen & Yerokhin, 2019).

To further determine the effects of female empowerment on economic development, Klasen (2002) concludes that economic growth is directly impacted by gender inequality in education, as it

decreases the overall level of human capital. High levels of empowerment and education reinforce each other. Educating women increases the lifespan of children, reducing maternal mortality and has been shown to positively affect the educational attainment of both girls and boys (Duflo, 2012), thereby lowering the culturally enforced preference for boys (also referred to as son bias). Furthermore, empowerment through education fosters female's labour force participation, which directly adds to economic growth (Glewwe, Maïga & Zheng, 2014). This is particularly important given the fact that women are disproportionately affected by poverty, which has been termed the feminisation of poverty (Peterson, 1987). Estimations by Mundial (2012) show that about 30% of the reduction in poverty and income inequality from 2000 to 2010 was due to the increasing labour force participation of women in Latin America and the Caribbean.

Lastly, empowered women impact the economic development of a nation through increased bargaining power and more altruistic decision-making abilities. For example, studies by Duflo and Udry (2004), and Benhassine et al. (2011) have found that there is a distinct difference between how men and women use extra (financial) resources they have been given. Additional money earned or given to women will increase spending on the household's overall food consumption and children's education for both girls and boys, which reduces the overall son bias. This was not observed when male participants were given the extra income, which was spent on private goods as well as alcohol and tobacco (Duflo and Dry, 2004). Of course, women being benevolent household members is not always the case, sometimes the exact opposite occurs (Edmonds, 2006). Moreover, intrahousehold dynamics depend on a person's bargaining power, which mostly is higher for men, meaning that interventions on the individual level can be neutralised by household power struggles (Laszlo, Grantham, Oskay & Zhang, 2020).

Collectively, the studies presented above outline a critical role for empowerment as a mechanism facilitating development. Introducing measures to promote gender equality in health, education and employment will create a "win-win" scenario for broad societal development. However, female empowerment cannot be investigated in a vacuum. Interventions on the household level do not have the same impact as on the individual level, as male-headed and female-headed households have different spending priorities (Perez, 2019, pp.257-258). Therefore, it is essential to acknowledge the measurement level. The following section specifies the scope of this thesis to the background and setting of female empowerment in sub-Saharan Africa.

2.1.1 Female Empowerment in Sub-Saharan Africa

Africa has been experiencing GDP growth rates with an average of 5% in the last ten years, positioning the continent in second place, behind Asia, for the global race for economic growth (Mohammed, Mensah, Lord & Gyeke-Dako, 2017). However, SSA still hosts some of the poorest countries of the world, which all face unique challenges including a growing, yet young population entering the labour market (Bandiera, Buehren, Burgess, Goldstein, Gulesci, Rasul & Sulaiman, 2020).

Women's empowerment is a contextual concept that varies between regional and national boundaries. Within SSA, the role of women and girls takes on different priorities than, for example, in South Asia. Africa, as a continent and specifically its West coast, has been severely affected by slavery with its impact still felt today (Nunn, 2008). Demographic shifts caused by the Trans-Atlantic trade in predominantly male slaves created a high female-to-male ratio in western SSA, which influenced family and household structures (Dalton & Leung, 2014). One of those structural changes is the increase in polygamous relationships, which occurs when a man has multiple wives (Dalton & Leung, 2014). This is particularly common in Western African countries such as Guinea and Benin, where 44% and 25% of their women are in a polygamous relationship, respectively (Dalton & Leung, 2014). Some cross-sectional studies have conclusively shown that there is an association between polygyny and increased fertility, lower savings, higher illiteracy in women and a decrease in power (Schoellman and Tertilt, 2006; and Tertilt, 2005 in Dalton & Leung, 2014).

Even though the demographic gender balance has been regained, given the average of roughly 49.5% of females in Western SSA and 50.1 % of female in overall SSA (World Bank, 2021), social changes, such as polygyny remain. Furthermore, SSA is known for its young population, with countries like Guinea and Nigeria having an age dependency ratio above 80%, indicating high proportions of children in the population in comparison to the elderly and working-age people (World Bank, 2021). Coupled with high unemployment rates such as Nigeria with 9% and Gabon with more than 20%, many people tend to become entrepreneurs out of necessity (World Bank, 2021). Therefore policymakers increasingly emphasised the importance of gender-balanced employment and equal access to entrepreneurship (Bandiera et al., 2020). Female empowerment, specifically female economic empowerment (which will be discussed in the following section), focuses on these aspects, thereby enabling equal labour market opportunities between genders.

2.2 Women's Economic Empowerment

It is argued that the empowerment of women is important for the welfare of a country, playing a role in multiple spheres, such as legal, political, economic and social (Ibrahim and Alkire, 2007). Given the scope of this study, I limit my attention to the economic sphere of women's empowerment. Women/Female Economic Empowerment (WEE) is centred around the equality of genders in the economic market, which includes access to work, equal pay and a balanced workload (Buvinic, O'Donnell, Knowles & Bourgault, 2020). The goal of WEE is to enable women to benefit from and contribute to the economic growth of their country equally as men do (Buvinic & Furst-Nichols, 2016).

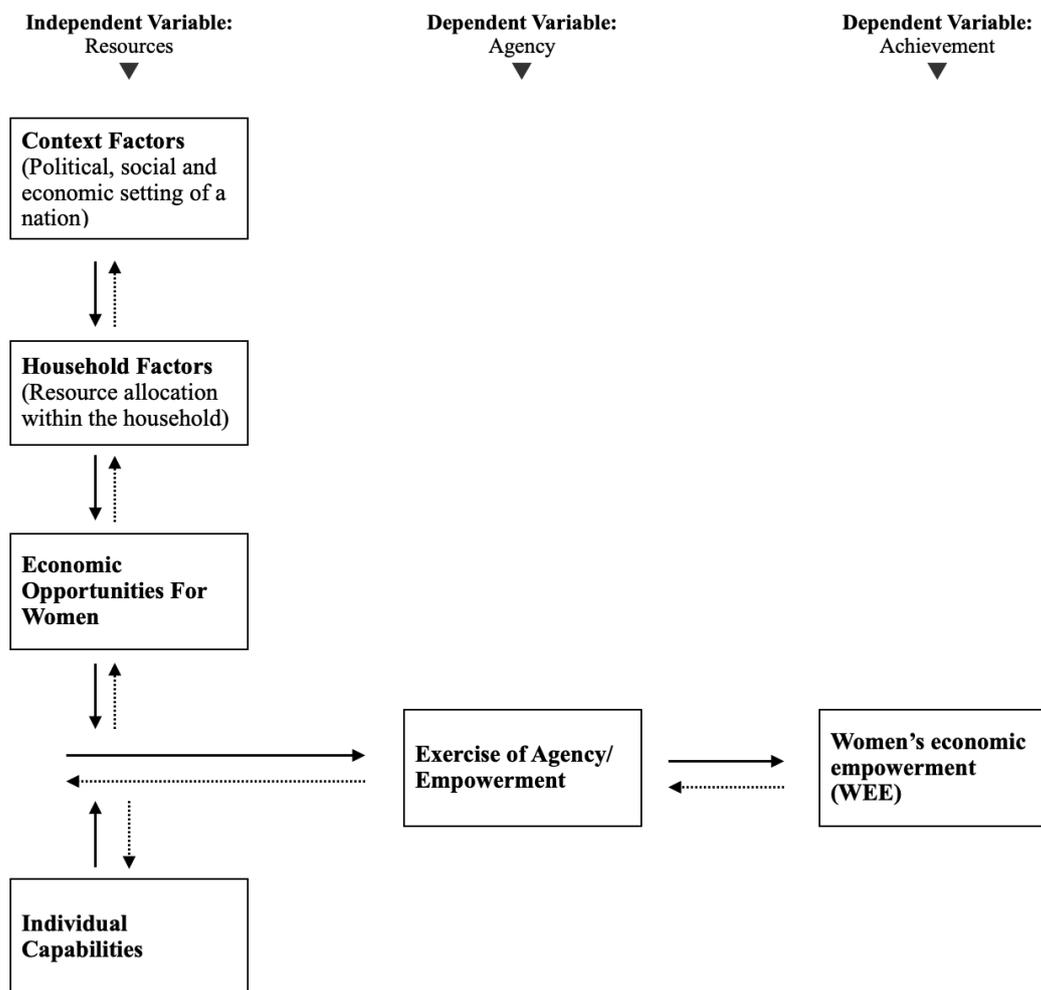
With the internationally recognised urgency of the 2030 Sustainable Development Goals, female economic empowerment has been placed at the top of the agenda (UN, 2021). The focus lies on increasing women's labour force participation and economic opportunities whilst decreasing the gender wage gap (Ferrant & Thim, 2019). Women's labour force participation rate is at approximately 54% globally, whilst the male rate is at 81% (World Bank, 2017). This, however, does not indicate the amount of labour provided. Globally, women spend 1.13 more time on both paid and unpaid work than men, given that an average woman works 425 minutes per day (with 276 minutes for unpaid and 152 minutes for paid work) whilst a man works a total of 375 minutes (with 110 minutes for unpaid and 266 minutes for paid work) per day (Charmes, 2019). Acknowledging the fact that globally, women contribute more of their time to work and specifically unpaid care work and household chores than men do, the challenge is to empower women both in the public and in the private (household) level. WEE aims to provide equal pay, work hours (for both paid and unpaid work), work satisfaction and self-esteem (Buvinic et al. 2020).

2.2.1 A WEE Framework: Processes & Outcomes

Kabeer (1999) provides one of the first frameworks for female empowerment, which is centred around three main factors, namely resources, agency and achievement. Her work is further extended by Buvinic et al. (2020), who define WEE as a multi-dimensional concept encompassing national, communal, household and individual levels in which women act. Buvinic et al.'s framework, which my analysis is built on, has three main levels for which WEE is defined, where economic

empowerment is both a process as well as an outcome, which depend on the resources provided (Figure 1).

Figure 1) Adoption of the Women’s Economic Empowerment Framework by Buvinic et al. (2020)



WEE, similarly with the overall empowerment spheres, is contextual and can manifest itself in different ways given the cultural environment and societal structures (Buvinic et al., 2020). Even though these contexts have been thoroughly studied, there is no precise consensus on the definition and application of female economic empowerment (Blumberg, 2005; Chew, Ilavarasan & Levy, 2015; Ferrant & Thim, 2019; Hendriks, 2019; Kabeer, 2011, Kabeer, 2012; Kidder, Bright, & Green, 2014; Laszlo et al., 2020). As Naila Kabeer states “For many feminists, the value of the concept lies precisely in its ‘fuzziness’ ” (Kabeer, 1999, p.436). Nonetheless, Buvinic et al. (2020) have created a compendium summarising and synthesising the most up-to-date academic literature on WEE. In accordance with Kabeer’s work (1999), Buvinic et al.’s (2020) framework enables empowerment to be represented in a dynamic setting. As seen in Figure 1, economic empowerment

is a *process* in which a woman exercises her agency which ultimately leads to the final WEE *outcome* “economic achievement”. Both the *outcome* and the *process* of WEE as well as the overall *resources* are in a mutually reinforcing relationship to each other.

The preconditions for exercising one’s agency are embodied by contextual and household factors, which shape the economic opportunities for women as well as individual capabilities. Contextual factors include the political, social and economic settings of a nation. Furthermore, they describe the economic features of a country, which also includes its financial inclusiveness. The impact of financial technologies, which are thoroughly discussed in section 2.3, are therefore considered resources. Tools such as mobile money, internet banking and mobile phone adoption are contextual factors influencing a woman’s agency to act and effect change in their individual lives but also their households, communities and nations (Bhatia & Singh, 2019). Therefore, these contextual resources greatly influence the dependent variables agency and economic achievement. Household factors are influenced by the power dynamics within the household, which can depend on, for example, whether the husband has multiple wives. A household is a unit of people in cohabitation, where their relationships and dynamics are complex and vary for each context. Even though it would be in the household’s best interest to be cooperative, often they are not. As touched upon in section 2.1 and according to the uncooperative household model, the spouses have different preferences when it comes to household spending and consumption (Doepke & Tertilt, 2014). Similarly to what Duflo and Dry (2004) have proved, Doepke and Tertilt (2014) provide evidence that when women receive more resources, their spending on children increases significantly, highlighting the different spending priorities. This example shows how essential the different levels of WEE measurement are since there is a distinct difference between intervening on the individual and the household level.

Moving on to the intermediary variable of [Figure 1](#), the exercise of agency fosters a women's economic empowerment, and can therefore be considered as the *process* leading to it. It is crucial to understand the different measurement dimensions between WEE and agency, as one influences the other ([see Figure 1](#)). On the one hand, the *process* of WEE enables women to exercise their agency, which includes control over profits, decision-making capabilities and the ability to acquire necessary resources and skills to compete in the market (Buvinic et al., 2020). Agency has previously been proxied by education and employment, which fails to differentiate between pre-conditional resources and the exercise of agency (Malhotra & Mather, 1997). By definition, the exercise of agency implies the ability to make choices and decisions, to have control and to act

autonomously (Samman & Santos, 2009). Ibrahim & Alkire (2007) and Hanmer & Klugman (2016) have attempted to categorise agency into different domains, enabling quantification. Even though there is no clear-cut indicator, most of academia agrees that agency is a complex, dynamic and contextual concept that can be best indicated by the decision-making ability within the household and individual level including reproductive choices, freedom of movement, attitude towards gender-based violence and social norms such as son biases (see for example Hanmer & Klugman, 2016; Ibrahim & Alkire, 2007; and Samman & Santos, 2009).

On the other hand, economic empowerment and economic achievement are also the *outcomes* of Buvinic et al. 's WEE framework ([Figure 1](#)). Economic achievement indicates improvements in income, self-esteem, employment opportunities and business profitability, which is WEE's overall goal. This translates into increased employment, business ownership beyond subsistence, managerial roles and equality of wages. Moreover, in the sub-Saharan context, economic achievement, on the individual level, also implies an increase in female land and house ownership and their type of earnings. Women in sub-Saharan Africa own roughly 15% of agricultural land, which "significantly obstruct access to financial assets" (Doss, Kovarik, Peterman, Quisumbing, & Van den Bold, 2015).

In view of all that has been mentioned so far and as shown in [Figure 1](#), the framework does not provide a one-way relationship. Women's Economic Empowerment is dynamic, where resources, agency and achievement are in constant exchange with each other. An empowered woman will increase the exercise of her agency, which, in the long run, will improve her individual capabilities as well as her economic opportunities. These feedback loops are "both virtuous and vicious cycles", which can equally foster progress or "reinforce gender inequality traps" (Buvinic et al., 2020, p.14).

2.3 Gendered Financial Inclusion in Sub-Saharan Africa

Financial inclusion is defined as equal and cheap access to an account at formal financial institutions such as a bank or at a mobile money provider (Zins & Weill, 2016). Having an account allows for the possibility of saving, smaller transaction costs and payment services. Moreover, the development of a country's financial system can help drive economic growth (Duncombe, 2012). The process of such development is commonly measured in the percentage of formal account

ownership, formal savings and formal credit access (World Bank, 2018). However, these measures are not universal. In SSA, formal financial institutions like banks are not always the best option. As depicted in [Figure 2](#), SSA is the leader in mobile money account adaptability (Demirgüç-Kunt & Singer, 2013). In contrast to account ownership at formal financial institutions ([Figure 3](#)), sub-Saharan economies have a clear preference (whether intended to or not) to mobile money. Therefore, when looking at financial inclusion in SSA, one has to widen the definitive scope of what being included means, which in the case of SSA centres around formal account ownership, formal savings and formal credit access as well as mobile money usage.

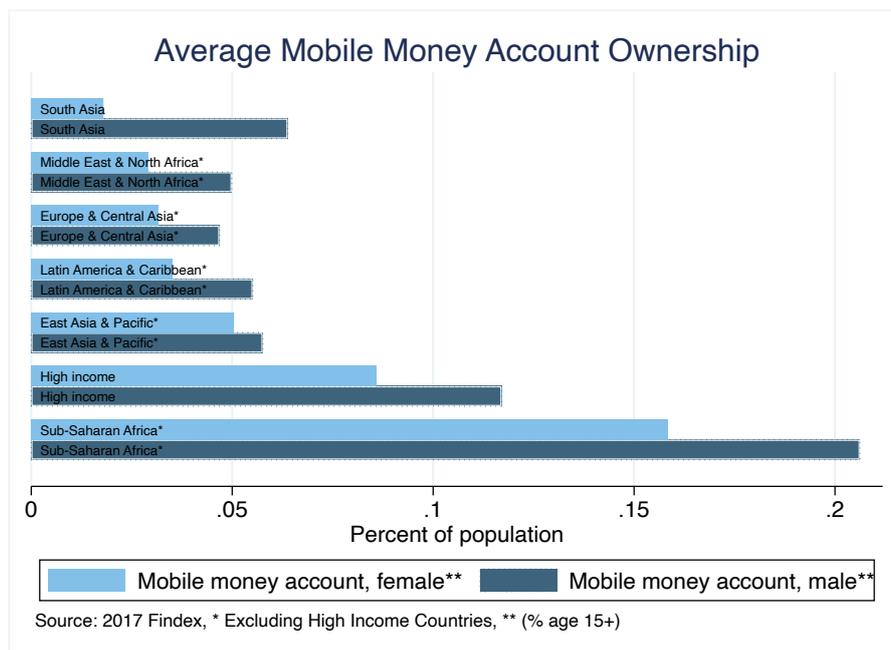


Figure 2) Average Mobile Money Account Ownership Average Account Ownership (Source: World Bank, 2018)

Financial exclusion is a problem because savings and investments are less stable, expensive and tardy (Siddik, 2017). Mobile money, for example, allows its user to send and receive money using their mobiles phones and thereby enables unbanked people to gain easy access to cash and capital without the need for a traditional bank account (Duncombe, 2012). Moreover, financial inclusion programs have only recently begun to specifically target women as the ones being excluded. Despite the clear benefits, there are roughly 1.3 billion women excluded from the financial system globally (Demirgüç-Kunt & Singer, 2013). Previous research findings have found a significant association between financial inclusion and female empowerment. For example, Buvinić, and Furst-Nichols (2016) show, mobile money has a positive impact on WEE, given its advantages of privacy and autonomy, which is essential for women and female entrepreneurs. The cheapness of transaction and the minimal onboarding costs are more favourable than the more expensive

traditional bank account. Furthermore, Siddik (2017) demonstrated that promoting female financial inclusion in Bangladesh decreased a woman’s dependency on local money lenders and enabled them to save capital as well as invest in education and health. Moreover, female financial inclusion can increase her bargaining power within the household, control her assets and decrease vulnerability by diversifying financial risks (Siddik, 2017).

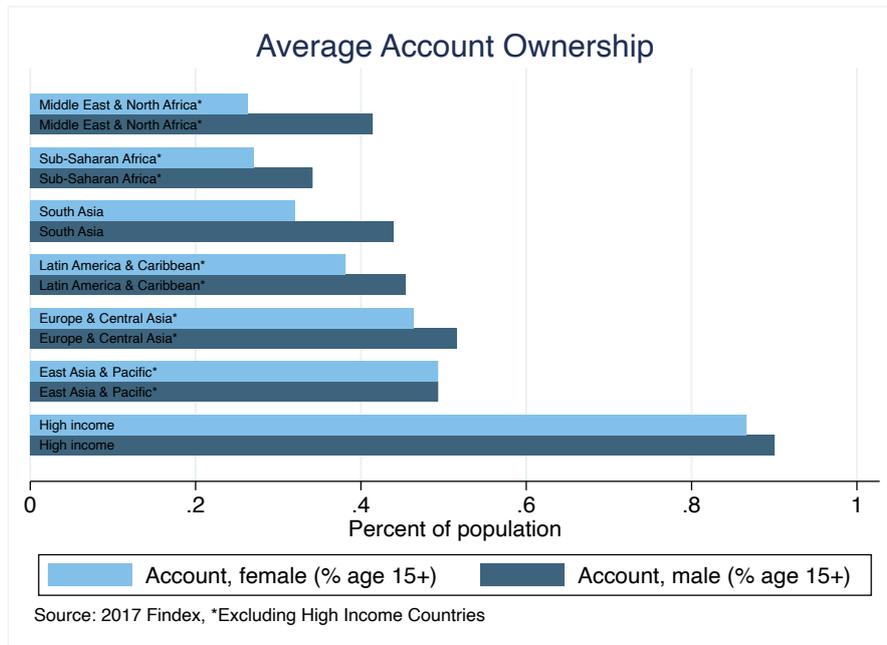


Figure 3) Average Account Ownership (Source: World Bank, 2018)

Research has shown that financial inclusion in SSA has a positive impact on income, but mostly for rich, educated and older men (Zins & Weill, 2016). Demirgüç-Kunt et al. (2013b) record findings using the 2012 Findex, showing that there is a significant gender gap in formal savings, account ownership and formal credit in a sample of 98 developing countries. This significant gender gap can still be seen in [Figure 2](#) and [Figure 3](#), depicting data from the Findex from 2017. Nonetheless, women in SSA “are more mobile, conspicuous in the public domain, and free to maintain separate finances” (Sudarkasa 1986; Perry 2005; Agarwala and Lynch 2006; Schatz and Williams 2012) than women in South Asia. Therefore, it is surprising that there are still such gender differences in adoption in SSA ([Figure 2](#)) and provides grounds for further analysis.

2.3.1 Financial Inclusion and WEE

The unambiguous relationship between poverty and female empowerment, where women are disproportionately affected by poverty, has led to a frequent adoption of targeted cash-transfer

schemes (Kabeer, 2005; Doepke and Tertilt, 2014; Kinyondo & Magashi, 2019). Targeted transfers aim to enhance children's well-being by transferring money to poor mothers but mostly ignore the need for female empowerment in itself (Molyneux & Thomson, 2011). Cash-transfers are seen as a useful tool for empowerment, however, Molyneux & Thomson (2011, p.209) argue that even though these poverty programs help children, they have the “adverse consequences of reinforcing women's caring role at the expense of developing their capacity and resilience to survive poverty”. These studies on poverty-reducing policies exemplify some unintended consequences which have two main implications. First, empowerment goes beyond the enhanced caregiver role of women; and second, women need tools that increase economic opportunities through accessing the means for self-support. Financial inclusion tools have the potential to directly influence female economic empowerment beyond the caregiver role, as they could be used as means for self-support.

Some studies have postulated a negative relationship between financial inclusions and female (economic) empowerment (see for example Annan, 2019), yet most have found positive associations (Bhatia & Singh, 2019; Buku & Meredith, 2012; Chew, Ilavarasan & Levy, 2015). Financial tools can have a positive impact in fostering female economic empowerment and equality (Hendriks, 2019). Following the WEE framework from Buvinic et al. (2020), financial tools can be categorised as contextual resources, acting as pre-conditions for agency and economic achievement. Financial inclusion has the potential to integrate women into the economy, increase incomes, decrease poverty and enable women to exercise their agency (Hendriks, 2019). However, the limitation to exercising one's agency is also limiting the access to said financial services, as women who are restricted to work, who were married at a young age or have experienced (sexual) violence are less likely to own financial accounts (Demirgüç-Kunt, Klapper & Singer, 2013). This indicates a vicious cycle in which financial inclusion improves agency but agency is required to become financially included. Research shows that when women get access to financial services and tools “they are better able to manage risk, start or invest in a business, and fund large expenditures like education or a home improvement” (Holloway, Niazi, and Rouse, 2017, p. 3). This is particularly important given the fact that women are disproportionately affected by poverty, which results from unequal access to labour and market opportunities. Within a household, the husband is often the one who possesses an account at a financial institution or mobile money provider. However, this is not a phenomenon purely applicable to SSA. As [Figure 2](#) and [Figure 3](#) show, the gender gap of financial inclusion occurs on a global scale. Sources within the Asian context summarised by Hendriks (2019) claim that gender-sensitive financial inclusion, unlike cash transfers, can shift the power

balance within the household, increasing a woman's control and decision-making abilities. If these power imbalances can be changed similarly in the context of SSA is unclear, which provides further grounds for this thesis.

3. Analytical Concept

Facilitating the top-down approach that also structured the Literature Review, I explore the relationship between financial inclusion, development and female economic empowerment on multiple measurement levels, whilst also attempting to examine the mechanism between agency achievement. As highlighted previously, similar interventions on different measurement levels, such as communal, household or individual, yield different results. Therefore, the following quantitative analysis is performed in three analytical stages, for which each stage refers to their corresponding hypothesis stated below. During the first stage, the relationship between women's empowerment and development is analysed on a cross-country level within SSA in 2017. For the second stage and third stage, I investigate the specific mechanisms of WEE by testing for a relationship between financial inclusion and empowerment. These two levels allow for a cross-country (Stage 2) as well as an individual analysis (Stage 3), which is crucial for the understanding of the relationship between financial inclusion and WEE. The third stage, given its micro-level analysis, takes a closer look at Cameroon, Benin, Guinea and Nigeria in 2018.

Following the framework by Buvinic et al. (2020), which was introduced in section 2.2.1, I investigate the dynamics between resources, agency and empowerment. The interconnectivity between the three WEE dimensions ([Figure 1](#)), makes female economic empowerment a challenging process to measure. Nonetheless, multiple indicators have been suggested for international and national settings (see Hanmer & Klugman, 2016; Malhotra et al., 2002, Ibrahim and Alkire, 2007; Kabeer, 1999; Buvinic et al., 2020). Buvinic et al. (2020) provide a theoretical guide on the various measurement levels and available datasets, which is utilised in my methodology. I focus on female economic achievement because the *outcome* of WEE is less dynamic than the *process* of WEE and hence easier to measure.

The first and second stage provides a general estimation of the relationships between female economic empowerment, financial inclusion and development on an aggregated country level using household data. The third stage, given its focus on individual-level measurement, is not only the most important analytical juncture but is also expected to have the most convincing results. Even though the focus of the following analysis will be on economic achievement, instead of the exercise of agency, agency is included and controlled for in all steps of my analysis. Separating

the *process* and *outcome* of WEE would create incomplete measurements yielding meaningless results (Hanmer & Klugman, 2016; Charmes & Wieringa, 2003). In the context of SSA between 2017 and 2018, I am trying to explore the impact of the synthesis between agency and achievement on the one hand, and their relationship with economic development and financial inclusion on the other. Thereby, I am hoping to get a clearer picture of the relationship between resources, agency and economic achievement and test for the following hypothesis:

Hypothesis (1) The process and outcome of Female Economic Empowerment increase national income.

Hypothesis (2) On a macro-level, Financial Inclusion increases Female Economic Empowerment measured using three indicators:

- (a) the percentage of firms with female participation in ownership.
- (b) the proportion of permanent full-time workers that are female.
- (c) the percentage of firms with a female top manager.

Hypothesis (3) On a micro-level, Financial Inclusion increase Female Economic Empowerment measured using three indicators:

- (a) female employment.
- (b) female earnings paid in cash payments.
- (c) female asset ownership.
- (d) household wealth.

The following section introduces the datasets for each of the three stages and explains how the different variables are constructed. Issues and limitations of each stage are discussed as well.

4. Data: Quantifying WEE

The datasets are assembled from secondary sources published by renowned international institutions that are common within the field of development economics including the World Bank, the OECD, UNDP and USAID. Given the top-down structure introduced before, the data chapter is divided into three sections, one for each analytical stage. An overview of the 30 SSA countries studied in Stage 1 and 2 are shown in [Appendix A, Table III](#).

4.1 Stage One: WEE and Economic Development

Within the first stage, I measure the impact of WEE on a country's economic development in 30 SSA countries. The GDP of a country embodies a country's income and the size of an economy. Therefore, GDP per capita is used as a proxy for economic development. Facilitating data gathered by the World Bank Group provide good estimates for economic development. [Table I](#) in Appendix A presents the descriptive statistics for this stage of analysis.

To measure the *outcome* of WEE, economic achievement, on a cross-country basis within SSA, I use the World Bank's Enterprise Survey. The gender dimension of the survey supplies six indicators about female entrepreneurship and economic participation in the labour force. Economic achievement, by definition, indicates improvements in income, self-esteem and business profitability. However, measurements for self-esteem in developing countries are scarcely measured, if at all. Therefore, quantifying female employment, business leadership and ownership created a reliable and valid proxy for economic achievement given the WEE framework (Buvinic et al., 2020). The Enterprise Survey (World Bank Group, 2021a) is grounded in survey responses of more than 161,000 private sector, non-agricultural companies in 144 countries, which are globally comparable across nations. The surveys were administered by the Enterprise Analysis Unit, which outsources the data collection. The data is not consistent over time, meaning individual country data is derived from any year between 2009 to 2021. Furthermore, the survey uses a stratified random sampling methodology (World Bank Group, 2021b). A core limitation of using the Enterprise Survey is the fact that they do not survey micro-businesses. The surveys, therefore, oversample large firms, which have above a hundred employees with the smallest firm size included 5-19 employees. This is problematic because most women in SSA work at or own micro-businesses (Kitindi, 2006). Despite that, the survey allows me to measure women participation in ownership,

leadership and employment in bigger companies, which provides me with a stronger measurement of economic achievement.

There has been little consensus on how to measure agency on an aggregated level (Laszlo et al., 2020). I previously established that the process of WEE enables women to exercise their agency, control their profits as well as increase their decision-making capabilities, which are all to be measured on an individual level. The Demographic Health Survey (DHS) is one of the few primary data sources that facilitates precise measurement and differentiation between empowerment and agency and would have been the preferred dataset used in this initial analysis (Laszlo et al., 2020). Even though the DHS, which will be used on a micro-level, can be aggregated to national levels, the observations lacked consistency over time and across observations. Therefore, I proxy agency and also, to some extent, resources using the Social Institution and Gender Index (SIGI) from the Organisation for Economic Co-operation and Development (OECD). The index provides 27 variables for four dimensions measuring discrimination in the family, restricted physical integrity, restricted access to productive and financial resources and restricted civil liberties. These agency indicators are consistent with key definitions of Buvinic et al.'s framework and with micro-level research conducted by Ibrahim and Alkire (2007) and Hanmer and Klugman (2016). Therefore, it can be assumed that the SIGI is able to reliably measure the process of women's economic empowerment in terms of agency and equal access to resources, which taken together with the World Bank's Enterprise Survey provides holistic measurements of WEE (Buvinic et al., 2020).

4.1.1 Variable Construction & Measurements

Dependent Variable

Economic development is commonly computed by gross domestic product (GDP) estimates, as seen in gender-sensitive works done by Bloom et al. (2020) and Zhang, Zhang and Li (1999). Therefore, I utilise the logarithm of GDP per capita as the proxy for economic development. The variable is defined as the logarithm of the gross domestic product divided by the midyear population in 2017 measured in current U.S. dollars (World Bank, 2021). Table III in Appendix A shows the GDP per capita data for all 30 countries studied. In the sample, Malawi has the smallest GDP per capita at 356 USD and Botswana has the highest given 7,893 USD per capita.

Independent Variables

Economic achievement, as defined by the increase in income, self-esteem and business practices (Buvinic et al., 2020) and can be measured through the World Bank's Enterprise survey. Ideally, I would also like to include variables measuring the gender wage gap and thereby accounting for income differences, however, due to a lack of data, there are only 10 SSA country observations available from the ILO database (ILOSTAT, 2021), making a cross-country analysis impossible. Nonetheless, the World Bank's Enterprise Survey data provide an adequate substitute. The items used are "Percent of firms with female participation in ownership", "Proportion of permanent full-time workers that are female (%)" and "Percent of firms with a female top manager" making it possible to measure female entrepreneurship and economic empowerment on an aggregated level ([Table I, Appendix A](#)).

Agency is best represented by the Social Institution and Gender Index (SIGI), which ranges from 0 to 100 percent, with a country scoring 0 being gender-equal, therefore higher values indicate higher inequality. The SIGI is based on the data from the OECD's Gender, Institutions and Development Database (OECD, 2019) in 2017. The index consists of four sub-indexes, which are all included separately ([Table I, Appendix A](#)). The discrimination in the family dimension accounts for laws on child marriage, laws on household responsibilities, equality of legal rights to inheritance of assets and laws on divorce. The sub-index representing a female's restricted physical integrity is compromised of the attitudes towards domestic violence, the existence of laws that prohibit violence against women and attitudes towards female genital mutilation as well as the sex ratio of children accounting for missing women. A woman's restricted access to productive and financial resources is measured by whether a country has equal legal rights and secure access to land, non-land assets and financial services as well as equality of workplace rights. Furthermore, the SIGI includes a sub-index for a woman's restricted civil liberties which reflects the equality of citizenship rights, freedom of movement, political voice and access to justice. Lastly, an additional measurement for son biases is included, accounting for a household's preference for sons and its resulting unequal investment in resources, care and nurture between daughters and sons (SIGI, 2021).

Control Variables

Controlling for polygamy, I add an aggregated DHS indicator for the percentage of women that are currently married or in union with men who have two or more wives (DHS Program, 2021). I also

account for the female-to-male ratio of a country's labour force participation and the rural population as a percentage of the total population. The rural population was derived from the World Bank database, which estimates are based on the United Nations Population Division's World Urbanisation Prospects: 2018 Revision (World Bank, 2021). The female labour force participation estimates are taken from the International Labour Organisation (ILOSTAT, 2021). Furthermore, the ILO model estimate of the employment to population ratio for women aged 15-24 are added to control for any side effects of empowerment. Lastly, I introduce a variable measuring female life expectancy at birth in years from 2017, which is used as a proxy for female health (World Bank, 2021).

4.1.2 Limitations and Issues

The dataset was constructed from the most reliable and trustworthy secondary data sources to the best of my knowledge. Notwithstanding, three main challenges remain. First, the WEE framework, where resources, agency and economic achievement are in a dynamic, reinforcing relationship, is highly contextual and can change meaning in different settings. Therefore, the methodologies used to define and measure agency, resources and economic achievement are the weakest on an aggregated level. Nonetheless, looking into the regional differences in SSA decreases the variances considerably, but global indexes such as the SIGI still have to be treated with caution. Second, as indicated in the Literature Review, measurement levels matter. Exercising agency on an individual, household or communal level results in different outcomes, which Stage 1 does not account for. Therefore, looking at the relationship between economic empowerment and development within the SSA is only the starting point of this analysis. The mechanisms behind WEE are still left unexplored, which supplies incentives for the second and third stage. Third and last, the sample size is small. Out of the 54 sub-Saharan countries, only 30 were included. Regardless of the results, further data collection is required and necessary.

4.2 Stage Two: WEE and Financial Inclusion on a Macro Level

In the second stage, using aggregated country-level data, I investigate the relationship between financial inclusion, agency and empowerment in 30 sub-Saharan countries. Combining three datasets on economic empowerment and entrepreneurship, financial inclusion and agency provide a basis for this sub-Saharan comparison. In order to provide a coherent framework across my models,

I use similar data sources for WEE as the first stage analysis. The same country sample from Stage 1 is included, however, in Stage 2, Botswana replaces the Central African Republic due to missing data ([Table V, Appendix A](#)). The descriptive statistics for this stage is referenced in [Table II](#) ([Appendix A](#)).

The Financial Inclusion Index (henceforth Findex) created by the International Monetary Fund (World Bank, 2018) provides one of the most comprehensive gender-sensitive datasets in SSA, allowing me to investigate 41 out of the 46 sub-Saharan economies (World Bank, 2018; UNDP, 2021). The Findex is the most used database when looking for data points about global usage of financial technology and gendered inclusion (Zins & Weill, 2016). The population sample includes over 140 countries and surveys more than 150,000 adults. Each country averaged survey responses of about 1000 civilian participants each (van Oudheusden, Klapper, Demirguc-Kunt & Singer, 2015). The surveys are collected face-to-face by Gallup, Inc. using over 140 languages and are supposed to represent national coverage of persons aged 15 and above (van Oudheusden et al., 2015; Zins & Weill, 2016). The latest version was published in 2017 and includes 784 different variables, divided into five main indicators representing the financial inclusiveness of a country, namely (1) account used for government payments, (2) accounts used for private-sector wages and for (3) sending or receiving remittances, (4) accounts with the purpose to pay from people to business and lastly (5) accounts used for other payments for work (World Bank, 2018).

To further account for contextual factors within the political and economic environment, I include indicators from the World Bank's Women, Business and Law database (WBL) from 2017. This database provides a detailed overview of the legal differences between genders in 190 countries (World Bank, 2021). Specifically, the WBL measures the laws and regulation within eight dimensions including, for example, pay, entrepreneurship, workplace, marriage and assets. These indicators are unweighted averages of four to five dummy variables each, creating a score out of 100. The database aims to measure the equality of economic opportunities, which is essential for the estimation of female economic achievement. Since the SIGI overlaps with the WBL in measurements of mobility, marriage and assets and entrepreneurship, these indicators are excluded.

4.2.1 Variable Construction & Measurements

Dependent Variables

Female Economic achievement, as the outcome of WEE, is measured through the same variables as in the first stage analysis. Therefore, economic achievement is proxied by the World Bank's Enterprise Survey, given the percentages of female participation in ownership, female top manager and permanent full-time workers.

Independent Variables

Following the precise definition of financial inclusion, I utilise three variables from the Findex (World Bank, 2018). The first variable represents the national percentage of females above the age of 15 having a mobile money account and the second enumerates the national percentage of females above the age of 15 who have a financial institution account. Additionally, I include indicators of the percentage of females above the age of 15 who borrowed at a financial institution.

Control Variables

Similarly to Stage (1) analysis, agency is being represented by the subindexes of the OECD's SIGI. However, this time the index for "restricted resources and assets" is excluded given its overlap with the financial inclusion indicators and the entrepreneurship measurement of the WBL. Furthermore, the ILO model estimate of the employment-to-population ratio for women aged 15-24 are added to control for any co-benefits of empowerment. In addition, I introduce a variable measuring female life expectancy at birth in years from 2017, which is used as a proxy for female health (World Bank, 2021). Lastly, accounting for contextual factors three indicators from the Women, Business and Law database are included. The entrepreneurship indicator measures the legal restriction on women registering a business on their own. Items, for instance, include questions such as "Can a woman sign a contract in the same way as a man?" and are scaled given 1=yes and 0=no like all the others. Furthermore, the "pay" indicator measures whether there are legal differences affecting women's wages such as "Are women able to work in the same industries as men?". Lastly, I control for workplace discrimination, which measures items such as "Does the law prohibits discrimination in employment based on gender?" (World Bank, 2021b).

4.2.2 Limitations and Issues

Given that Stage 1 and 2 share multiple variables and thereby data sources, the limitations and challenges are similar as well. Next to the difficulty of measurement levels, small sample size and the limitations of aggregated agency estimates, Stage 2 further encounters issues with the Findex. Even though the Findex is often used in worldwide cross-country analysis, Zins and Weill (2016) argue that financial inclusiveness in regions such as SSA cannot be accurately measured with the standard, formal indicators that are used for regions such as Europe or South Asia. However, as I extended the definition of financial inclusion towards mobile money adoption, the Findex supplies an adequate data source (Demirgüç-Kunt, Klapper & Singer, 2013).

4.3 Stage Three: WEE and Financial Inclusion on a Micro Level

To better understand the relationship studied on an aggregated level, I will investigate the same relationship, which was studied in Stage 2, between financial inclusion and WEE on a micro-level in Cameroon, Guinea, Nigeria and Benin. The reasons for studying these West African countries are twofold. First, given the region's substantial experience with the Atlantic slave trade, the western SSA suffered from unbalanced demographics and ensuing gender norms, which bring forth a challenging, yet interesting context for WEE research. Secondly, Cameroon, Guinea, Nigeria and Benin are countries with similar gender and human development rankings, colonial pasts, country characteristics and economic structures, as can be observed in [Table 1](#) (UNDP, 2021; World Bank, 2021)

Table 1) Country Comparison

| | GDP per Capita in 2017 | Age Dependency Ratio (Young) | Female Headed Households | Gender Development Index |
|----------|------------------------|------------------------------|--------------------------|--------------------------|
| Cameroon | 1425 US\$ | 77.142 % | 29.53 % | 0,864 |
| Benin | 1136 US\$ | 77.399 % | 23.11 % | 0,855 |
| Guinea | 855 US\$ | 81.051 % | 17.08 % | 0,817 |
| Nigeria | 1968 US\$ | 81.553 % | 22.49 % | 0,881 |

Utilising the Demographic Health Survey program (henceforth DHS) micro-data from the US aid agency, I investigate individual record responses of women between the ages of 15 - 49. The individual-level female dataset shows one record for every eligible woman who slept in the

household the night before the questionnaire was administered. The DHS is a nationally representative household survey that has been collected since 1984 and includes over 400 survey's from around 90 countries (DHS, 2021). Table V in Appendix A summarises all the chosen variables from the DHS dataset, which will be tested for Cameroon, Guinea, Nigeria and Benin for the year 2018. The questionnaire's aims to create and sample internationally comparable indicators. As mentioned in the literature review, the measurement of female economic empowerment needs to use individual-level data instead of household-level records. Using the Individual Recode from the DHS allows for these distinctions, and is one of the main reasons for its applicability here. In the Individual Recode, the unit of analysis is the de facto woman interviewed. It provides indicators for a range of topics including fertility, birth records, health, women's empowerment, domestic violence and financial account ownership, which makes the DHS the only dataset needed for the micro-level analysis, thereby providing consistency. Most of the survey items are categorical, including yes/no dummies as well as multipart questions. Furthermore, the DHS includes count data on the general characteristics of the female survey respondents such as level of education, wealth and marital and employment status (DHS, 2021). Most importantly, the DHS provides variables that make it possible to distinguish between WEE's agency and achievement. Previous works have measured aspects of WEE using the DHS, with sufficient consistency (see Rettig, Fick & Hijmans, 2020; Hanmer & Klugman, 2016; Miedema, Haardörfer, Girard & Yount, 2018; Asaolu, Alaofè, Gunn, Adu, Monroy, Ehiri, Hayden & Ernst, 2018; Jennings, Na, Cherewick, Hindin, Mullany, & Ahmed, 2014; Kishor & Subaiya, 2008). Based on their work and specifically the research by Hanmer & Klugman (2016) and Miedema et al. (2018), the indicators representing agency included in this analysis are tolerance to wife beatings, decision-making ability on household spending, freedom of mobility and ability to make reproductive choices. The descriptive statistics for each country can be viewed in Appendix A (Table IV a-d).

4.3.1 Variable Construction & Measurements

Dependent Variable

On a micro level, the DHS provides commonly used indicators for economic achievement, which are in agreement with the definitions proposed by Buvinic et al. (2020). Using their theoretical framework and following the variable construction methods recommended by Rettig, Fick & Hijmans (2020), Hanmer and Klugman (2016), Miedema et al. (2018) and Asaolu et al. (2018), I can sufficiently construct variables for economic achievement. Nonetheless, the range of item

characteristics provided by the survey makes it impossible to assemble a single outcome variable. Therefore, I proxy economic achievement by household wealth, asset ownership, type of earnings and employment status.

The wealth index is a measurement for income, which is derived from all household assets recorded in the household survey, which are given a weight generated through principal components analysis (DHS, 2021). These standardised scores include 1="poorest", 2="poorer", 3="middle", 4="rich" and 5="richest". Secondly, as proposed by Doss et al. (2015), I construct a summary indicator that shows whether a woman owns land or a house. The precise codings and sources can be viewed in [Table V](#) (Appendix A). Thirdly, the type of earnings, as well as the employment status, is used as an additional proxy for WEE. The item measuring whether the female response is currently working is decoded as 0 = "No" and 1 = "Yes".

Independent Variables

The DHS provides two dummy variables proxying for financial inclusion, namely whether the female respondent has an account in a bank or other financial institution and whether she uses a mobile telephone for financial transactions. Both variables are dummies with 1 = "yes" and 0 = "no" ([Table V, Appendix A](#)).

Control Variables

Similar to Stage 2, this level of analysis tries to distinguish between the *outcome* and the *process* of empowerment, therefore I separate economic achievement (which is the dependent variable) and agency. The DHS enables agency to be constructed of six indicators, as referenced in [Table V](#), in Appendix A. As discussed before, Hanmer and Klugman (2016) clearly distinguish between agency and empowerment using the DHS dataset, which is based on the work of Kabeer (1999). Following their example, I proxy agency by the respondent's ability to make household decisions, her attitudes towards wife-beating, her age at first intercourse, her experience with sexual violence and whether she has the freedom to make choices when it comes to her sex lives. Detailed codings and sources are included in the appendix ([Table V, Appendix A](#)). Furthermore, similar to Miedema et al. (2018) and Rettig et al. 's work (2020), I control for household and spousal characteristics. The variables for education, age, religion, whether the household practices polygamy, the sex of the household head and whether the households in rural or urban are controlled for.

4.3.2 Limitations and Issues

Even though the DHS provides one of the most extensive data collection on female empowerment on an individual level, it is not without shortcomings. Schatz and Williams (2012) and Upadhyay and Karasek (2012) argue that the survey items are based on the South Asian context, which cannot be generalised to the sub-Saharan environment, as women are experiencing disempowerment differently there. Heckert and Fabic (2013) test the DHS's validity in the four SSA countries and find that, indeed, WEE exhibits measurement difficulties when it is placed in a diverse context. However, as long as the item selection is consistent within the context, which is assumed given the results from Miedema et al. (2018), the data from the DHS data are adequate. Moreover, Heckert and Fabic (2013) highlighted that even though the DHS has its limits, they fulfil the need to sufficiently measure female economic empowerment. Furthermore, the DHS only includes heterosexual women in their reproductive age (15-45 years), skewing any results towards the younger population (Laszlo et al., 2020). Acknowledging this in the interpretation of results is crucial and further research on including a broader category of women is advised. As suggested by Buvinic et al. (2020) the *outcome* of WEE, economic achievement, can be measured by income, however, the DHS only provides income measured for the household and not for the individual, making the Wealth Index a weak indicator for this analysis. This gives to reason why employment, type of earnings and ownership of assets have been included as additional dependent variables. Lastly, the survey responses of the process of empowerment are sometimes filled-out by the husband instead of the wife, biasing the results (Miedema et al., 2018). Given the static analysis of only one survey year, the DHS only provides a snapshot of WEE and therefore does not indicate any temporal changes, which would be an even better and more comprehensive analysis.

5. Methodology & Empirical Strategy

The quantitative analysis is conducted in two parts. Continuing the top-down procedure, I first analyse stage 1 and 2 on a macro, cross-country level in 30 Sub-Saharan economies using an ordinary least squared (OLS) regression. Subsequently, utilising the DHS micro-data discussed above, I investigate the context-specific mechanisms of the WEE framework in Cameroon, Guinea, Nigeria and Benin (Stage 3). Given the variable characteristics of the survey, I use Negative Binomial, Poisson and Logistic regressions. The model equations for Stage 2 and 3 are derived and adapted from a collection of works including Buvinic et al. (2020), Ibrahim and Alkire (2007), Hanmer and Klugman (2016) as well as from the structural equation model by Ballon (2018). The first stage model equation is based on the works of Diebolt and Perrin (2013) which has been modified according to the data.

5.1 Stage One Model Equation

First, I present an OLS regression model that estimates the relationship between WEE and GDP per capita. The association will be tested in 30 SSA countries. The econometric model equation states as follows:

$$\hat{y}(GDPpc_i) = \hat{\beta}_1 + \hat{\beta}_2 EA_i + \hat{\beta}_3 agency_i + \hat{\beta}_5 M_i + \hat{\beta}_6 LFP_i + \hat{\beta}_7 ETP_i + \hat{e}_i$$

The dependent variable is GDP_i per capita in 2017 in country i . EA_i , coded for female economic achievement, represents the *outcome* of Women's Economic Empowerment, measured in the percentage of female workers, female manager and female business owners in a country. $Agency_i$ as the process of WEE, stands for the five sub-indexes of the Social Institution and Gender Index, which includes measurements regarding a woman's discrimination in the family, restricted physical integrity, restricted resources and assets, son biases and restricted civil liberties. LFP_i measures the female labour force participation rate in the year 2017 and ETP_i measures the female employment-to-population ratio. Lastly, controlling for other gender variables, M_i includes a measurement for polygyny, and for the aggregated female life expectancy rate.

Assumption testing and Robustness checks

Given the data presented in the previous chapter, a core limitation of this OLS regression is the amount of observations. With N=30 the requirements for using the ordinary least squares approach are fulfilled but the reliability of results have to be questioned, especially if there are outliers. Therefore, I take the logarithm of GDP per capita in order to minimise the distribution resulting from outliers. Graphically, the Kernel Density Estimation ([Graph 1, Appendix B](#)) and Residual Normal Quantiles Plot ([Graph 2, Appendix B](#)) show satisfying normality. The Skewness/Kurtosis ($\text{Chi}^2 = 0.87$ $p=.6472$) and Jarque-Bera ($\text{Chi}^2 = .7672$; $p=.6814$) tests confirm this, fulfilling the normality assumption. There is also no multicollinearity between the variables, given that the variance inflation factor for each variable was within acceptable norms ($\text{VIF} < 5$). Furthermore, the Breusch-Pagan / Cook-Weisberg test for heteroscedasticity, upholds satisfactory standards given $\text{Chi}^2=.04$ and $p=.8382$, therefore homogeneity of variance is assumed. Lastly, given the small number of degrees of freedom when including both the process and outcome of WEE, I chose to test for their effects separately, thereby providing a more robust model. When doing so the results are not notably different, allowing me to make this differentiation.

5.2 Stage Two Model Equation

Secondly, the mechanisms behind the first model are explored by estimating the relationship between financial inclusion and WEE, whilst accounting for the dynamics between agency and economic achievement. I use the aggregated country-level data explored in the previous chapter in 30 SSA countries, for which the econometric model equates as:

$$\hat{y}(EA_i) = \hat{\beta}_1 + \hat{\beta}_2 FA_i + \hat{\beta}_3 agency_i + \hat{\beta}_4 LFP_i + \hat{\beta}_5 ETP_i + \hat{\beta}_6 LD_i + \hat{\epsilon}_i$$

The dependent variables are measurements for EA_i , which similarly to the first stage model are variables representing the percentage of (1) female workers, (2) female managers and (3) female business owners in country i . FA_i stands for the three indicators proxying financial inclusion, namely mobile money and formal account ownership as well as formal borrowing usage. Following Stage 1, $agency_i$, as the *process* of WEE represents subindexes of the SIGI, however, the subindex for restricted resources and assets is excluded given that it overlaps with measurement for financial

inclusion. Lastly, I control for the female labour force participation rate (LFP_i), female employment-to-population ratio (ETP_i) and legal discrimination in the workspace, and when it comes to payment and ability to open a business (LD_i).

Assumption testing and Robustness checks

For the models to draw reliable conclusions, they need to fulfil the assumptions of multicollinearity, normality and homoscedasticity. Across all models, there are no issues with multicollinearity and homoscedasticity. Testing for the dependent variable on female business ownership, the Kernel density estimation ([Graph 3, Appendix B](#)) and the Normal Quantiles Plot ([Graph 4, Appendix B](#)) do not provide evidence of normalcy but of skewness. However, the Skewness/Kurtosis ($\text{Chi}^2 = .21$; $p = .9007$) and Jarque-Bera ($\text{Chi}^2 = .813$; $p = .4141$) tests deliver no signs of non-normality, fulfilling the normality assumption. Furthermore, testing for heteroscedasticity, the Breusch-Pagan / Cook-Weisberg test result indicates constant variance. There are also no signs of multicollinearity given $VIF\ 3.84 < 5$. Similarly, by testing the model assumptions for female full-time workers, the assumptions for multicollinearity, normality and homoscedasticity are fulfilled. Even though Kernel density ([Graph 5, Appendix B](#)) and the Normal Quantiles Plot ([Graph 6, Appendix B](#)) show non-normalcy, the Skewness/Kurtosis ($\text{Chi}^2 = 1.4$; $p = .4974$) and Jarque-Bera ($\text{Chi}^2 = 1.107$; $p = .5751$) are insignificant, implying a normal distribution. The tests for heteroscedasticity and multicollinearity also do not indicate any assumption violations. Lastly, I test for the residual distribution of the model when the dependent variable equals the percentage of female business managers. Given the severely skewed data, I derive the logarithms of the variable, which then provides me with satisfied OLS model assumptions. Specifically, the Jarque-Bera ($\text{Chi}^2 = 1.026$; $p = .5988$) and Skewness/Kurtosis ($\text{Chi}^2 = 1.09$; $p = .5804$) show that the residuals are normally distributed (also see [Graph 7](#) and [Graph 8](#) in Appendix B). Neither heteroscedasticity nor multicollinearity are an issue in this model.

5.3 Stage Three Model Equation

Third and last, the second stage regression is repeated on a micro-level in Cameroon, Benin, Guinea and Nigeria for the year 2018. Hereby, the female individual-level survey responses are tested using a Negative Binomial, Poisson and Logistic regression, for which the general equations are

expressed as follows:

$$\hat{y}(WEA_i) = \hat{\beta}_1 + \hat{\beta}_2 \text{financialinclusion}_i + \hat{\beta}_3 \text{individual}_i + \hat{\beta}_4 \text{control}_i + \hat{\beta}_5 \text{attitudewifebeating}_i + \hat{\beta}_6 \text{sexdecision}_i + \hat{\beta}_7 \text{household}_i + \hat{\epsilon}_i$$

The dependent variables represent measurements of WEA for individual i , which for the negative binomial regression is (1) asset ownership, (2), for Poisson regression are wealth index and (3) the respondent's type of earning and for the logistic regression is (4) the dummy for whether the female is employed or not. Agency is measured by control (control_i), attitudes towards wife-beating ($\text{attitudewifebeating}_i$) and sexual decision-making abilities (sexdecision_i), with the latter one representing multiple variables namely, the respondent's age at first intercourse, her experience with sexual violence and whether she can ask for a condom. Financial inclusion represents two dummy variables for whether the respondent has an account at a financial institution and whether she uses a mobile telephone for financial transactions. The individual variables correspond to the respondent's religion, age, education and marital status. Lastly, controlling for household-level dynamics, household_i epitomises whether the household includes a polygenic relationship, the gender of the household head and the region of the household (dummy for rural or urban).

Assumption testing and Robustness checks

Using the right approach to accurately estimate count data is crucial, especially given the fact that I use four different proxies for economic achievement, each with different dispersions. The dummy for employment, given its dichotomous Yes/No categories to whether the woman is employed, facilitates the use of a Logistic regression, which uses the cumulative distribution function of the logistic distribution. For the remaining three dependent variables, I use Poisson and negative binomial regressions, which is an extension of the Poisson regression, as they are suitable for modelling over-dispersed count variables. In the case of Asset Ownership, [Graph 9](#) (Appendix B) shows that the negative binomial probability curve more accurately fits the count data than the Poisson probability curve, thereby implying its applicability and goodness of fit. This does not apply to the remaining two dependent variables, which can also be confirmed by their alpha-values when running a negative binomial regression, which in both cases was below 0. Therefore, both the Wealth Index as well as the Type of Earnings variable are to be estimated using Poisson regression. Given the significant p-value of the overall model, I can substantiate the model's statistical

significance, showing that all of the estimated coefficients are equal to zero. Lastly, checking for the goodness of fit of the two models for Wealth and Type of Earning, I use Stata's goodness-of-fit chi-squared test which is statistically insignificant, indicating a good model fit.

5.4 Limitations of the Empirical Strategies

In this analysis, there are several sources for error. All three stages can be considered static, as they all only look at a single year, either 2017 or 2018, which restricts any assumptions made about temporal changes. This may be counterintuitive as WEE is a *process* as well as an *outcome* and thereby implies change. However, the intention was to provide a snapshot of the current situation in SSA. I avoided the compression of history critique by only including the most up-to-date data available, with no data source older than 2009. For the most part, the variables are collected in the same year limiting the bias. Furthermore, and as already touched upon in the data section, most WEE measures, regardless of whether they measure the process or the outcome are proxied.

6. Empirical Analysis

I present my results for each of the three stages below. By investigating the relationships between economic development, financial inclusion and the mechanism of female empowerment I study the following hypothesis:

Stage 1 Hypothesis

H1: The process and outcome of Female Economic Empowerment increase national income.

H0: The process and outcome of Female Economic Empowerment does not impact national income

Stage 2 Hypothesis

H2: On a macro-level, Financial Inclusion increases Female Economic Empowerment measured using three indicators:

(a) ... the percentage of firms with female participation in ownership.

(b) ... the proportion of permanent full-time workers that are female.

(c) ... the percentage of firms with a female top manager.

H0: On a macro-level, Financial Inclusion does not impact Female Economic Empowerment

Stage 2 Hypothesis

H3: On a micro-level, Financial Inclusion increase Female Economic Empowerment measured using three indicators:

(a) ... female asset ownership

(b) ... household wealth.

(c)female employment

(d) ... female earnings paid in cash payments.

H0: On a micro-level, Financial Inclusion does not impact Female Economic Empowerment

Each hypothesis responds to its corresponding analytical stage, meaning that hypothesis 1 and 2 are tested on an aggregated, cross-country level in 30 sub-Saharan African countries and hypothesis 3 is tested on an individual level in Cameroon, Benin, Guinea and Nigeria.

6.1 Results

Following the empirical strategies presented in the previous chapter, the following stages utilise OLS, Negative Binomial, Poisson and Logistic regressions. Only some of the output tables are included in this chapter, for the remaining ones refer to Appendix C.

6.1.1 Stage One: WEE and Economic Development

Table 2 shows the estimated association between WEE and economic development. The first two columns show the *outcome* of WEE (economic achievement), where Column 1 is the baseline specification and Column 2 includes the baseline and control variables. The last two columns present the *process* of WEE (agency), where Column 3 includes only the baseline model which gets extended to the control variables in Column 4. Apart from the percentage of female workers, none of the models provide any significant results.

Table 2) OLS Regression for Stage 1

| STAGE 1: RELATIONSHIP BETWEEN FEMALE ECONOMIC EMPOWERMENT AND INCOME | | | | | |
|--|---------------------|------------------------|------------------------|---------------------|-------------------------|
| Dependent Variable is log of GDP per capita in 2017 | | | | | |
| Female Business Ownership | 0.0118 (0.0150) | 0.00502 (0.0112) | 0.0104 (0.0130) | | |
| Female Business Manager | 0.00236 (0.0261) | -0.00317 (0.0176) | 0.00330 (0.0227) | | |
| Female Fulltime Workers | 0.00303 (0.0225) | 0.0297* (0.0161) | 0.00937 (0.0198) | | |
| Physical Integrity | | | -0.211 (0.565) | -0.387 (0.691) | -0.469 (0.464) |
| Restricted resources and assets | | | 0.367 (0.681) | 0.831 (0.845) | 0.280 (0.535) |
| Restricted civil liberties | | | -0.848 (0.563) | -0.323 (0.651) | -0.842 (0.490) |
| Discriminatory family | | | 0.948 (0.820) | -0.0311 (0.781) | 0.572 (0.681) |
| Physical Integrity | | | 0.906 (0.940) | 1.522 (1.193) | 1.379 (0.800) |
| Female Life Expectancy | | 0.0491* (0.0245) | 0.0403 (0.0281) | | 0.0257 (0.0240) |
| Female Employment | | -0.0175** (0.00799) | -0.0180 (0.0109) | | -0.0131 (0.00890) |
| Female-to-male Labour Force Participation Rate in 2017 | | -0.00766 (0.00935) | 0.00438 (0.0137) | | 0.00234 (0.0121) |
| Rural-to-urban Ratio in 2017 | | -0.0209** (0.00749) | -0.0246** (0.00880) | | -0.0272*** (0.00791) |
| Polygyny | | 0.0148 (0.0180) | 0.00952 (0.0220) | | -0.00513 (0.0172) |
| Constant | 6.477*** (0.459) | 5.454*** (1.844) | 5.252* (2.850) | 6.605*** (0.659) | 7.393*** (2.039) |
| Observations | 30 | 30 | 30 | 30 | 30 |
| R ² | 0.052 | 0.696 | 0.765 | 0.139 | 0.745 |

Standard errors in parentheses
 *** p<0.01 ** p<0.05 * p<0.1

In Column 2, the independent variables explain 69.6% of the variance in the logarithm of GDP per capita, as the coefficient of determination accounts for $R^2 = .696$. Whilst controlling for country-specific variables, higher percentages of female full-time workers in non-agricultural, private companies is significantly correlated to the logarithm of GDP per capita in 2017 ($B = .0297$; $p < .1$). As the percentage of female workers in private business increases by one unit, the GDP per capita increases by 2.97%, holding everything else constant. Contradictingly, the female employment-to-population ratio is negatively associated with national income ($B = -.0175$; $p < .05$), where a unit increase in the ratio corresponds to a 2.29% decrease in GDP per capita. Column 4 includes the five measures of the SIGI representing agency, which single-handedly explain 13.8% of the variance in the logarithm of GDP per capita ($R^2 = .138$), but do not yield any significant association below the 10% significance level. Even though one of the economic achievement variables has a relationship with income on the 5% significance level, it is not enough to reject the null hypothesis at this stage. Therefore, the process and outcome of WEE, given my measurement methods, do not have a statically significant impact on a country's national income.

6.1.2 Stage Two: WEE and Financial Inclusion on a Macro Level

The results for the second stage are shown in [Table 3](#) (below) and in Appendix C, for which the relationship between economic achievement and financial inclusion are estimated. The dependent variables proxying economic achievement are the percentage of female business ownership, the logarithm of female business manager and female full-time workers for [Table 3](#), I and II, respectively.

[Table 3](#) presents the percentage of female business owners and includes a sample of 30 SSA countries. In the first column, I find a significant relationship between mobile money adoption and the percentage of firms with female ownership ($B = 28.56$; $p < .05$). This significance is also found in the second column, where formal account ownership and usage of formal borrowing are excluded ($B = 33.91$; $p < .1$). Column 3 and 4 provide no significant results, indicating formal account ownership and the usage of formal borrowing does not correlate with female business ownership. Given these regression results, I can confidently reject the null hypothesis (H_0a) hypothesis, given that mobile money has a positive effect on the percentage of female business ownership in private-sector companies. Interestingly, agency in the form of discrimination within the family and physical integrity has a significant, negative relationship with the percentage of female business owners. If

the “Discriminatory family” variable increases (meaning the discrimination against women increases) by one unit, the percentage of the female business ownership decreased by 41.73 (Column 1, given B=41.73; p<.05).

Table 3) OLS Regression for Stage 2

| STAGE 2: RELATIONSHIP BETWEEN FINANCIAL INCLUSION AND FEMALE ECONOMIC ACHIEVEMENT | | | | |
|---|---------------------------|----------------------|---------------------|---------------------|
| | Female Business Ownership | | | |
| Physical Integrity | -15.04 (11.20) | -19.85** (8.806) | -18.44* (9.586) | -19.30* (11.02) |
| Discriminatory family | -41.73** (15.26) | -43.70*** (13.06) | -32.86** (15.21) | -45.50** (17.15) |
| Restricted civil liberties | 9.633 (9.380) | 8.870 (8.114) | 5.191 (8.175) | 2.714 (8.265) |
| Son Bias | -2.494 (18.03) | -7.890 (17.40) | 6.823 (16.12) | 13.59 (19.04) |
| Mobile Money Account | 28.56** (12.36) | 33.91* (16.78) | | |
| Financial Institution Account | 19.60 (21.55) | | 26.22 (20.23) | |
| Formal Borrowing | -50.64 (72.66) | | | -44.84 (101.9) |
| Female-to-male Labour Force Participation Rate in 2017 | -0.449** (0.201) | -0.442* (0.249) | -0.380 (0.261) | -0.390 (0.272) |
| Female Employment | 0.397** (0.177) | 0.333* (0.159) | 0.330* (0.175) | 0.258 (0.171) |
| Legal differences in ... | | | | |
| ... Entrepreneurship | -0.0807 (0.149) | -0.0703 (0.131) | -0.0898 (0.139) | -0.168 (0.156) |
| ... Pay | 0.0378 (0.0846) | 0.0373 (0.0746) | 0.0646 (0.0765) | 0.110 (0.0810) |
| ... Workplace | -0.142* (0.0810) | -0.148* (0.0811) | -0.114 (0.0831) | -0.101 (0.0866) |
| Constant | 84.28*** (23.56) | 91.74*** (24.00) | 77.63** (28.63) | 99.43*** (28.13) |
| Observations | 30 | 30 | 30 | 30 |
| R ² | 0.644 | 0.623 | 0.580 | 0.547 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table I (Appendix C) the dependent variable is the logarithm of the percentage of female business managers. In all four columns, there is a strong negative relationship between a woman’s physical integrity and the percentages of female business managers. Depending on which financial tool is focused on the coefficient of Physical Integrity varies between B= -1.111 and -1.392 with an overall significance level of at least 5%. Based on column 4, if the level of discrimination in a woman’s physical integrity increases by one unit, the percentage of female managers in private companies decreases by 1.026 % (B=-1.026; p<.1) holding all other variables constant. Lastly, there is a negative association between the legal differences in entrepreneurship and the log of female business managers. As seen in Column 1, if the legal barriers for women entrepreneurs increase by one unit, the percentage of female business managers decreases by .987% (B=-.00987; p<.1). Despite these results, there are no significant relationships between any of the three measurements

of financial inclusion and the logarithm of percentage of female business leaders, regardless of whether they are measured together (Column 1) or separately (Column 2,3 & 4). Therefore, I cannot reject the null hypothesis (H0b), which means that financial inclusion does not have a direct influence on this measurement of economic achievement.

Lastly, [Table II](#) (Appendix C) shows the results for the relationship between the percentage of full-time female workers in private-sector companies and financial inclusion whilst controlling for agency. All models depict a significant association between the percentage of full-time workers and the physical integrity sub-index, with coefficients between -16.91 and 18.90 ($p < .05$). Furthermore, the legal discrimination of women in the workplace and the dependent variable exhibits a negative relationship on a 5% significance level ($B = -.114$; $p < .05$). Given these results from Column 1, if a woman's legal workplace discrimination increases by one unit, the percentage of female full-time workers decrease by .114%, respectively, with all else being constant. Similarly to the previous regression, there are no statistically significant relationships between any of the three financial inclusion variables and the percentage of female workers, which means I cannot reject the null hypothesis (H0c).

6.1.3 Stage Three: WEE and Financial Inclusion on a Micro Level

The micro-level Negative Binomial, Poisson and Logistic regressions are shown in [Table 4](#) for Benin and [Table III](#) for Nigeria, [Table IV](#) for Cameroon and [Table VI](#) for Guinea (Appendix C). Across all tables, the models in column 1 is tested using a negative binomial regression, column 2 and 4 are tested using a Poisson regression and the third regression is estimated using logistic regression.

The regression outputs for Benin are exhibited in [Table 4](#) (full regression in [Table V](#), Appendix C), including 2638 individual responses. Economic achievement is proxied by a female's asset ownership, employment status and the type of her earnings as well as the household's wealth index. The results show that the dummy for financial account ownership is positively associated with all economic achievement variables on a 1% significance level. Mobile money usage, however, is only directly affecting the household's wealth index ($B = .101$; $p < .01$). Nonetheless, within the context of Benin, I can reject all null hypotheses (H3a -H3d) for stage 3. Further exploring the dynamics of WEE, [Table 4](#) presents various significance levels between agency and the dependent variables. An

increase in a woman's decision-making abilities is often correlated to an increase in female asset ownership and employment. In the context of Benin, increasing the decision-making abilities of women to visit family and friends decreases asset ownership ($B=-.0747$; $p<.05$), even when all other dimensions of decision-making are positively related to economic achievement. Furthermore, women who believe that wife beatings can be justified in at least one instance (in comparison to women who do not believe wife beatings are ever justified) are more likely to have improved types of earnings ($B=.0533$;

Table 4) Negative Binomial, Poisson and Logistic Regression for Stage 3

| STAGE 3: RELATIONSHIP BETWEEN FINANCIAL INCLUSION AND ECONOMIC ACHIEVEMENT IN BENIN | | | | |
|---|--------------------------------------|-------------------------|-----------------------|-----------------------------|
| VARIABLES | Negative Binomial Asset Ownership | Poisson Wealth Index | Logistic Employed | Poisson Type of Earnings |
| Financial Institution Account | 0.639*** (0.110) | 0.0478*** (0.0145) | 1.109*** (0.272) | 0.0480*** (0.0146) |
| Uses Mobile Money | 0.0101 (0.108) | 0.101*** (0.0126) | 0.176 (0.168) | 0.0177 (0.0144) |
| Who decides ... | | | | |
| ... her healthcare choices | 0.162** (0.0769) | 0.0102 (0.0114) | 0.440*** (0.132) | 0.00818 (0.0121) |
| ... the household spending | 0.139* (0.0791) | 0.0206 (0.0126) | 0.585*** (0.144) | 0.0245* (0.0138) |
| ... on visits to family & friends | -0.0747** (0.0363) | 0.00783 (0.00664) | 0.0933* (0.0547) | 0.0176** (0.00734) |
| ... what to do with money husband earns | 0.123* (0.0672) | -0.00673 (0.0100) | 0.0654 (0.116) | -0.00524 (0.0103) |
| Attitude towards wife beating | 0.0252 (0.0839) | -0.0495*** (0.0147) | 0.183 (0.128) | 0.0533*** (0.0136) |
| Can she refuse sex? | 0.0201 (0.0929) | 0.00317 (0.0155) | 0.325** (0.142) | 0.0264* (0.0152) |
| Can she ask for condom? | -0.0883 (0.0901) | 0.0526*** (0.0148) | -0.170 (0.140) | 0.00266 (0.0144) |
| Age at first intercourse | -0.0184 (0.0158) | 0.0142*** (0.00219) | 0.0581*** (0.0214) | 0.00262 (0.00235) |
| Highest Education achieved | | | | |
| Primary | -0.170 (0.106) | 0.117*** (0.0157) | -0.0511 (0.164) | 0.0182 (0.0156) |
| Secondary | -0.184 (0.113) | 0.155*** (0.0151) | -0.659*** (0.156) | 0.0181 (0.0171) |
| Higher | -0.219 (0.256) | 0.149*** (0.0204) | -1.758*** (0.373) | 0.0295 (0.0243) |
| Living with partner/husband | -0.0841 (0.0993) | -0.00442 (0.0140) | 0.0344 (0.151) | 0.0187 (0.0134) |
| Female head of household | -0.263*** (0.102) | -0.0225 (0.0145) | 0.224 (0.178) | 0.00181 (0.0141) |
| Polygyny | 0.354*** (0.0786) | 0.0180 (0.0134) | 0.451*** (0.132) | -0.00417 (0.0136) |
| Rural | 0.283*** (0.0821) | -0.226*** (0.0139) | 0.122 (0.124) | -0.0566*** (0.0137) |
| Religion (excluded) | | | | |
| Ln(alpha) | -0.318** (0.147) | | | |
| Constant | -1.475*** (0.357) | 0.919*** (0.0574) | -1.267** (0.539) | 0.812*** (0.0567) |
| Observations | 2,638 | 2,638 | 2,638 | 2,294 |

Robust standard errors in parentheses
 *** $p<0.01$, ** $p<0.05$, * $p<0.1$
 (Note: Number of observations vary across regressions)

$p<.01$) but are, at the same time, prone to be in a lower wealth group ($B=.0495$; $p<.01$). All significant relationships between the dependent variables of measurements of sexual decision-

making have a positive correlation, meaning that when her sexual decision-making ability increases, so does her economic achievement. Whilst education is positively related to the household's overall wealth, it is negatively related to both asset ownership and employment. Lastly, household-level dynamics such as polygyny (in comparison to single-wife households) have a positive relationship to female asset ownership ($B=.354$; $p<.01$) and employment ($B=.451$; $p<.01$). Women living in a rural instead of urban household are more likely to own assets ($B=.283$; $p<.01$) but are more likely to belong to poorer wealth groupings ($B=-.226$; $p<.01$) and have restricted access to cash ($B=-.0566$; $p<.01$).

In [Table IV](#) (Appendix C), the micro-level results for Cameroon are presented, which include up to 4197 observations. The dummy for having a financial institution account has a positive relationship to all the variables of female economic achievement. Specifically, it is to be noted that account ownership has a relatively considerable influence on whether the respondent is employed or not ($B=.543$; $p<.01$). Moreover, the usage of mobile money positively affects the household wealth index ($B=.096$; $p<.01$) and the individual's type of earnings ($B=.0991$; $p<.01$). Hence, I can confidently reject all third-stage null hypotheses (H3a -H3d) in the case of Cameroon. Furthermore, we see multiple agency measurements correlating with the dependent variables. The considerable impact of sexual decision making represented by the ability to refuse sex and ask for a condom on the direction of the respondent's employment status, given $B=.437$ and $B=-.364$, respectively, is important to notice. Moreover, education takes on a crucial role in the *outcome* of WEE in Cameroon, where most of the female education levels positively influence various economic achievement variables. The results in [Table IV](#) also indicate that living in cohabitation with a partner/spouse decreases the woman's asset ownership by a rate of .414 given $B=-.414$ and $p<.01$. Investigating the household characteristics, the results show that having a female head of household is negatively correlated to the wealth index ($B=-.0518$; $p<.01$) and the type of earnings ($B=-.0459$; $p<.05$). Respondents who reported their husband being in a polygynous relationship also indicated that higher asset ownerships ($B=.299$; $p<.01$) and lower types of earnings ($B=-.0807$; $p<.01$). Lastly, even though women in rural settings have a bigger impact on asset ownership ($B=.428$; $p<.01$) and employment ($B=.577$; $p<.01$), they are less likely to score high on the wealth index ($B=-.359$; $p<.01$) or receive improved type of earnings (e.g more cash, less in-kind payments).

[Table III](#) (Appendix C) shows the results for Nigeria with up to 5467 individual-level observations. Having a financial institution account is positively associated with the household's wealth index and

with the type of earnings a woman receives. Women who have an account are expected to increase their wealth status by a rate of .0936 ($p < .01$) and improve their type of earnings by a rate of .0659 ($p < .01$), which in the latter case leads to more cash instead of in-kind payments. In Nigeria, the usage of mobile money is significantly associated with the household's overall wealth index, where mobile money usage in comparison to non-usage is related to an improvement in wealth by a rate of .0369 ($p < .01$). Given these results, I can reject the null hypothesis for H3a and H3c in Nigeria, however, it is acknowledged that these results are less consequential than in Benin, Cameroon or Guinea. Agency in terms of control over household spending ($B = .120$; $p < .1$), ability to visit relatives ($B = .120$; $p < .01$) and who decides on the husband earnings ($B = .216$; $p < .01$) are positively associated with asset ownership. Specifically, for example, women who are encouraged in their individual decision-making ability to meet friends and family, are more likely to own land and house assets by roughly a rate of 0.120 ($p < .01$). A similar positive association can be observed between decision-making ability and employment. Furthermore, whether the respondent is able to refuse sex, in comparison to women who are not able to do so, increases the potential for her to own assets alone or jointly by a rate of 0.162 ($p < .01$). Women who believe there are instances where wife beatings are justified, also report less household wealth ($B = -.0602$; $p < .01$) and fewer improvements in the type of earnings ($B = -.120$; $p < .01$).

Finally, the results obtained for Guinea are set out in [Table VI](#) (Appendix C). Financial inclusion represented by account ownership and mobile money usage shows various connections with the proxies for economic achievement. Having an account at a financial institution is positively correlated with asset ownership ($B = .554$; $p < .01$) and the dummy for employment ($B = .508$; $p < .1$). Furthermore, respondents who reported using mobile money also reported significantly higher levels of asset ownership ($B = .148$; $p < .01$) and wealth ($B = .0694$; $p < .01$). Given these outputs for Guinea, I can reject the null hypothesis for H3a H3b and H3c but cannot reject it for H3d. The logistic regression revealed that agency in the form of decision-making in healthcare ($B = .461$; $p < .01$) and household spending ($B = -.406$; $p < .01$) are strong predictors of the respondent being employed. The dummy for attitude towards wife-beating is a strong estimator for all dependent variables as they show a significance level of 1%. Unlike in Benin, the relationship between sexual decision-making and the variables for economic achievement is not as clear cut. Even though being able to refuse sex correlates to more assets in her ownership ($B = .320$; $p < .01$) it does not increase the household's wealth ($B = -.0829$; $p < .01$). Contradictingly, if a woman can ask for protective sex the direction of the relationship changes, so that it is negatively associated with asset ownership

($B=-.146$; $p<.05$) and positively related to the household's wealth ($B=.0829$; $p<.01$). Respondents who can ask for sexual protection also report significantly higher employment ($B=.262$; $p<.05$). Similarly to the analysis in Benin, the education achievements of respondents have various significant relationships with the dependent variables, in both positive (wealth index) and negative (asset ownership) directions. Lastly, respondents who are in a polygynous relationship score higher in asset ownership ($B=.194$; $p<.01$).

6.2 Discussion

This study aimed to investigate the relationships between women's economic empowerment, financial inclusion and development. As the outcome of this quantitative analysis has shown, there is no constancy across the three stages. Nonetheless, the top-down approach generated valuable insights into the dynamics of the outcome and process of WEE and its association to financial inclusion and national income on the macro and micro levels. Overall, the multidimensionality and contextuality of WEE have been highlighted in all levels of analysis, meaning that the interpretation of results is not always definite.

It was hypothesised that there is a positive relationship between the process and outcome of WEE and national income per capita. Unexpectedly, the direct relationship between female economic empowerment and national income did not show the convincing results that were seen in works by Blumberg (2005) or Duflo (2012). Despite the fact that increasing female employment has been argued to significantly improve a country's income (World Bank, 2012), my model for Stage 1 was not able to confirm this. Even though more women working full-time in private sector companies is good for the national income per capita, it contradicts the negative effect of the female employment-to-population ratio on national income. This might be caused by the measurements used to quantify agency and economic achievement as they have some limitations. For example, economic achievement, which was measured using the gendered version of World Bank's Enterprise Survey, is biased towards big companies. Within the context of SSA, this can severely limit the effect, since most women work at or own micro-businesses (Maru & Razia, 2013). Although the results of the first stage did not yield a significant direct effect between WEE and national income per capita, the analysis pointed towards other important indirect impacts. As established in the Literature Review, WEE is not just necessary in its own right but also impacts the welfare of broader society. Notably, female health, education and decision-making abilities can directly improve a country's income or

indirectly facilitate increases in employment and human capital accumulation of children. My results show that female life expectancy, which proxied for female health, had a significant effect on GDP per capita. Similar effects have been studied by Bloom et al. (2020), confirmed in my result, which according to their research generates co-benefits such as lowering youth dependency, increase in reproductive decision-making and a rising focus on schooling which decreases the average fertility rate. These, directly and indirectly, impact national income as studied by Bloom et al. (2020) suggest.

The second question in this research was “does financial inclusion facilitate female economic empowerment in sub-Saharan Africa on an aggregated level?”. The findings of this study indicate that there is no relationship between female leadership or full-time workers in private-sector companies and financial inclusion. Only female business ownership and mobile money adoption were statistically significantly correlated. On an aggregated level, these findings are contrary to previous studies which have suggested that there is a strong positive relationship between WEE and financial inclusion (Bhatia & Singh, 2019; Buku & Meredith, 2012; Chew, Ilavarasan & Levy, 2015). There are several possible explanations for this result. Even though my measurements for WEE (including both agency and economic achievement) were grounded in the works of Buvinic et al. (2020), the data must be interpreted with caution. As the proxies for economic achievement were biased, further aggregated data is necessary to account for these distinctions. Whilst the measurements for economic achievement may have been weaker than expected, the stage 2 results provide several important insights into the dynamic between the process and outcomes of WEE. For example, discrimination within the family and legal differences in entrepreneurship is related to the percentage of female business managers. Increasing a woman's physical integrity has a positive impact on the percentage of female business owners and full-time workers. Specifically, improvements in agency in terms of laws on child marriage, laws on household responsibilities, equality of legal rights to inheritance of assets and laws on divorce significantly improves a women's chances to become a business owner. These findings are consistent with the notion that contextual factors and the exercise of agency, as inferred by Buvinic et al. (2020), are in dynamic relation to a woman's economic achievements. In accordance with the literature, the results for stage 2 suggest that contextual factors in the legal sphere, which greatly shape the economic opportunities for a woman, can yield higher outcomes in economic achievement, than for example, financial tools such as account ownership and mobile money. However, it is important to bear in mind this stage was measured on a national level only, biasing the results further.

This bias was avoided in the third and final stage, which dealt with the question “does financial inclusion facilitate female economic empowerment in Cameroon, Guinea, Benin & Nigeria?”. As already mentioned in the Analytical Framework chapter, the micro-stage was expected to be the most accurate and precise empirical analysis of WEE of this thesis. Given the DHS micro-level data, it was possible to record individual responses, which was essential for researching WEE. Whilst economic achievement still is proxied by less-than-perfect indicators, mainly because there is no individual-level income data, the measurements are still meaningful. The most important finding to emerge from the analysis was that there is a strong positive relationship between financial inclusions and the outcome measurements for WEE in all four countries. Specifically, women who have an account at a financial institution are more likely to be employed, own land and houses, get paid in cash rather than in-kind earnings and belong to a higher household wealth group. Mobile money usage, however, was not as strongly connected to economic achievement as previous research suggested. The only consistent positive relationship across Guinea, Benin, Nigeria and Cameroon is between mobile money usage and the household’s wealth grouping. Given the results from Stage 2, this may have been a surprise, considering that the only significant result was between mobile money and formal account ownership. However as [Figure 2](#) & [Figure 3](#) showed, mobile money is the most commonly used financial service in SSA, which might suggest that formal financial inclusion is a more powerful tool when it comes to economic achievement. Therefore, one might argue that mobile money is not the universal solution it is thought to be.

As discussed in the Literature Review, there is a vicious cycle in which financial inclusion improves agency but agency is required to become financially included (Buvinic et al., 2020). Studies have shown that women who are restricted to work, who were married at a young age and have experienced (sexual) violence are less likely to be financially included (Demirgüç-Kunt, Klapper & Singer, 2013), which can be only partially confirmed by my findings. The results of this thesis suggest that wealth and economic achievement do not prevent agency deprivation, which amplifies the reciprocity of Buvinic et al.’s (2020) framework ([Figure 1](#)). Practically, this means that in order to attain economic achievement, one has to receive the right contextual resources (such as financial services) and acquire the ability to exercise one’s agency. If one or the other is not adequately available, the woman can find herself trapped in a vicious cycle. The challenge is to provide sufficient resources and agency simultaneously in order to escape this particular kind of disempowerment trap. Ignoring this exact relationship might have been the issue with cash

transfers, as the policy-makers ignored the multi-dimensionality of WEE. Financial inclusion, under the right conditions, enables women to seize more economic opportunities, earn and own more as well as find employment.

Next to the significant relationship between financial inclusion and economic achievement, several interesting results need to be highlighted. The analysis in Guinea, Benin, Nigeria and Cameroon highlighted the context specificity of WEE, as the dynamics between agency and achievement are not consistent across the four countries. One can observe a variety of associations with some being intuitively contradictory. For example, while in Nigeria most measurements of the agency are generally good for economic achievement, in Guinea they are sometimes at odds with it. Moreover, in Cameroon improvements in a woman's independent decision-making ability are positively related to the achievement variables, whilst advances in her choices regarding sexual health and reproductive rights showed mixed results. A woman's attitude towards wife-beatings, for instance, is negatively related to the household's wealth index, which means that women who believe wife beatings are never justified are more often associated with higher wealth groupings. This relationship is constant across all four countries. However, a negative attitude towards wife-beating has no directional consistency when it comes to the other three economic achievement indicators. Depending on the country, female asset ownership, employment and type of earnings can be both negatively and positively correlated to attitudes towards wife-beatings. This inconsistency of agency emphasises the contextuality of agency and empowerment. A possible explanation for these results may be the lack of adequate WEE indicators. Previous studies evaluating measurements of agency and empowerment observed inconsistent results on whether the DHS can adequately account for WEE. The research by Hanmer and Klugman (2016), which was used as the baseline for this stage, questioned the usability of the DHS and suggested additional questionnaire items. My study confirms their struggle to find consistent patterns in the dynamics between economic achievement and agency. This may also imply that the theoretical framework provided by Kabeer (1999) and extended by Buvinic et al. (2020) is not suitable to be applied in all contexts, meaning that WEE might be defined in the same manner in SSA as previously assumed.

Another surprising finding is that polygyny is positively related to asset ownership across all four countries. Whereas this might be counterintuitive, it can be argued that richer men are more likely to have multiple wives, which overall increases the chances of them owning physical assets such as land and homes, which is in accordance with studies done by Dalton and Leung (2014). Based on

the results, one can conclude that wealth and economic achievement does not prevent agency deprivation, which is similar to conclusions drawn by Hanmer and Klugman (2016).

The three analytical stages emphasised the contextually of WEE and its complex mechanisms. This thesis attempted to show that prioritising female empowerment and gender equality is not just necessary in its own right, but also positively impacts the “wealth and well-being of nations” (Blumberg, 2005, p.1). Moreover, this thesis aimed to explore how resources such as financial services can impact female economic empowerment. The multiple regression analyses revealed that the relationships between WEE, financial inclusion and economic development are not as clearly defined as previously assumed. The top-down approach showed that studying WEE on an aggregated level results does derive strong results, confirming the stance that to gain meaningful insights, empowerment should only be studied on an individual level. On the micro-level, financial inclusion and economic achievement have a strong positive association, which can be regarded as the main results.

7. Conclusion

This thesis aimed to explore, conceptually and empirically, the relationship between financial inclusion, economic development and the synthesis between the process and outcome of female economic empowerment in sub-Saharan African countries. Based on the various econometric analyses, I can draw five main conclusions about the aforementioned relationships.

First, my research has shown that WEE and national income have a weaker association than expected. Only through female health and female full-time workers can WEE affect national income per capita. However, it has become evident that WEE, given its contextuality, may be limited to micro-data analysis. Reliable data and methodological limitations are key issues in doing research on WEE in SSA. As pointed out throughout the thesis, data sources to estimate WEE can be derived from multiple sources. However, there is no consistency in the reliable measurement of agency or economic achievement in cross-country analyses. Considerably more research and data collection will need to be done to accurately estimate WEE in SSA.

Second, on an aggregated cross-country level in SSA, I was unable to declare financial inclusion a strong predictor of economic achievement. Nonetheless, my results provided useful insights given that the legal environment and measurements of agency deemed strong estimators of economic achievement. Laws governing equal wages and entrepreneurial opportunities as well as anti-workplace discrimination are essential for women to thrive in the economy. This underlines the facts that even though one can study WEE separately, its effects have to be considered in a broader spectrum including the legal, political and social spheres.

Third, in Cameroon, Guinea, Benin and Nigeria, given the individual level DHS data, financial inclusion fosters female economic empowerment. Women who either have an account at a financial institution or use mobile money are more likely to be employed, own assets, belong to higher wealth groupings and are more likely to be paid in cash. On an individual level, these findings imply that account ownership provides a crucial resource for women in order to independently seize market opportunities. This information can be used to develop targeted interventions aimed at broadening the scope of female financial inclusion in those four countries.

Fourth, the micro-level analysis yielded important insight into the nexus between resources, agency and economic achievement. Efforts made to increase a woman's economic achievement should therefore focus on the dual-approach of increasing formal financial account ownership as well as the ability to exercise her agency. The "vicious cycle" between financial inclusion and agency is hindering women's empowerment and may only be avoided when considering the influence of agency and resources together. Policy interventions, therefore, have to account for the dual-relationship between agency and financial inclusion, by which targeting only one dimension may not suffice in facilitating female economic achievement.

Fifth and last, looking at the three stages holistically, my findings highlight the contextuality of WEE. Given the weak or insignificant results on the aggregated, cross-country level in Stage 1 and 2, the relationships between resources, agency and economic achievements may not be suitable to be measured and studied in a cross-country setting, even when the countries are located in the same region such as SSA. This also holds true for Stage 3, where the nexus between agency and achievement were not consistent across Cameroon, Guinea, Benin and Nigeria. From a theoretical perspective, one might argue that Buvinic et al.'s (2020) framework is not applicable in all environments. Practically, this means that policy interventions, aiming to foster the economic empowerment of a woman, should target the country-specific, individual-level samples in order to be effective. Future research should focus on these limitations and collect more reliable WEE data. This is also true for the DHS Program, where better indicators for economic achievements, such as female income and gender wage gap may be needed.

8. References

Aga, G. A. & Peria, M. S. M. (2014). International Remittances and Financial Inclusion in Sub-Saharan Africa, The World Bank.

Amartya, S. (2003). Missing Women—Revisited, *BMJ*, vol. 327, no. 7427, pp. 1297–1298.

Annan, F. (2019). Gender and Financial Misconduct: A Field Experiment on Mobile Money, SSRN Scholarly Paper, ID 3534762, Rochester, NY: Social Science Research Network, Available Online: <https://papers.ssrn.com/abstract=3534762> [Accessed 30 December 2020].

Asaolu, I. O., Alaofè, H., Gunn, J. K., Adu, A. K., Monroy, A. J., Ehiri, J. E., Hayden, M. H. & Ernst, K. C. (2018). Measuring Women’s Empowerment in Sub-Saharan Africa: Exploratory and Confirmatory Factor Analyses of the Demographic and Health Surveys, *Frontiers in psychology*, vol. 9, p. 994.

Ballon, P. (2018). A Structural Equation Model of Female Empowerment, *The Journal of Development Studies*, vol. 54, no. 8, pp. 1303–1320.

Bandiera, O., Buehren, N., Burgess, R., Goldstein, M., Gulesci, S., Rasul, I. & Sulaiman, M. (2020). Women’s Empowerment in Action: Evidence from a Randomized Control Trial in Africa, *American Economic Journal: Applied Economics*, vol. 12, no. 1, pp. 210–259.

Bhatia, S. & Singh, S. (2019). Empowering Women Through Financial Inclusion: A Study of Urban Slum, *Vikalpa*, vol. 44, no. 4, pp. 182–197.

Bloom, D. E., Kuhn, M. & Prettnner, K. (2020). The Contribution of Female Health to Economic Development, *The Economic Journal*, vol. 130, no. 630, pp. 1650–1677.

Blumberg, R. L. (2005.). Women’s Economic Empowerment as the “Magic Potion ” of Development, In 100th Annual Meeting of the American Sociological Association, August, Philadelphia.

Buku, M. W. & Meredith, M. W. (2012). Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity Mobile Money Symposium 2013, *Washington Journal of Law, Technology & Arts*, vol. 8, no. 3, pp. 375–400.

Buvinić, M. & Furst-Nichols, R. (2016). Promoting Women's Economic Empowerment: What Works?, *The World Bank Research Observer*, vol. 31, no. 1, pp. 59–101.

Buvinic, M., O'Donnell, M., Knowles, J. C. & Bourgault, S. (2020). Measuring Women's Economic Empowerment: A Compendium of Selected Tools, p.120. *ExxonMobil Foundation*

Charmes, J. (2019). The Unpaid Care Work and the Labour Market. An Analysis of Time Use Data Based on the Latest World Compilation of Time-Use Surveys, *Geneva: ILO*.

Charmes, J. & Wieringa, S. (2003). Measuring Women's Empowerment: An Assessment of the Gender-Related Development Index and the Gender Empowerment Measure, *Journal of Human Development*, vol. 4, no. 3, pp. 419–435.

Chew, H. E., Ilavarasan, V. P. & Levy, M. R. (2015). Mattering Matters: Agency, Empowerment, and Mobile Phone Use by Female Microentrepreneurs, *Information Technology for Development*, vol. 21, no. 4, pp. 523–542.

Demirgüç-Kunt, A., Klapper, L. & Singer, D. (2013). Financial Inclusion and Legal Discrimination against Women: Evidence from Developing Countries, [e-book] The World Bank, Available Online: <http://elibrary.worldbank.org/doi/book/10.1596/1813-9450-6416> [Accessed 4 April 2021].

Demirgüç-Kunt, A. & Singer, D. (2013). The Global Findex Database Women and Financial Inclusion.

DHS Program - Research Topics - Wealth Index. (2021). , Available Online: <https://dhsprogram.com/topics/wealth-index/index.cfm> [Accessed 7 April 2021].

Diebolt, C. & Perrin, F. (2013). From Stagnation to Sustained Growth: The Role of Female Empowerment, *American Economic Review*, vol. 103, no. 3, pp. 545–549.

Doepke, M. & Tertilt, M. (2014). Does Female Empowerment Promote Economic Development?, w19888, National Bureau of Economic Research, Available Online: <https://www.nber.org/papers/w19888> [Accessed 2 March 2021].

Doepke, M. & Tertilt, M. (2018). Women's Empowerment, the Gender Gap in Desired Fertility, and Fertility Outcomes in Developing Countries, *AEA Papers and Proceedings*, vol. 108, pp. 358–362.

Doss, C., Kovarik, C., Peterman, A., Quisumbing, A. & Van den Bold, M. (2015). Gender Inequalities in Ownership and Control of Land in Africa: Myth and Reality, *Agricultural Economics*, vol. 46, no. 3, pp. 403–434.

Duflo, E. (2012). Women Empowerment and Economic Development, *Journal of Economic Literature*, vol. 50, no. 4, pp. 1051–1079.

Duflo, E. & Udry, C. (2004). Intrahousehold Resource Allocation in Cote d'Ivoire: Social Norms, Separate Accounts and Consumption Choices, w10498, National Bureau of Economic Research, Available Online: <https://www.nber.org/papers/w10498> [Accessed 5 January 2021].

Duncombe, R. (2012). An Evidence-Based Framework for Assessing the Potential of Mobile Finance in Sub-Saharan Africa, *The Journal of Modern African Studies*, vol. 50, no. 3, pp. 369–395.

Female Entrepreneurship Index 2015 Report | Global Entrepreneurship Development Institute. (2021). , Available Online: <https://thegedi.org/female-entrepreneurship-index-2015-report/> [Accessed 4 January 2021].

Edmonds, Eric V. (2006). "Child labor and Schooling Responses to Anticipated Income in South Africa." *Journal of Development Economics* 81 (2): pp. 386–414.

Ferrant, G. & Thim, A. (2019). Measuring Women's Economic Empowerment: Time Use Data and Gender Inequality, [e-journal], Available Online: https://www.oecd-ilibrary.org/development/measuring-women-s-economic-empowerment_02e538fc-en [Accessed 1 April 2021].

Glewwe, P., Maïga, E. & Zheng, H. (2014). The Contribution of Education to Economic Growth: A Review of the Evidence, with Special Attention and an Application to Sub-Saharan Africa, *World Development*, vol. 59, pp. 379–393.

Hanmer, L. & Klugman, J. (2016). Exploring Women’s Agency and Empowerment in Developing Countries: Where Do We Stand?, *Feminist Economics*, vol. 22, no. 1, pp. 237–263.

Heckert, J. & Fabric, M. S. (2013). Improving Data Concerning Women’s Empowerment in Sub-Saharan Africa, *Studies in Family Planning*, vol. 44, no. 3, pp. 319–344.

Hendriks, S. (2019). The Role of Financial Inclusion in Driving Women’s Economic Empowerment, *Development in Practice*, vol. 29, no. 8, pp. 1029–1038.

Holloway, K., Niazi, Z. and Rouse, R., (2017). Women’s economic empowerment through financial inclusion: A review of existing evidence and remaining knowledge gaps. *Innovations for Poverty Action*.

Hughes, N. & Lonie, S. (2007). M-PESA: Mobile Money for the “Unbanked” Turning Cellphones into 24-Hour Tellers in Kenya, *Innovations: Technology, Governance, Globalization*, vol. 2, no. 1–2, pp. 63–81.

Ibrahim, S. & Alkire, S. (2007). Agency and Empowerment: A Proposal for Internationally Comparable Indicators, *Oxford Development Studies*, vol. 35, no. 4, pp. 379–403.

ILOSTAT, 2021 Available Online: <https://ilostat.ilo.org/> [Accessed 30 April 2021].

Ivatury, G. & Mas, I. (2008). The Early Experience with Branchless Banking, SSRN Scholarly Paper, ID 1655257, Rochester, NY: Social Science Research Network, Available Online: <https://papers.ssrn.com/abstract=1655257> [Accessed 3 January 2021].

Jennings, L., Na, M., Cherewick, M., Hindin, M., Mullany, B. & Ahmed, S. (2014). Women’s Empowerment and Male Involvement in Antenatal Care: Analyses of Demographic and Health

Surveys (DHS) in Selected African Countries, *BMC pregnancy and childbirth*, vol. 14, no. 1, pp. 1–11.

Kabeer, N. (1999). Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment, *Development and Change*, vol. 30, no. 3, pp. 435–464.

Kabeer, N. (2005). Gender Equality and Women's Empowerment: A Critical Analysis of the Third Millennium Development Goal 1, *Gender & Development*, vol. 13, no. 1, pp. 13–24.

Kabeer, N. (2011). Contextualising the Economic Pathways of Women's Empowerment: Findings from a Multi-Country Research Programme, [e-journal], Available Online: <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/5842> [Accessed 31 March 2021].

Kabeer, N. (2012). Women's Economic Empowerment and Inclusive Growth: Labour Markets and Enterprise Development.

Kidder, T., Bright, D. & Green, C. (2014). Meaningful Action: Effective Approaches to Women's Economic Empowerment in Agriculture.

Kishor, S. & Subaiya, L. (2008). Understanding Women's Empowerment: A Comparative Analysis of Demographic and Health Surveys (DHS) Data, DHS Comparative Reports No. 20, [e-journal], Available Online: <https://dhsprogram.com/publications/publication-cr20-comparative-reports.cfm> [Accessed 31 March 2021].

Kitindi, E.G., (2006). Barriers to growth of urban-based small scale female entrepreneurship in Botswana. *Botswana Institute of Administration & Commerce Journal*, 3(2), pp. 1-24., Available Online: https://journals.co.za/content/biac/3/2/AJA17291070_88 [Accessed 30 December 2020].

Klasen, S. (1994). "Missing Women" Reconsidered, *World Development*, vol. 22, no. 7, pp. 1061–1071.

Klasen, S. (2002). Low Schooling for Girls, Slower Growth for All? Cross-Country Evidence on the Effect of Gender Inequality in Education on Economic Development, *The World Bank Economic Review*, vol. 16, no. 3, pp. 345–373.

Laszlo, S., Grantham, K., Oskay, E. & Zhang, T. (2020). Grappling with the Challenges of Measuring Women's Economic Empowerment in Intrahousehold Settings, *World Development*, vol. 132, p. 104.

Malhotra, A., Schuler, S. R. & Boender, C. (2002). Measuring Women's Empowerment as a Variable in International Development, p. 59.

Maru, L. & Razia, C. (2013). Microfinance Interventions and Empowerment of Women Entrepreneurs Rural Constituencies in Kenya, *Review of Quantitative Finance and Accounting*, vol. 4, pp. 84–95.

Mehra, R. (1997). Women, Empowerment, and Economic Development, *The ANNALS of the American Academy of Political and Social Science*, vol. 554, no. 1, pp. 136–149.

Mendolia, S., Nguyen, N. & Yerokhin, O. (2019). The Impact of Parental Illness on Children's Schooling and Labour Force Participation: Evidence from Vietnam, *Review of Economics of the Household*, vol. 17, no. 2, pp. 469–492.

Miedema, S. S., Haardörfer, R., Girard, A. W. & Yount, K. M. (2018). Women's Empowerment in East Africa: Development of a Cross-Country Comparable Measure, *World Development*, vol. 110, pp. 453–464.

Mohammed, J. I., Mensah, Lord & Gyeke-Dako, A. (2017). Financial Inclusion and Poverty Reduction in Sub-Saharan Africa, *African Finance Journal*, vol. 19, no. 1, pp. 1–22.

Molyneux, M. & Thomson, M. (2011). Cash Transfers, Gender Equity and Women's Empowerment in Peru, Ecuador and Bolivia, *Gender & Development*, vol. 19, no. 2, pp. 195–212.

Mundial, B., (2012). The effect of women's economic power in Latin America and the Caribbean. *World Bank*.

OECD (2019), Gender, Institutions and Development Database., Available Online: <https://www.genderindex.org/ranking/> [Accessed 6 March 2021].

van Oudheusden, P., Klapper, L., Demirguc-Kunt, A. and Singer, D., (2015). The global finindex database 2014: measuring financial inclusion around the world. *World Bank, Washington, DC*. Available Online: <https://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-7255> [Accessed 5 January 2021].

Peruta, M. D. (2018). Adoption of Mobile Money and Financial Inclusion: A Macroeconomic Approach through Cluster Analysis, *Economics of Innovation and New Technology*, vol. 27, no. 2, pp. 154–173.

Peterson, J. (1987). The Feminization of Poverty, *Journal of Economic Issues*, vol. 21, no. 1, pp. 329–337.

Rettig, E. M., Fick, S. E. & Hijmans, R. J. (2020). The Female Empowerment Index (FEMI): Spatial and Temporal Variation in Women's Empowerment in Nigeria, *Heliyon*, vol. 6, no. 5.

Samman, E. & Santos, M. E. (2009). Agency and Empowerment: A Review of Concepts, Indicators and Empirical Evidence.

Sen, A. (1985). Well-Being, Agency and Freedom: The Dewey Lectures 1984, *The journal of philosophy*, vol. 82, no. 4, pp. 169–221.

Sen, A. (1999). Commodities and Capabilities, *OUP Catalogue*, [e-book] Oxford University Press, Available Online: <https://ideas.repec.org/b/oxp/obooks/9780195650389.html> [Accessed 6 May 2021].

Schatz, E. & Williams, J. (2012). Measuring Gender and Reproductive Health in Africa Using Demographic and Health Surveys: The Need for Mixed-Methods Research, *Culture, health & sexuality*, vol. 14, no. 7, pp. 811–826.

Siddik, M. N. A. (2017). Does Financial Inclusion Promote Women Empowerment? Evidence from Bangladesh, *Applied Economics and Finance*, vol. 4, no. 4, pp. 169–177.

Svensson, N., (2012). The Role of Women in Promoting Peace and Development: Proceedings of the 10th Annual Conference on the Horn of Africa, Lund, Sweden, September 23 - 24 2011, Lund: Media-Tryck, Lund University.

UN. (2017). Goal 5, Department of Economic and Social Affairs. , Available Online: <https://sdgs.un.org/goals/goal5> [Accessed 23 May 2021].

UN Development Program. (2021). UNDP in Sub-Saharan Africa: Supporting a Region on the Move. *UNDP*, Available Online: <https://www.africa.undp.org/content/rba/en/home/library/outreach-material/undp-africa-brochure.html>

UN Population Fund (2000). State of World Population 2000, Available Online: <https://www.un-ilibrary.org/content/books/9789210604482c001> [Accessed 24 May 2021].

UN Women. (2021). Intersectional Feminism: What It Means and Why It Matters Right Now, *UN Women*, Available Online: <https://www.unwomen.org/en/news/stories/2020/6/explainer-intersectional-feminism-what-it-means-and-why-it-matters> [Accessed 7 May 2021].

Upadhyay, U. D. & Karasek, D. (2012). Women’s Empowerment and Ideal Family Size: An Examination of DHS Empowerment Measures in Sub-Saharan Africa, *International perspectives on sexual and reproductive health*, pp. 78–89.

World Bank. (2018). Global Findex Database 2017. Available Online: https://globalfindex.worldbank.org/#data_sec_focus [Accessed 27 April 2021].

World Bank. (2021). World Development Indicators. Available Online: <http://data.worldbank.org/indicator> [Accessed 17 April 2021].

World Bank. (2021b). Women, Business and the Law Data. Available Online: <https://wbl.worldbank.org/en/wbl-data> [Accessed 23 May 2021].

World Bank Group. (2021a). Enterprise Surveys Program. (<http://www.enterprisesurveys.org>) [Accessed 3 April 2021].

World Bank Group. (2021b). Survey Methodology for Enterprise Surveys - *World Bank*, Available Online: <https://www.enterprisesurveys.org/en/methodology> [Accessed 12 May 2021].

Zhang, J., Zhang, J. & Li, T. (1999). Gender Bias and Economic Development in an Endogenous Growth Model, p. 29.

Zins, A. & Weill, L. (2016). The Determinants of Financial Inclusion in Africa, *Review of Development Finance*, vol. 6, no. 1, pp. 46–57.

9. Appendix

Appendix A: Descriptive Statistic & Variable Construction

Table I: Descriptive Statistics Stage 1

| Descriptive Statistics | | | | | |
|--|-----|--------|-----------|--------|---------|
| Variable | Obs | Mean | Std. Dev. | Min | Max |
| Log of GDP per capita in 2017 | 30 | 6.937 | .716 | 5.877 | 8.886 |
| Female Business Ownership | 30 | 29.103 | 11.558 | 9 | 53.3 |
| Female Business Manager | 30 | 15.72 | 7.08 | 4.5 | 36.2 |
| Female Fulltime Workers | 30 | 26.713 | 8.665 | 12.9 | 48.2 |
| Physical Integrity | 30 | .588 | .206 | .308 | 1 |
| Restricted resources and assets | 30 | .587 | .186 | .205 | 1 |
| Restricted civil liberties | 30 | .496 | .258 | 0 | .814 |
| Discriminatory family | 30 | .519 | .196 | .171 | 1 |
| Son Bias | 30 | .163 | .118 | 0 | .44 |
| Female Life Expectancy | 30 | 62.653 | 4.505 | 54.354 | 70.398 |
| Female employment | 30 | 42.382 | 16.726 | 9.03 | 70.79 |
| Female-to-male Labour Force Participation Rate in 2017 | 30 | 85.439 | 11.684 | 44.121 | 103.112 |
| Rural-to-urban Ratio in 2017 | 30 | 60.313 | 15.998 | 11.024 | 83.65 |
| Polygyny | 30 | 12.1 | 7.83 | 1.4 | 28 |

Table II: Descriptive Statistics Stage 2

| Descriptive Statistics | | | | | |
|--|-----|--------|-----------|--------|---------|
| Variable | Obs | Mean | Std. Dev. | Min | Max |
| Female Business Ownership | 30 | 29.17 | 11.707 | 9 | 55.3 |
| Female Business Manager | 30 | 15.867 | 7.048 | 4.5 | 36.2 |
| Female Fulltime Workers | 30 | 27.223 | 9.056 | 12.9 | 48.2 |
| Physical Integrity | 30 | .578 | .212 | .306 | 1 |
| Discriminatory family | 30 | .514 | .197 | .171 | 1 |
| Restricted civil liberties | 30 | .496 | .258 | 0 | .814 |
| Son bias | 30 | .169 | .115 | 0 | .44 |
| Mobile Money Account | 30 | .217 | .157 | .001 | .694 |
| Financial Institution Account | 30 | .239 | .146 | .051 | .776 |
| Formal borrowing | 30 | .058 | .03 | .01 | .134 |
| Female-to-male Labour Force Participation Rate | 30 | 85.58 | 11.644 | 44.121 | 103.112 |
| Employment | 30 | 41.528 | 17.001 | 9.03 | 70.79 |
| Legal differences in entrepreneurship | 30 | 74.167 | 13.901 | 50 | 100 |
| Legal differences in pay | 30 | 60 | 29.066 | 25 | 100 |
| Legal differences in the workplace | 30 | 81.667 | 27.803 | 25 | 100 |

Table III: Cross-Country Summary Stage 1 & 2

| Country Name | GDP per capita in 2017 (current USD) | Female Employment in % | Women Business and Law Index | Human Development Index Value |
|---|--------------------------------------|------------------------|------------------------------|-------------------------------|
| Benin | 1136.59 | 43.56 | 74.37 | .854 |
| Burkina Faso | 734.99 | 40.49 | 76.87 | .866 |
| Botswana (only included in Stage 2) | 7893.23 | | 63.75 | |
| Central African Republic (only included in Stage 1) | 450.90 | 49.52 | | .801 |
| Cte d'Ivoire | 2111.02 | 24.77 | 78.12 | .811 |
| Cameroon | 1425.10 | 48.72 | 60.00 | .864 |
| Democratic Republic of the Congo | 467.07 | 36.56 | 70.00 | .845 |
| Congo | 2191.22 | 34.29 | 49.37 | .928 |
| Ethiopia | 768.52 | 64.96 | 71.87 | .837 |
| Gabon | 7230.39 | 9.03 | 57.50 | .915 |
| Ghana | 2025.93 | 35.61 | 75.00 | .910 |
| Guinea | 855.57 | 46.75 | 65.00 | |
| Kenya | 1572.33 | 39.27 | 80.62 | .936 |
| Liberia | 698.70 | 53.05 | 81.25 | .889 |
| Lesotho | 1150.07 | 21.39 | 78.12 | 1.013 |
| Madagascar | 515.29 | 70.79 | 71.87 | .952 |
| Mali | 830.01 | 43.16 | 54.37 | .820 |
| Mozambique | 461.41 | 58.36 | 79.37 | .912 |
| Mauritania | 1578.11 | 10.43 | 48.12 | .863 |
| Malawi | 356.71 | 56.03 | 77.50 | .986 |
| Namibia | 5303.30 | 16.29 | 86.25 | |
| Niger | 517.97 | 50.59 | 56.25 | .723 |
| Nigeria | 1968.56 | 23.00 | 63.12 | .881 |
| Rwanda | 772.31 | 62.63 | 78.12 | .945 |
| Sierra Leone | 499.38 | 31.75 | 63.12 | .883 |
| Chad | 665.94 | 54.51 | 66.25 | .764 |
| Togo | 626.09 | 26.22 | 84.37 | .821 |
| Tanzania | 1004.84 | 66.64 | 81.25 | .947 |
| Uganda | 747.19 | 48.86 | 70.00 | .863 |
| Zambia | 1534.86 | 41.83 | 78.75 | .958 |
| Zimbabwe | 1548.17 | 62.38 | 86.87 | .931 |

Table IV: Descriptive Statistics Stage 3

A) for Guinea

| Stage 3: Descriptive Statistics (Guinea) | | | | | |
|---|-------|--------|-----------|-----|-----|
| Variable | Obs | Mean | Std. Dev. | Min | Max |
| Wealth Index | 10874 | 3.05 | 1.432 | 1 | 5 |
| Asset Ownership | 10874 | .499 | .783 | 0 | 3 |
| Employed | 10874 | .651 | .477 | 0 | 1 |
| Type of Earnings | 7641 | 1.515 | 1.446 | 0 | 3 |
| Financial Institution Account | 10874 | .036 | .186 | 0 | 1 |
| Uses Mobile Money | 7552 | .167 | .373 | 0 | 1 |
| Control: Healthcare | 7750 | 1.497 | .684 | 1 | 3 |
| Control: Household spending | 7743 | 1.652 | .754 | 1 | 3 |
| Control: Family visits | 7812 | 2.127 | 1.145 | 1 | 4 |
| Control: Husband's earnings | 7716 | 1.381 | .667 | 1 | 3 |
| Attitude towards beating | 10874 | .708 | .455 | 0 | 1 |
| Can she refuse sex? | 6853 | .451 | .498 | 0 | 1 |
| Can she ask for condom? | 6734 | .26 | .438 | 0 | 1 |
| Age at first intercourse | 10874 | 13.571 | 6.579 | 0 | 37 |
| Highest Education achieved | 10874 | .531 | .874 | 0 | 3 |
| Marital Status | 10874 | .88 | .746 | 0 | 5 |
| Sex of household head? | . | . | . | . | . |
| Male | 10874 | .829 | .376 | 0 | 1 |
| Female | 10874 | .171 | .376 | 0 | 1 |
| Polygamy? | . | . | . | . | . |
| No | 7757 | .561 | .496 | 0 | 1 |
| Yes | 7757 | .439 | .496 | 0 | 1 |
| Region? | . | . | . | . | . |
| Urban | 10874 | .372 | .483 | 0 | 1 |
| Rural | 10874 | .628 | .483 | 0 | 1 |
| Religion | 10874 | 1.133 | .417 | 1 | 4 |
| Age | 5455 | 28.52 | 9.844 | 15 | 49 |

B) for Nigeria

| Stage 3: Descriptive Statistics (Nigeria) | | | | | |
|--|-------|--------|-----------|-----|-----|
| Variable | Obs | Mean | Std. Dev. | Min | Max |
| Wealth Index | 22388 | 3.665 | 1.202 | 1 | 5 |
| Asset Ownership | 22388 | .253 | .596 | 0 | 3 |
| Employed | 22388 | .728 | .445 | 0 | 1 |
| Type of Earnings | 16971 | 2.453 | 1.065 | 0 | 3 |
| Financial Institution Account | 22388 | .367 | .482 | 0 | 1 |
| Uses Mobile Money | 22388 | .253 | .435 | 0 | 1 |
| Control: Healthcare | 15087 | 1.701 | .69 | 1 | 3 |
| Control: Household spending | 15071 | 1.608 | .633 | 1 | 3 |
| Control: Family visits | 15113 | 2.531 | 1.091 | 1 | 4 |
| Control: Husband's earnings | 14995 | 1.421 | .61 | 1 | 3 |
| Attitude towards beating | 22388 | .204 | .403 | 0 | 1 |
| Can she refuse sex? | 14642 | .707 | .455 | 0 | 1 |
| Can she ask for condom? | 14434 | .566 | .496 | 0 | 1 |
| Age at first intercourse | 22388 | 15.589 | 6.643 | 0 | 45 |
| Highest Education achieved | 22388 | 1.716 | .947 | 0 | 3 |
| Marital Status | 22388 | .974 | .946 | 0 | 5 |
| Sex of household head? | . | . | . | . | . |
| Male | 22388 | .775 | .418 | 0 | 1 |
| Female | 22388 | .225 | .418 | 0 | 1 |
| Polygamy? | . | . | . | . | . |
| No | 15028 | .787 | .409 | 0 | 1 |
| Yes | 15028 | .213 | .409 | 0 | 1 |
| Region? | . | . | . | . | . |
| Urban | 22388 | .551 | .497 | 0 | 1 |
| Rural | 22388 | .449 | .497 | 0 | 1 |
| Religion | 22388 | 2.695 | 6.44 | 1 | 96 |
| Age | 8352 | 30.59 | 8.919 | 15 | 49 |

C) for Cameroon

| Stage 3: Descriptive Statistics (Cameroon) | | | | | |
|---|-------|--------|-----------|-----|-----|
| Variable | Obs | Mean | Std. Dev. | Min | Max |
| Wealth Index | 14675 | 3.177 | 1.337 | 1 | 5 |
| Asset Ownership | 14675 | .255 | .61 | 0 | 3 |
| Employed | 14675 | .62 | .485 | 0 | 1 |
| Type of Earnings | 9682 | 2.008 | 1.148 | 0 | 3 |
| Financial Institution Account | 14675 | .097 | .296 | 0 | 1 |
| Uses Mobile Money | 9395 | .466 | .499 | 0 | 1 |
| Control: Healthcare | 8021 | 1.689 | .652 | 1 | 3 |
| Control: Household spending | 8004 | 1.745 | .661 | 1 | 3 |
| Control: Family visits | 8059 | 2.476 | 1.083 | 1 | 4 |
| Control: Husband's earnings | 7891 | 1.533 | .612 | 1 | 3 |
| Attitude towards beating | 14675 | .286 | .452 | 0 | 1 |
| Can she refuse sex? | 7708 | .708 | .455 | 0 | 1 |
| Can she ask for condom? | 7593 | .571 | .495 | 0 | 1 |
| Age at first intercourse | 14675 | 14.155 | 6.207 | 0 | 49 |
| Highest Education achieved | 14675 | 1.398 | .867 | 0 | 3 |
| Marital Status | 14675 | 1.146 | 1.254 | 0 | 5 |
| Sex of household head? | . | . | . | . | . |
| Male | 14675 | .705 | .456 | 0 | 1 |
| Female | 14675 | .295 | .456 | 0 | 1 |
| Polygamy? | . | . | . | . | . |
| No | 7803 | .783 | .412 | 0 | 1 |
| Yes | 7803 | .217 | .412 | 0 | 1 |
| Region? | . | . | . | . | . |
| Urban | 14675 | .534 | .499 | 0 | 1 |
| Rural | 14675 | .466 | .499 | 0 | 1 |
| Religion | 14675 | 2.757 | 6.861 | 1 | 96 |
| Age | 13525 | 27.807 | 9.444 | 15 | 49 |

D) for Benin

| Stage 3: Descriptive Statistics (Benin) | | | | | |
|--|-------|--------|-----------|-----|-----|
| Variable | Obs | Mean | Std. Dev. | Min | Max |
| Wealth Index | 15928 | 3.141 | 1.432 | 1 | 5 |
| Asset Ownership | 15928 | .255 | .592 | 0 | 3 |
| Employed | 15928 | .755 | .43 | 0 | 1 |
| Type of Earnings | 12403 | 2.21 | 1.207 | 0 | 3 |
| Financial Institution Account | 15928 | .068 | .252 | 0 | 1 |
| Uses Mobile Money | 8105 | .279 | .448 | 0 | 1 |
| Control: Healthcare | 11102 | 1.586 | .69 | 1 | 3 |
| Control: Household spending | 11080 | 1.568 | .652 | 1 | 3 |
| Control: Family visits | 11170 | 2.549 | 1.153 | 1 | 4 |
| Control: Husband's earnings | 10994 | 1.333 | .594 | 1 | 3 |
| Attitude towards beating | 15928 | .324 | .468 | 0 | 1 |
| Can she refuse sex? | 5218 | .589 | .492 | 0 | 1 |
| Can she ask for condom? | 5102 | .422 | .494 | 0 | 1 |
| Age at first intercourse | 15928 | 14.654 | 6.002 | 0 | 36 |
| Highest Education achieved | 15928 | .727 | .894 | 0 | 3 |
| Marital Status | 15928 | 1.068 | .97 | 0 | 5 |
| Sex of household head? | . | . | . | . | . |
| Male | 15928 | .769 | .422 | 0 | 1 |
| Female | 15928 | .231 | .422 | 0 | 1 |
| Polygamy? | . | . | . | . | . |
| No | 11056 | .618 | .486 | 0 | 1 |
| Yes | 11056 | .382 | .486 | 0 | 1 |
| Region? | . | . | . | . | . |
| Urban | 15928 | .442 | .497 | 0 | 1 |
| Rural | 15928 | .558 | .497 | 0 | 1 |
| Religion | 15928 | 4.717 | 2.414 | 1 | 10 |
| Age | 8216 | 28.63 | 9.567 | 15 | 49 |

Table V: Variable Construction Stage 3

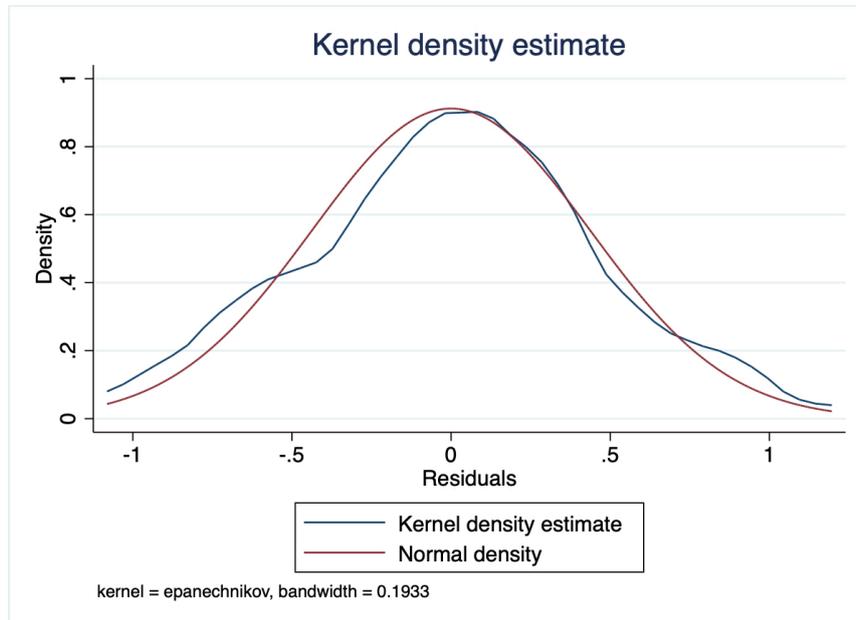
| Name | Definition | Data Type | Coding | Notes | | | | | | | | | | | | | | | | |
|-------------------------------|--|-----------------|--|--------------|-------------------|---|------------------------|----|--------------------------------|---|--------------------------------|----------|------------------|----------|------------------------|----------|--|---|------------|--|
| Average Asset ownership | Respondent owns a house or land alone or jointly | numeric (float) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>0</td> <td>does not own</td> </tr> <tr> <td>.5</td> <td></td> </tr> <tr> <td>1</td> <td>jointly only</td> </tr> <tr> <td>1.5</td> <td></td> </tr> <tr> <td>2</td> <td>both alone and jointly</td> </tr> <tr> <td>2.4</td> <td></td> </tr> <tr> <td>3</td> <td>alone only</td> </tr> </table> | Value | Definition | 0 | does not own | .5 | | 1 | jointly only | 1.5 | | 2 | both alone and jointly | 2.4 | | 3 | alone only | Recorded average value of "Owns House" and "Owns Land" |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 0 | does not own | | | | | | | | | | | | | | | | | | | |
| .5 | | | | | | | | | | | | | | | | | | | | |
| 1 | jointly only | | | | | | | | | | | | | | | | | | | |
| 1.5 | | | | | | | | | | | | | | | | | | | | |
| 2 | both alone and jointly | | | | | | | | | | | | | | | | | | | |
| 2.4 | | | | | | | | | | | | | | | | | | | | |
| 3 | alone only | | | | | | | | | | | | | | | | | | | |
| Wealth Index | | numeric (byte) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>1</td> <td>Poorest</td> </tr> <tr> <td>2</td> <td>Poorer</td> </tr> <tr> <td>3</td> <td>Middle</td> </tr> <tr> <td>4</td> <td>Richer</td> </tr> <tr> <td>5</td> <td>Richest</td> </tr> </table> | Value | Definition | 1 | Poorest | 2 | Poorer | 3 | Middle | 4 | Richer | 5 | Richest | | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 1 | Poorest | | | | | | | | | | | | | | | | | | | |
| 2 | Poorer | | | | | | | | | | | | | | | | | | | |
| 3 | Middle | | | | | | | | | | | | | | | | | | | |
| 4 | Richer | | | | | | | | | | | | | | | | | | | |
| 5 | Richest | | | | | | | | | | | | | | | | | | | |
| Type of Earnings | Type of earnings from respondent's work | numeric (float) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>0</td> <td>Not Paid</td> </tr> <tr> <td>1</td> <td>In-kind only</td> </tr> <tr> <td>2</td> <td>Cash and in-kind</td> </tr> <tr> <td>3</td> <td>Cash only</td> </tr> <tr> <td>.</td> <td>N/A</td> </tr> </table> | Value | Definition | 0 | Not Paid | 1 | In-kind only | 2 | Cash and in-kind | 3 | Cash only | . | N/A | Recorded | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 0 | Not Paid | | | | | | | | | | | | | | | | | | | |
| 1 | In-kind only | | | | | | | | | | | | | | | | | | | |
| 2 | Cash and in-kind | | | | | | | | | | | | | | | | | | | |
| 3 | Cash only | | | | | | | | | | | | | | | | | | | |
| . | N/A | | | | | | | | | | | | | | | | | | | |
| Employed | Respondent is currently working | numeric (byte) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>0</td> <td>No</td> </tr> <tr> <td>1</td> <td>Yes</td> </tr> </table> | Value | Definition | 0 | No | 1 | Yes | | | | | | | | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 0 | No | | | | | | | | | | | | | | | | | | | |
| 1 | Yes | | | | | | | | | | | | | | | | | | | |
| Mobile Money | Respondent uses mobile telephone for financial transactions | numeric (byte) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>0</td> <td>No</td> </tr> <tr> <td>1</td> <td>Yes</td> </tr> </table> | Value | Definition | 0 | No | 1 | Yes | | | | | | | | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 0 | No | | | | | | | | | | | | | | | | | | | |
| 1 | Yes | | | | | | | | | | | | | | | | | | | |
| FI Account | Respondent has an account in a bank or other financial institution | numeric (byte) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>0</td> <td>No</td> </tr> <tr> <td>1</td> <td>Yes</td> </tr> </table> | Value | Definition | 0 | No | 1 | Yes | | | | | | | | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 0 | No | | | | | | | | | | | | | | | | | | | |
| 1 | Yes | | | | | | | | | | | | | | | | | | | |
| Control: Healthcare | Who usually decides on respondent's health | numeric (byte) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>1</td> <td>Husband/ partner alone</td> </tr> <tr> <td>2</td> <td>Respondent and husband/partner</td> </tr> <tr> <td>3</td> <td>respondent alone</td> </tr> </table> | Value | Definition | 1 | Husband/ partner alone | 2 | Respondent and husband/partner | 3 | respondent alone | Recorded | | | | | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 1 | Husband/ partner alone | | | | | | | | | | | | | | | | | | | |
| 2 | Respondent and husband/partner | | | | | | | | | | | | | | | | | | | |
| 3 | respondent alone | | | | | | | | | | | | | | | | | | | |
| Control: Household Spending | Person who usually decides on large household purchases | numeric (byte) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>1</td> <td>Husband/ partner alone</td> </tr> <tr> <td>2</td> <td>Respondent and husband/partner</td> </tr> <tr> <td>3</td> <td>respondent alone</td> </tr> </table> | Value | Definition | 1 | Husband/ partner alone | 2 | Respondent and husband/partner | 3 | respondent alone | Recorded | | | | | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 1 | Husband/ partner alone | | | | | | | | | | | | | | | | | | | |
| 2 | Respondent and husband/partner | | | | | | | | | | | | | | | | | | | |
| 3 | respondent alone | | | | | | | | | | | | | | | | | | | |
| Control: Visits | Person who usually decides on visits to family or relatives | numeric (byte) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>1</td> <td>Husband/ partner alone</td> </tr> <tr> <td>2</td> <td>Other/ Someone else</td> </tr> <tr> <td>3</td> <td>Respondent and husband/partner</td> </tr> <tr> <td>4</td> <td>Respondent alone</td> </tr> </table> | Value | Definition | 1 | Husband/ partner alone | 2 | Other/ Someone else | 3 | Respondent and husband/partner | 4 | Respondent alone | Recorded | | | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 1 | Husband/ partner alone | | | | | | | | | | | | | | | | | | | |
| 2 | Other/ Someone else | | | | | | | | | | | | | | | | | | | |
| 3 | Respondent and husband/partner | | | | | | | | | | | | | | | | | | | |
| 4 | Respondent alone | | | | | | | | | | | | | | | | | | | |
| Control: Husband Money | Person who usually decides what to do with money husband earns | numeric (byte) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>1</td> <td>Husband/ partner alone</td> </tr> <tr> <td>2</td> <td>Respondent and husband/partner</td> </tr> <tr> <td>3</td> <td>respondent alone</td> </tr> </table> | Value | Definition | 1 | Husband/ partner alone | 2 | Respondent and husband/partner | 3 | respondent alone | Recorded | | | | | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 1 | Husband/ partner alone | | | | | | | | | | | | | | | | | | | |
| 2 | Respondent and husband/partner | | | | | | | | | | | | | | | | | | | |
| 3 | respondent alone | | | | | | | | | | | | | | | | | | | |
| Attitude towards Wife Beating | Respondent thinks wife beatings are justified | numeric (byte) | <table border="0"> <tr> <td>Value</td> <td>Definition</td> </tr> <tr> <td>0</td> <td>No</td> </tr> <tr> <td>1</td> <td>Yes</td> </tr> </table> | Value | Definition | 0 | No | 1 | Yes | Yes, if respondent said "Yes" to any of the following survey items (V744A-E): Beating justified if if wife burns the food ... if wife refuses to have sex with husband | | | | | | | | | | |
| Value | Definition | | | | | | | | | | | | | | | | | | | |
| 0 | No | | | | | | | | | | | | | | | | | | | |
| 1 | Yes | | | | | | | | | | | | | | | | | | | |

Table V: Variable Construction Stage 3 (continued)

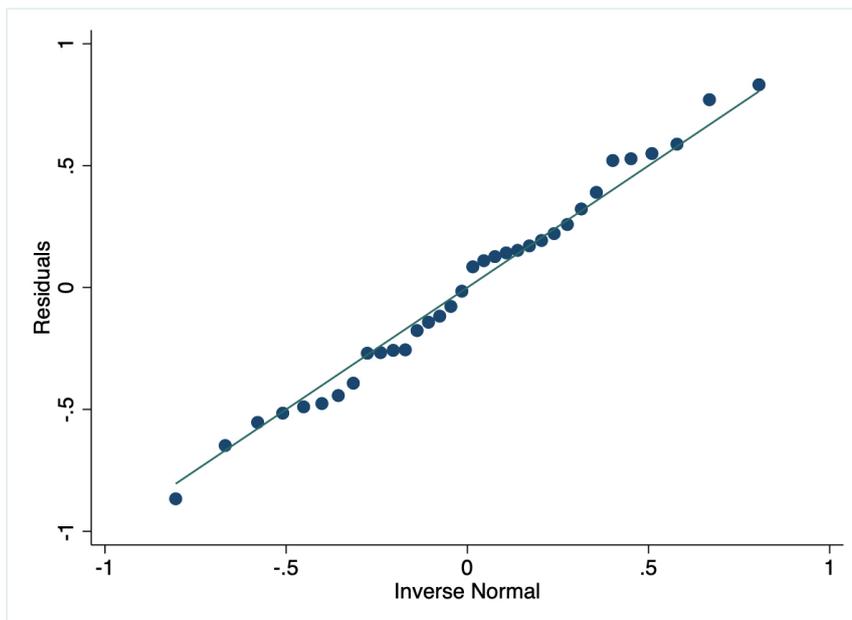
| | | | | |
|---------------------------|--|----------------|--|---|
| | | | | ... if wife argues with husband ... if wife neglects the children ... if wife goes out without telling husband |
| Refuse Sex | Respondent can refuse sex | numeric (byte) | Value 0 1 | Definition No Yes |
| Ask for Condom | Respondent can ask partner to use a condom | numeric (byte) | Value 0 1 | Definition No Yes |
| Age at first sex | Age at first sex | numeric (byte) | Value 0 8 - 49 | Definition Not had sex Age at first sex |
| Highest Educational Level | Highest educational level | numeric (byte) | Value 0 1 2 3 | Definition No Education Primary Secondary Higher |
| Marital status | Current marital status | numeric (byte) | Value 0 1 2 3 4 5 | Definition Never in union Married Living with partner Widowed Divorced No longer living together/separated |
| Sex of household head | Sex of household head | numeric (byte) | Value 1 2 | Definition Male Female |
| Polygamy | Respondent's husband has one or more wives | | Value 0 1 | Definition No other wives One or more wives |
| Region | Type of place of residence | numeric (byte) | Value 1 2 | Definition Urban Rural |
| Religion | religion | numeric (byte) | Value 1 2 3 4 5 7 96 | Definition Catholic Protestant Other Christians Muslim Animist None Other |
| Age | Women's age in years | numeric (byte) | | (from household questionnaire) |

Appendix B: Assumption Tests & Robustness Checks

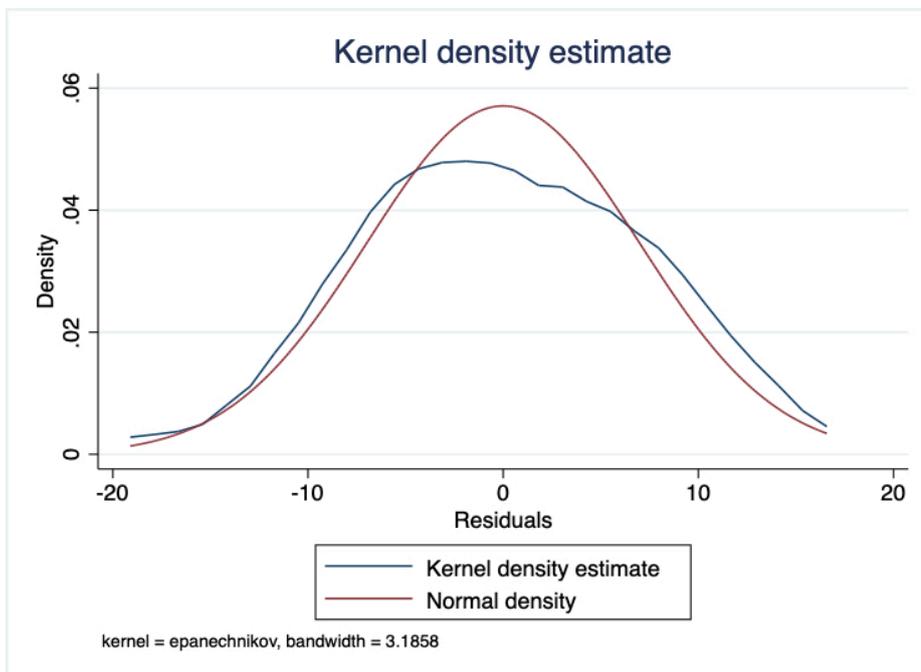
Graph 1: Stage 1: Kernel Density Estimation



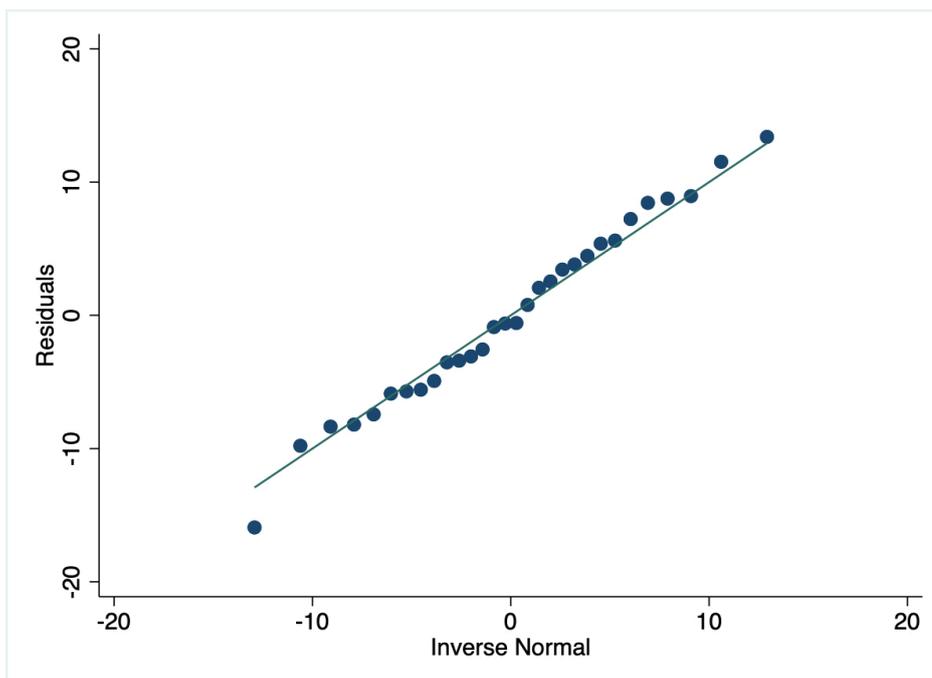
Graph 2: Stage 1: Residual's Normal Quantiles Plot



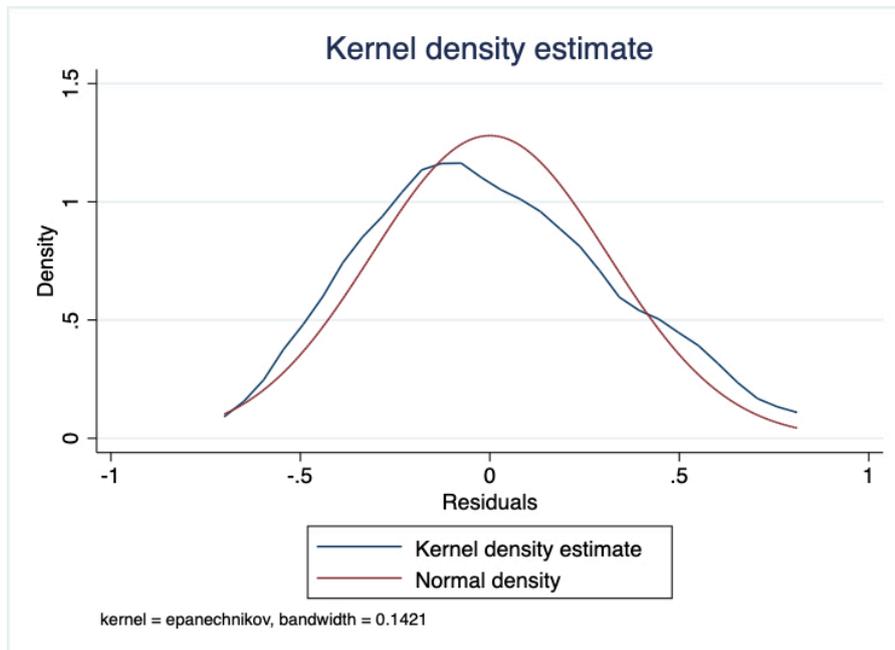
Graph 3: Stage 2: Kernel Density Estimation (Dependent Variable: Female Business Ownership)



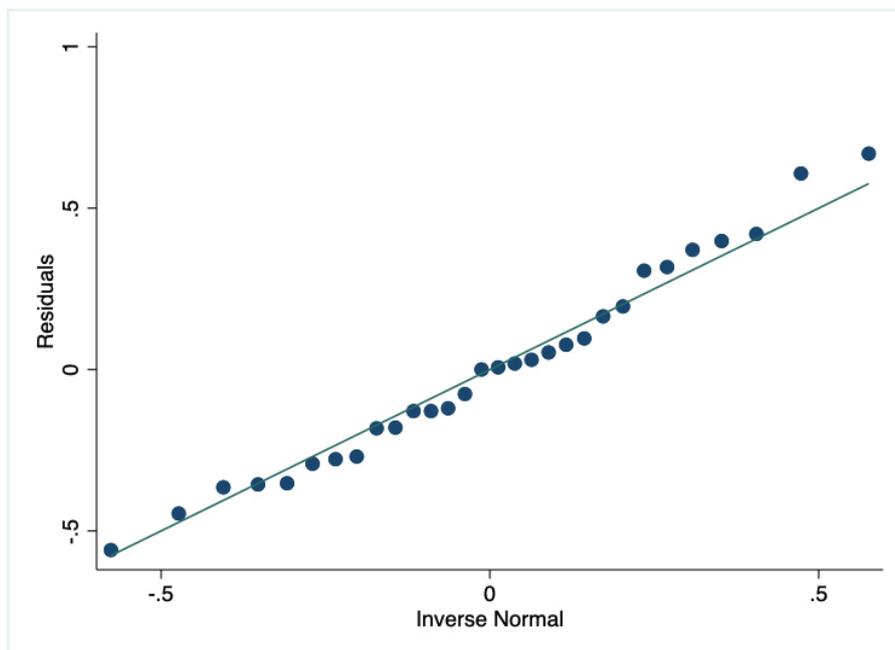
Graph 4: Stage 2: Residual's Normal Quantiles Plot (Dependent Variable: Female Business Ownership)



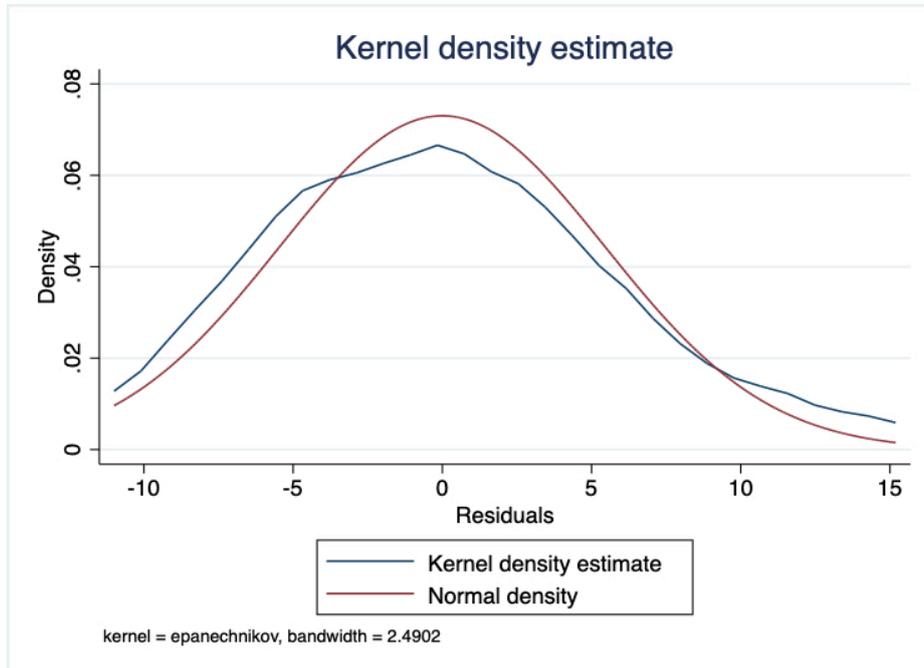
Graph 5: Stage 2: Kernel Density Estimation (Dependent Variable: Female Workers)



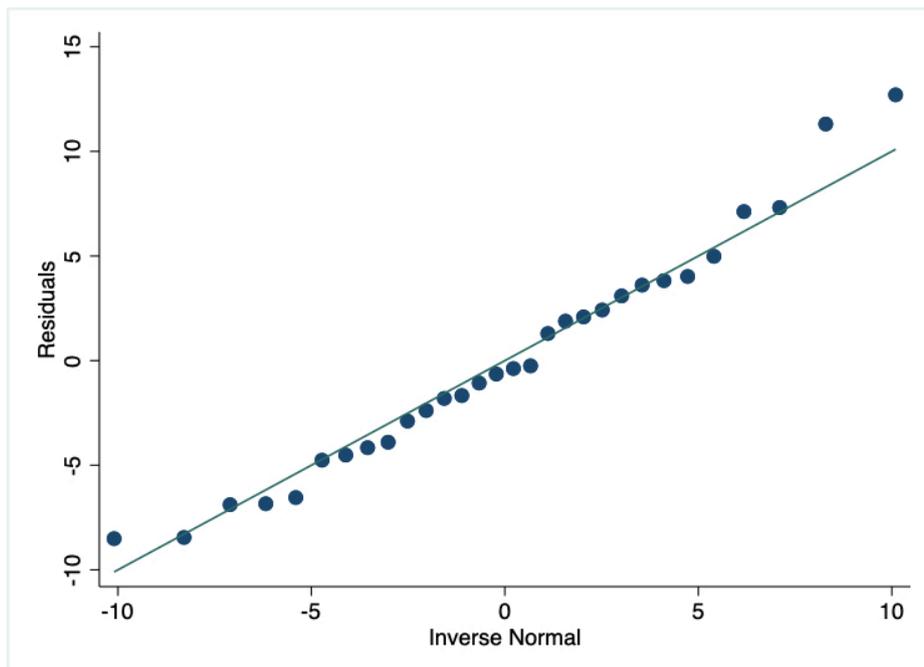
Graph 6: Stage 2: Residual's Normal Quantiles Plot (Dependent Variable: Female Workers)



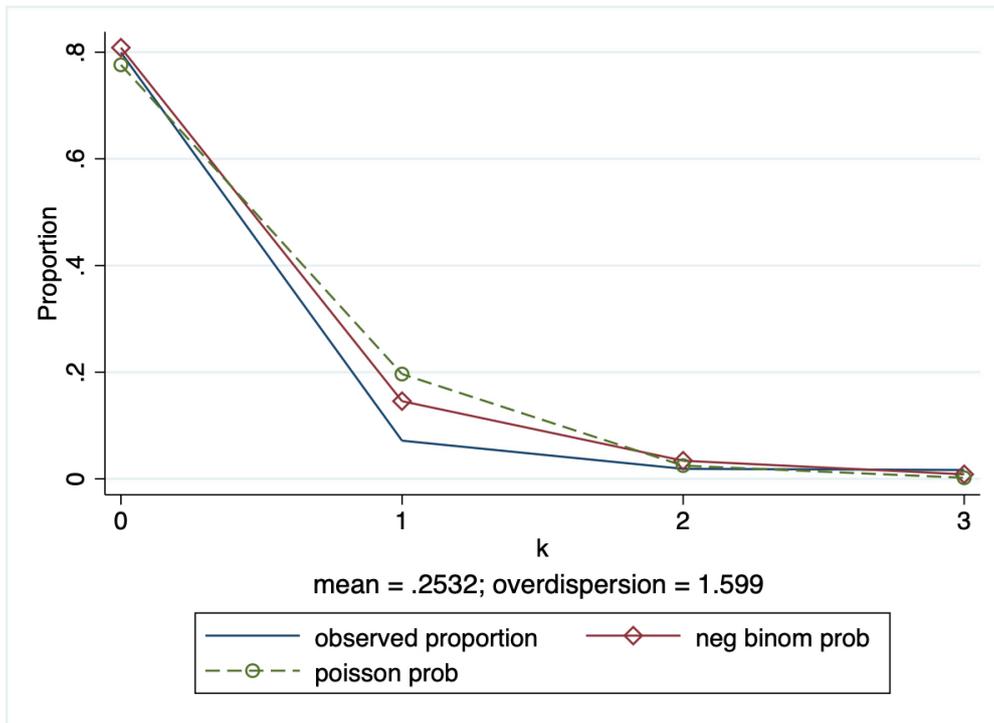
Graph 7: Stage 2: Kernel Density Estimation (Dependent Variable: Female Business Managers)



Graph 8: Stage 2: Residual's Normal Quantiles Plot (Dependent Variable: Female Business Managers)



Graph 9: Stage 3: Poisson & Negative Binomial Probabilities (Dependent Variable: Asset Ownership)



Appendix C: Regression Outputs

Stage Two: WEE and Financial Inclusion on a Macro Level

Table I: OLS Regression

| STAGE 2: RELATIONSHIP BETWEEN FINANIAL INCLUSION AND FEMALE ECONOMIC ACHIEVEMENT | | | | |
|--|-----------------------------|-----------|-----------|-----------|
| | Ln(Female Business Manager) | | | |
| Physical Integrity | -1.026* | -1.102** | -1.212*** | -0.934* |
| | (0.587) | (0.396) | (0.418) | (0.456) |
| Discriminatory family | -0.848 | -0.342 | -0.447 | -0.661 |
| | (0.643) | (0.588) | (0.664) | (0.711) |
| Restricted civil liberties | 0.102 | 0.149 | -0.0537 | -0.0126 |
| | (0.526) | (0.365) | (0.357) | (0.342) |
| Son Bias | -0.0759 | -0.355 | 0.140 | 0.460 |
| | (0.999) | (0.783) | (0.703) | (0.789) |
| Mobile Money Account | 0.982 | 0.864 | | |
| | (0.882) | (0.755) | | |
| Financial Institution Account | -0.693 | | -0.514 | |
| | (0.951) | | (0.883) | |
| Formal Borrowing | -2.935 | | | -4.063 |
| | (2.830) | | | (4.223) |
| Female-to-male Labour Force Participation Rate in 2017 | 0.00774 | 0.00874 | 0.0105 | 0.00922 |
| | (0.0116) | (0.0112) | (0.0114) | (0.0113) |
| Female Employment | -8.35e-05 | 0.000974 | -0.00293 | -5.80e-05 |
| | (0.00990) | (0.00718) | (0.00763) | (0.00708) |
| Legal differences in ... | | | | |
| ... Entrepreneurship | -0.00987* | -0.00681 | -0.00944 | -0.0113* |
| | (0.00497) | (0.00589) | (0.00605) | (0.00645) |
| ... Pay | 0.00243 | 0.000925 | 0.00306 | 0.00364 |
| | (0.00410) | (0.00336) | (0.00334) | (0.00336) |
| ... Workplace | -0.00264 | -0.00302 | -0.00178 | -0.00153 |
| | (0.00344) | (0.00365) | (0.00363) | (0.00359) |
| Constant | 3.919*** | 3.182*** | 3.605*** | 3.667*** |
| | (1.201) | (1.080) | (1.250) | (1.166) |
| Observations | 30 | 30 | 30 | 30 |
| R ² | 0.578 | 0.546 | 0.523 | 0.537 |

Robust standard errors in parentheses

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

Table II: OLS Regression

| STAGE 2: RELATIONSHIP BETWEEN FINANCIAL INCLUSION AND FEMALE ECONOMIC ACHIEVEMENT | | | | |
|---|----------------------|---------------------|---------------------|---------------------|
| Female Fulltime Worker | | | | |
| Physical Integrity | -16.91** (7.290) | -18.80** (6.734) | -18.40** (7.053) | -18.35** (7.863) |
| Discriminatory family | -15.04 (10.53) | -15.12 (9.988) | -11.38 (11.19) | -16.23 (12.24) |
| Restricted civil liberties | -6.050 (8.992) | -6.274 (6.206) | -7.763 (6.015) | -8.606 (5.899) |
| Son Bias | 8.738 (12.06) | 6.367 (13.31) | 12.03 (11.86) | 14.90 (13.59) |
| Mobile Money Account | 10.97 (13.53) | 12.81 (12.83) | | |
| Financial Institution Account | 6.410 (13.43) | | 8.820 (14.88) | |
| Formal Borrowing | -22.67 (77.74) | | | -21.52 (72.75) |
| Female-to-male Labour Force Participation Rate in 2017 | -0.0958 (0.163) | -0.0919 (0.190) | -0.0682 (0.192) | -0.0733 (0.194) |
| Female Employment | 0.184 (0.145) | 0.161 (0.122) | 0.156 (0.129) | 0.134 (0.122) |
| Legal differences in ... | | | | |
| ... Entrepreneurship | 0.00287 (0.125) | 0.0107 (0.100) | 0.00137 (0.102) | -0.0295 (0.111) |
| ... Pay | 0.0794 (0.0612) | 0.0772 (0.0570) | 0.0889 (0.0563) | 0.106* (0.0578) |
| ... Workplace | -0.114** (0.0400) | -0.116* (0.0620) | -0.103 (0.0611) | -0.0982 (0.0618) |
| Constant | 48.54** (19.67) | 50.37** (18.35) | 45.76** (21.06) | 53.73** (20.08) |
| Observations | 30 | 30 | 30 | 30 |
| R ² | 0.636 | 0.632 | 0.620 | 0.614 |

Robust standard errors in parentheses

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

Stage Three: WEE and Financial Inclusion on a Micro Level

Table III: Negative binomial, Poisson and Logistic Regression in Nigeria

| STAGE 3: RELATIONSHIP BETWEEN FINANCIAL INCLUSION AND FEMALE ECONOMIC ACHIEVEMENT IN NIGERIA | | | | |
|--|---------------------------------------|--------------------------|------------------------|-----------------------------|
| | Negative Binominal Asset Ownership | Poisson Wealth Index | Logistic Employed | Poisson Type of Earnings |
| Financial Institution Account | 0.0730 (0.0848) | 0.0936*** (0.00936) | 0.00141 (0.117) | 0.0659*** (0.0152) |
| Uses Mobile Money | 0.0106 (0.0858) | 0.0369*** (0.00875) | 0.137 (0.129) | 0.00689 (0.0148) |
| Who decides ... | | | | |
| ... her healthcare choices | -0.0709 (0.0536) | 0.0203*** (0.00638) | 0.325*** (0.0742) | 0.0100 (0.0113) |
| ... the household spending | 0.105** (0.0520) | 0.00521 (0.00649) | 0.640*** (0.0882) | 0.0255** (0.0125) |
| ... on visits to family & friends | 0.120*** (0.0365) | 0.00517 (0.00428) | 0.189*** (0.0406) | 0.00971 (0.00736) |
| ... what to do with money husband earns | 0.216*** (0.0434) | -0.00828 (0.00590) | -0.00470 (0.0685) | -0.0653*** (0.0110) |
| Attitude towards wife beating | -0.00150 (0.0736) | -0.0602*** (0.0103) | 0.0741 (0.0871) | -0.120*** (0.0188) |
| Can she refuse sex? | 0.162** (0.0787) | 0.00696 (0.00923) | 0.0963 (0.0922) | 0.0159 (0.0156) |
| Can she ask for condom? | 0.0266 (0.0635) | 0.0221*** (0.00825) | -0.0723 (0.0868) | 0.00898 (0.0137) |
| Age at first intercourse | -0.0241** (0.00964) | 0.00369*** (0.00101) | -0.0363*** (0.0122) | 0.00156 (0.00176) |
| Highest Education achieved | | | | |
| Primary | 0.101 (0.103) | 0.142*** (0.0163) | (0.0122) 0.389*** | 0.00594 (0.0217) |
| Secondary | -0.205** (0.103) | 0.285*** (0.0149) | (0.121) 0.226** | -0.00214 (0.0217) |
| Higher | -0.166 (0.132) | 0.325*** (0.0167) | (0.111) 0.180 | 0.0169 (0.0257) |
| Living with partner/husband | -0.0322 (0.126) | 0.00450 (0.0160) | (0.162) -0.0577 | -0.0763** (0.0345) |
| Female head of household | -0.0159 (0.0823) | -0.0648*** (0.00996) | (0.172) 0.152 | 0.0137 (0.0147) |
| Polygyny | 0.196** (0.0770) | -0.00549 (0.0103) | (0.114) 0.137 | 0.00429 (0.0149) |
| Rural | 0.235*** (0.0576) | -0.182*** (0.00801) | 0.149* (0.0773) | -0.0721*** (0.0122) |
| Religion | | | | |
| other Christian faith | -0.440*** (0.0692) | 0.0248** (0.0104) | 0.134 (0.124) | 0.0605*** (0.0206) |
| Muslim | -0.932*** (0.0934) | 0.0301** (0.0117) | -0.289** (0.127) | 0.134*** (0.0221) |
| Traditionalist | 0.00590 (0.362) | -0.0146 (0.0755) | 0.636 (1.067) | -0.232 (0.202) |
| Other Religion | -0.354 (0.346) | 0.172*** (0.0424) | -0.369 (0.428) | -0.0687 (0.0805) |
| Age | 0.0360*** (0.00370) | 0.00329*** (0.000485) | 0.0691*** (0.00560) | -0.000516 (0.000827) |
| Constant | -2.462*** (0.255) | 0.863*** (0.0307) | -1.000*** (0.0618) | 0.864*** (0.0520) |
| Ln(alpha) | -0.872*** (0.172) | | | |
| Observations | 5,467 | 5,467 | 5,467 | 4,466 |

Robust standard errors in parentheses

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

(Notes: Number of Observations varies across Regression)

Table IV: Negative binomial, Poisson and Logistic Regression in Cameroon

| STAGE 3: RELATIONSHIP BETWEEN FINANCIAL INCLUSION AND FEMALE ECONOMIC ACHIEVEMENT IN CAMEROON | | | | |
|---|--------------------------------------|--------------------------|------------------------|-----------------------------|
| | Negative Binomial Asset Ownership | Poisson Wealth Index | Logistic Employed | Poisson Type of Earnings |
| Financial Institution Account | 0.241*** (0.0866) | 0.0625*** (0.00861) | 0.543*** (0.126) | 0.0372** (0.0170) |
| Uses Mobile Money | -0.0149 (0.0698) | 0.0960*** (0.00847) | 0.102 (0.0858) | 0.0991*** (0.0171) |
| Who decides ... | | | | |
| ... her healthcare choices | 0.0961* (0.0570) | 0.00106 (0.00695) | 0.285*** (0.0746) | 0.0576*** (0.0134) |
| ... the household spending | 0.0709 (0.0575) | 0.000738 (0.00738) | 0.0764 (0.0722) | 0.0262* (0.0138) |
| ... on visits to family & friends | 0.0849** (0.0406) | 0.00683 (0.00476) | 0.134*** (0.0446) | -0.0115 (0.0101) |
| ... what to do with money husband earns | 0.151*** (0.0499) | 0.0196*** (0.00666) | -0.0992 (0.0679) | 0.0147 (0.0121) |
| Attitude towards wife beating | 0.175*** (0.0638) | -0.0482*** (0.00906) | 0.398*** (0.0862) | 0.0196 (0.0179) |
| Can she refuse sex? | 0.140 (0.0891) | -0.000797 (0.0109) | 0.437*** (0.103) | 0.0119 (0.0233) |
| Can she ask for condom? | 0.0538 (0.0785) | 0.0354*** (0.0104) | -0.364*** (0.103) | -0.0170 (0.0211) |
| Age at first intercourse | -0.0145 (0.0115) | 0.00598*** (0.00136) | -0.0315** (0.0147) | 0.00755*** (0.00272) |
| Highest Education achieved | | | | |
| Primary | 0.800*** (0.137) | 0.184*** (0.0170) | 0.663*** (0.123) | 0.0656* (0.0388) |
| Secondary | 0.723*** (0.147) | 0.287*** (0.0177) | 0.315** (0.136) | 0.0952** (0.0397) |
| Higher | 0.548*** (0.190) | 0.345*** (0.0197) | 0.0766 (0.195) | 0.145*** (0.0434) |
| Living with partner/husband | -0.414*** (0.0869) | -0.00873 (0.00847) | 0.0819 (0.0872) | 0.0609*** (0.0166) |
| Female head of household | 0.0143 (0.0813) | -0.0518*** (0.00962) | 0.0945 (0.101) | -0.0459** (0.0199) |
| Polygyny | 0.299*** (0.0837) | -0.00555 (0.0127) | 0.168 (0.106) | -0.0807*** (0.0274) |
| Rural | 0.428*** (0.0651) | -0.359*** (0.0105) | 0.577*** (0.0844) | -0.190*** (0.0189) |
| Religion | | | | |
| Protestant | 0.125* (0.0696) | -0.0290*** (0.00861) | -0.162* (0.0933) | 0.0159 (0.0174) |
| other Christians | 0.0666 (0.110) | -0.0173 (0.0137) | -0.0407 (0.148) | 0.0217 (0.0249) |
| Muslim | 0.0825 (0.0981) | 0.0488*** (0.0122) | -0.842*** (0.112) | 0.0998*** (0.0260) |
| Animist | 0.433 (0.424) | -0.197*** (0.0669) | -0.130 (0.528) | 0.0859 (0.0893) |
| None | -0.0199 (0.201) | -0.00475 (0.0262) | -0.298 (0.290) | 0.0210 (0.0789) |
| Other | 0.650*** (0.233) | 0.0159 (0.0405) | -0.421 (0.514) | 0.0377 (0.0827) |
| Age | 0.0490*** (0.00377) | 0.00226*** (0.000501) | 0.0627*** (0.00519) | 0.00227** (0.00109) |
| Constant | -4.644*** (0.300) | 0.867*** (0.0360) | -2.161*** (0.343) | 0.405*** (0.0807) |
| Alpha | -15.18*** (0.208) | | | |
| Observations | 4,197 | 4,197 | 4,197 | 2,973 |

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1
 (Notes: Number of Observations varies across Regression)

Table V: Negative binomial, Poisson and Logistic Regression in Benin

| STAGE 3: RELATIONSHIP BETWEEN FINANCIAL INCLUSION AND ECONOMIC ACHIEVEMENT IN BENIN | | | | |
|---|---------------------------------------|-------------------------|-----------------------|-----------------------------|
| | Negative Binominal Asset Ownership | Poisson Wealth Index | Logistic Employed | Poisson Type of Earnings |
| Financial Institution Account | 0.639*** (0.110) | 0.0478*** (0.0145) | 1.109*** (0.272) | 0.0480*** (0.0146) |
| Uses Mobile Money | 0.0101 (0.108) | 0.101*** (0.0126) | 0.176 (0.168) | 0.0177 (0.0144) |
| Who decides ... | | | | |
| ... her healthcare choices | 0.162** (0.0769) | 0.0102 (0.0114) | 0.440*** (0.132) | 0.00818 (0.0121) |
| ... the household spending | 0.139* (0.0791) | 0.0206 (0.0126) | 0.585*** (0.144) | 0.0245* (0.0138) |
| ... on visits to family & friends | -0.0747** (0.0363) | 0.00783 (0.00664) | 0.0933* (0.0547) | 0.0176** (0.00734) |
| ... what to do with money husband earns | 0.123* (0.0672) | -0.00673 (0.0100) | 0.0654 (0.116) | -0.00524 (0.0103) |
| Attitude towards wife beating | 0.0252 (0.0839) | -0.0495*** (0.0147) | 0.183 (0.128) | 0.0533*** (0.0136) |
| Can she refuse sex? | 0.0201 (0.0929) | 0.00317 (0.0155) | 0.325** (0.142) | 0.0264* (0.0152) |
| Can she ask for condom? | -0.0883 (0.0901) | 0.0526*** (0.0148) | -0.170 (0.140) | 0.00266 (0.0144) |
| Age at first intercourse | -0.0184 (0.0158) | 0.0142*** (0.00219) | 0.0581*** (0.0214) | 0.00262 (0.00235) |
| Highest Education achieved | | | | |
| Primary | -0.170 (0.106) | 0.117*** (0.0157) | -0.0511 (0.164) | 0.0182 (0.0156) |
| Secondary | -0.184 (0.113) | 0.155*** (0.0151) | -0.659*** (0.156) | 0.0181 (0.0171) |
| Higher | -0.219 (0.256) | 0.149*** (0.0204) | -1.758*** (0.373) | 0.0295 (0.0243) |
| Living with partner/husband | -0.0841 (0.0993) | -0.00442 (0.0140) | 0.0344 (0.151) | 0.0187 (0.0134) |
| Female head of household | -0.263*** (0.102) | -0.0225 (0.0145) | 0.224 (0.178) | 0.00181 (0.0141) |
| Polygyny | 0.354*** (0.0786) | 0.0180 (0.0134) | 0.451*** (0.132) | -0.00417 (0.0136) |
| Rural | 0.283*** (0.0821) | -0.226*** (0.0139) | 0.122 (0.124) | -0.0566*** (0.0137) |
| Religion | | | | |
| Traditional | -0.717 (0.779) | -0.0274 (0.110) | -0.202 (0.941) | -0.0790 (0.109) |
| Islam | -0.0995 (0.160) | 0.0175 (0.0321) | -0.451* (0.260) | -0.0296 (0.0248) |
| Catholic | -0.0735 (0.166) | 0.0740** (0.0314) | 0.0746 (0.271) | 0.0176 (0.0227) |
| Protestant Methodist | 0.269 (0.196) | 0.0501 (0.0383) | -0.458 (0.328) | -0.0233 (0.0364) |
| Other protestants | -0.235 (0.280) | 0.0976** (0.0388) | -0.0842 (0.385) | -0.00103 (0.0358) |
| Celestes | 0.0100 (0.200) | 0.0219 (0.0359) | 0.316 (0.334) | 0.0704*** (0.0230) |
| Other Christians | -0.0329 (0.177) | 0.0395 (0.0335) | 0.291 (0.298) | 0.00967 (0.0245) |
| Other religions | 0.206 (0.547) | -0.0570 (0.0687) | -0.507 (0.739) | -0.0661 (0.114) |
| No religion | -0.257 (0.274) | -0.0641 (0.0578) | 0.683 (0.511) | -0.0602 (0.0535) |
| Alpha | -0.318** (0.147) | | | |
| Constant | -1.475*** (0.357) | 0.919*** (0.0574) | -1.267** (0.539) | 0.812*** (0.0567) |
| Observations | 2,638 | 2,638 | 2,638 | 2,294 |

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1
 (Notes: Number of Observations varies across Regression)

Table VI: Negative binomial, Poisson and Logistic Regression in Guinea

| STAGE 3: RELATIONSHIP BETWEEN FINANCIAL INCLUSION AND FEMALE ECONOMIC ACHIEVEMENT IN GUINEA | | | | |
|--|---------------------------|--------------------------|------------------------|-------------------------|
| | Negative Binominal | Poisson | Logistic | Poisson |
| | Asset Ownership | Wealth Index | Employed | Type of Earnings |
| Financial Institution Account | 0.554*** (0.153) | 0.0251 (0.0185) | 0.508* (0.303) | 0.0600 (0.0837) |
| Uses Mobile Money | 0.148* (0.0894) | 0.0694*** (0.0147) | 0.214 (0.165) | 0.0308 (0.0601) |
| Who decides ... | | | | |
| ... her healthcare choices | -0.0781 (0.0520) | 0.00231 (0.0114) | 0.461*** (0.109) | -0.0770* (0.0399) |
| ... the household spending | 0.235*** (0.0420) | -0.00617 (0.0107) | 0.406*** (0.0860) | -0.0159 (0.0351) |
| ... on visits to family & friends | 0.0131 (0.0276) | -0.0172*** (0.00657) | 0.0824 (0.0505) | 0.0413* (0.0218) |
| ... what to do with money husband earns | 0.00907 (0.0464) | 0.00156 (0.0107) | -0.182** (0.0840) | -0.00145 (0.0338) |
| Attitude towards wife beating | 0.283*** (0.0706) | -0.0450*** (0.0136) | 0.451*** (0.107) | -0.131*** (0.0464) |
| Can she refuse sex? | 0.320*** (0.0592) | -0.0273* (0.0157) | 0.150 (0.114) | -0.0310 (0.0519) |
| Can she ask for condom? | -0.146** (0.0707) | 0.0829*** (0.0166) | 0.262** (0.128) | -0.0286 (0.0555) |
| Age at first intercourse | 0.00691 (0.00941) | 0.00467** (0.00204) | -0.00110 (0.0181) | -0.00817 (0.00775) |
| Highest Education achieved | | | | |
| Primary | -0.105 (0.0925) | 0.0604*** (0.0194) | 0.289* (0.165) | 0.0983 (0.0655) |
| Secondary | -0.366*** (0.123) | 0.127*** (0.0173) | -0.351** (0.174) | 0.124* (0.0665) |
| Higher | -0.362** (0.181) | 0.119*** (0.0222) | -0.516 (0.314) | 0.249*** (0.0951) |
| Living with partner/husband | -0.228* (0.133) | -0.0201 (0.0402) | 0.572 (0.370) | -0.103 (0.137) |
| Female head of household | -0.351*** (0.0913) | 0.00109 (0.0171) | -0.363*** (0.142) | 0.0497 (0.0605) |
| Polygyny | 0.194*** (0.0578) | -0.0141 (0.0147) | 0.142 (0.105) | -0.0221 (0.0465) |
| Rural | 0.791*** (0.0781) | -0.557*** (0.0151) | -0.163 (0.113) | -0.327*** (0.0491) |
| Religion | | | | |
| Christian | 0.300*** (0.0839) | -0.156*** (0.0266) | 0.732*** (0.205) | -0.141* (0.0759) |
| No religion | 0.245 (0.151) | -0.117 (0.0949) | 1.316 (0.902) | -0.556 (0.340) |
| Age | 0.0112*** (0.00320) | 0.00270*** (0.000862) | 0.0329*** (0.00615) | 0.0112*** (0.00271) |
| Constant | -2.343*** (0.220) | 1.319*** (0.0459) | -1.345*** (0.132) | 0.622*** (0.173) |
| Ln(alpha) | -29.38 (0) | | | |
| Observations | 2,124 | 2,124 | 2,124 | 1,461 |

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1
 (Notes: Number of Observations varies across Regression)