EFFECT OF BIOMETRIC TECHNOLOGY ON THE EFFICIENCY OF BENEFICIARY PAYMENTS IN SOUTH SUDAN SAFETY NET PROJECTS

BY

NJOGA DENNIS OTIENO
REGISTRATION NUMBER: 17/00384

A RESEARCH DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF BUSINESS ADMINISTRATION CORPORATE MANAGEMENT IN THE SCHOOL OF BUSINESS AT KCA UNIVERSITY

NOVEMBER 2022

DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

Student Name: NJOGA DENNIS OTIENO Registration No: 17/00384

Sign: _____ Date: 18th November 2022

I do hereby confirm that I have examined the master's dissertation of

NJOGA DENNIS OTIENO

And have certified that all revisions that the dissertation panel and examiners recommended have been adequately addressed.

Sign: _____ Date: _____

DR. SIMON MWENDIA

Dissertation Supervisor

ABSTRACT

The safety net projects are currently spread in over 131 countries where 2.5 billion people are benefiting from the program with 650million of them being drawn from the poorest. The safety net project comes in the form of non- contributory transfer programmes aimed at alleviating poverty amongst the poor and a shock cushion to the vulnerable thus to achieve an effective and efficient payment exercises in the Safety Net Projects that is benefiting the forementioned mission, there is need to address the fundamental challenges of positive identification of beneficiaries, the diversity of cultural practices that may be stumbling block, illiteracy and societal rot which have been constant thorn in the flesh towards achieving efficient beneficiary payments exercise. The research was carried out to study the effect of biometric technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects. Specific objectives were to ascertain the effect of Biometrics technology on beneficiary identification, naming convention, payment to the illiterate and safeguards in achieving efficient payment exercise. The study derived its theoretical navigation from the Identity Theory, Theory of Naming, Principle of Verification Theory and The Fraud Triangle Theory. The study applied Descriptive research tactic. Closed ended Questionnaire distributed by means of proportionate stratified sampling was instrument used in data collection that was used in regression analysis where a Target population of 1,309 hailing from the Seven states and one administrative area comprising of Central Equatoria; 421, Eastern Equatoria; 218, Jonglei; 110, Upper Nile; 116, Warrap; 219, Western Bahr El Ghazal; 116 and Pibor; 109. responded. Northern Bahr El Ghazal was excluded as only two beneficiaries were registered. Attained data was analyzed using excel and STATA where various analysis such as exploratory factor analysis, normality, Linearity, correlation and multiple regression analysis were carried out. Key research findings were presented by means of percentages and frequency distribution, measures of central tendencies summarized in graph, tables and figures. The study established that positive beneficiary identification and safeguards was critical to the success of beneficiary payment process. The study also presented that the biometrics technology would significantly help in the circumnavigation of the cultural practices which results into beneficiaries possessing similar names as well as making light the burden faced by the illiterate who struggled with passwords, PINs and signatures to the efficiency of beneficiary payments. The study suggested the proposal of adopting biometrics in all Safety Net Programs, setting up of consolidated data base for efficiency and deduplication, consider conducting education, fortification of beneficiary selection and enrollment criterion. Suggestion submitted to future researchers that they consider exploring the most effective biometrics technology model options as well as running a deduplication to address beneficiary's registration with aliases.

Key words; Efficient beneficiary payment, beneficiary identification, naming convention, illiteracy, safeguards

ACKNOWLEDGEMENT

My utmost most sincere appreciation to the Almighty God for according me the opportunity to undertake this research project. Secondly, to my Supervisor Dr. Simon Mwendia for the guidance, patience, responding to all my calls, texts and mails with all readiness to support. The KCA University for the gracious enrolment, School of Graduate Studies and my Lectures who took me through this master degree course work. To Family and Friends for the moral support. My Directors and Colleagues, Thank you.

TABLE OF CONTENTS

DEDICATION

To the Almighty, maker of the universe, to my late Mother- Kasisi Julia, my family, KCA University and all the beneficiaries of the safety net across the globe. This is to you.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS/ ACRONYMS

AAH	Action Africa Help
CfW	Cash for Work
EBP	Efficient Beneficiary Payment
GRM	Grievance Redress Mechanism
GRSS	Government of the Republic of South Sudan
IDP	Internally Displaced Persons Camps
ISDS	Integrated Safeguards Data Sheet
IOM	International Organization for Migration
KPS	Kenya Payment System
KYC	know your customer
MNO	Mobile Network Operators
NBA	National Basketball Association
OLS	Ordinary Least Squares
PM	Payment Mechanism
PDO	Proposed Development Objective
PID	Project Information Document
PLC	Public Limited Company
RTGS	Real Time Gross Settlement
SP	Social Protection
SNP	The safety net project
SSSNP	South Sudan Safety Net Project
UNOPS	United Nations Office for Project Support
UNHCR	The United Nations High Commissioner for Refugee
WB	The World Bank

DEFINITION OF TERMS

South Sudan Safety Net Project- non-contributory transfer programs in the forms of conditional as well as non- conditional cash transfers, food distribution or in- kind supply of essential goods, public works undertaken to earn daily income, price reduction of essential commodities in the form price subsidies and fee waivers on fundamental services such as medical and education that are primarily aimed at lifting the living standards of the poor or cushioning the vulnerable to shocks

Beneficiary Identification- Positive verification if targeted individuals selected to benefit in the South Sudan Safety Net program

Naming Convention- The cultural practice of naming children where the forename, middle name and surname are subjected to a specific sequence and logic.

Illiteracy level- The percentage of the masses that either have little or no formal education

Safeguards- Risk mitigation or fraud management and mitigation measures put in place to frustrate fraudulent endeavors

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

The safety net project (SNP) comes in the form of non- contributory transfer programmes aimed at alleviating poverty amongst the poor and a shock cushion to the vulnerable in over 131 countries reaching out to 2.5 billion direct and indirect beneficiaries drawn from the poorest (The World Bank, 2019). The SNP is contended primarily through conditional and non- conditional cash transfers as well as in- kind supply of essential goods like food distribution (Alderman, 2014). Efficient beneficiary payment disbursement equals successfully executed Safety Net Project. Unfortunately, effective payment exercises in the Safety Net Projects across the globe are face a myriad of challenges, amongst these challenges, issues relating to positive identification of beneficiaries, cultural practices, illiteracy and societal rot seem to be constant thorn in the flesh. First, Identification of beneficiaries where registration of persons done at birth stood at 51% in 2012 globally. The other 49% not registered presents enormous challenges for a nation which includes border security, national and fiscal planning, structural development as well as a myriad of administrative facilitation by the authorities (Hunter, 2018). According to Focus Group Technical Report on national identity programs (2016) rolled out in 48 countries established national identity card issuance coverage were either not specified or did not attain the 100 percent coverage, 33 out of the 48 countries including South Sudan fell below 50 percent. The low level of legal document issuance to the masses presented a clear gap in respect to supporting the beneficiaries who do not possess any legal document yet identified or qualify for the safety net and skills as a beneficiary (Dahan & Sudan, 2015). Identification cards functionalities ranged from facilitating financial services delivery, health care, social interactions, agricultural endeavors, elections, surveillance and security to travelling across jurisdictions.

Secondly, cultural practice on child naming is a fundamental phenomenon across the globe. Example given, only the grandparent figures of the community have the right to naming new born in the Tshivenḓa tribe (Mahwasane & Tshifaro, 2019). The Italians and the Romans embraced naming convention of a forename and surname, distinctly referred to as praenomen and nomen respectively (Salway, 1994). Middle name is most domains used as a third identifier (Merryl, 2016). South Sudan adds a new twist to the commonly adopted sequence. A country of about 10 million people with around 64 tribes whereby Dinka, Nuer, Azande, Baari and

Shulluk account for 65 percent of the entire set. Broken down as 36%, 16%, 6%, 4% and 3% respectively. The aforementioned including most of the rest amalgamated names their children with a forename, followed by the father, grandfather the great grandfather. The difference being on the forename where the Dinka named after cattle attributes, while the Baari speaking tribes have a specific name for first, second, third and fourth born in that sequence (Burton, 1992). The forenames additionally reflected the prevailing conditions at birth which cuts across from weather condition, season, wars, famine et cetera as the clan deemed fit (Sawe, 2017).

Third issue on literacy from the world perspective indicates that adult literacy levels stood at 67.55% in South Asia and the north of Africa while the sub- Saharan Africa trailed at 59.76% in comparison to Europe, West Asia and North America that now commands about 90% literacy levels (UNESCO Institute for Statistics, September 2015). A red flag in South Sudan where literacy levels stood at 27% (Achuil, 2020). Financials serves access was directly correlated with education and literacy levels (Shem, Misati and Njoroge, 2012). The World Bank Report- State of Social Safety Nets (2018) made an estimation of about 1.6 billion adults who comprised of women and the poor domiciled in the rural areas did not hold a bank account as at 2018. This somewhat placed them amongst the vulnerable and marginalized. The report further states that 3.8 billion people now have either a bank account or mobile money wallet, translating to 69% of the World population. Confirming that 1.7 billion is not a small number of adults and must not be ignored. Biometrics payment option is likely to create the needed efficiency to help achieve the safety net mandate of moderating the plight of the vulnerable (World Bank Report, 2018).

Cash transfer has flourished as an essential policy instrument in tackling vulnerability and inequality. The payment mechanism (PM) which serving as the back bone should be well able to serve purpose from the source of funds through the chain to the ultimate beneficiaries in dire need. It is fundamental to get the process right done the right way to and for the right people. Unfortunately, payment mechanism seems to incline towards disconnect, inefficient, plagued with errors, fraudulent awards and corruption (Ninno et al, 2013). This misfire affects the efficiency of the payment exercise

1.1.1. Biometric Technology

The term Biometrics sprouts its roots from a Greek origin, dissected into two words ‘Bios’ and ‘Metron’ whereas the latter means measure while bios means life. Therefore, bio and metron put together would then mean life and measure which is then complemented with

authentication act of confirming legitimacy, correctness or trustworthiness about, by and for a biological being are true with certainty (Bhattacharyya et al, 2009). Biometrics Technology can then be described as the identification or recognition based on physiological or behavioural characteristics of mortal creation (Gao, 2012). A description that is also closely tied to (Farik et al, 2016) insinuating that biometric user authentication is a modus operandi that identifies and authenticate a person or creature grounded on the quantification of their unique physique or behavioural peculiarity. Biometric solution can be described as technological innovation that performs the task of verification and authentication in the efforts of distinguishing and singling out various individuals' biological unique attributes extracted by way of biodata scans of the fingers and hand geometric patterns, facial frame characteristic recognition, eye retina and iris patterns as well as the foot prints. According to (Malathi and Jeberson, 2016) biometric is a technological functionality of analyzing and measuring biological data. They position their argument on the basis of security playing a vital role in this digital world and proceed to point out the merits of biometric as an ideal biometric identifier being its uniqueness and stability in the apparent consideration.

The Biometric technology raises the bar from the conventional authentication alternatives which have revolved around physical validation by authorities like the area administration chiefs, use of passwords, pin codes, signatures and ink finger print captured on paper which have all served purpose with heavy impact and are still being utilized in all manner of environments, situation and occurrences. Biometric technology gains more clout to a higher pedestal by virtue that the other aforementioned options are faced with limitations such as infrastructure especially in the remote setting and more so the literacy levels which stood at 27% according to (Achuil, 2020) echoing the Government of the new nation of South Sudan's Education Minister's key note speech during the International Literacy Day 2020 celebration confirmed the literacy position as the lowest in Sub- Saharan Africa. Bridging the above with the perspective of (Shem et al, 2012) who while trying to unearth factors that drive financial usage, presented a finding indicating that levels of education as one of the factors that had a direct correlation to households having accessibility to financial services. The limited access to physical and technological infrastructure has created a conducive environment for biometric technology solution as the alternative remedying the sorry state of affairs.

The key functions of biometric technology, namely; law enforcement that cuts across a myriad of uses especially criminology. Secondly, border control in the efforts of preventing identity fraud as well as strengthening of border and national security. Third function being consumer or residential biometrics which they categorized as standalone products like

smartphones, surveillance and access controls and finally, the financial services with primary motivation of protecting money were captured as the four main areas where identification or recognition based on physiological or behavioural characteristics of mortal creation was critical above other myriad of uses according to (Wencheng et al, 2019). They further dissected the biometric technology architecture and infrastructure, expounding that the architecture and infrastructure comprise of four censorious performances working in synchrony to achieve the protection mandate and the ability to accurately recognize an individual. These features being; sensor or the detector module that calls forth the biodata image that will then be utilized as the primary sample or principle signature exhibit that will used to validate an individual in future for the purposes of subsequent transactions, the detection is then followed by the extraction component feature that will spool from the database the previously stored biodata for the purposes of matching up against the presently scanned biological features for onward validation and verification that will result into a positive or a negative match of the party undertaking a transaction exercise. The validity, authenticity of legitimate beneficiary is made possible by the trine function of storage, where the specimen sample biodata forms the templates loaded on the database as the recorded biodata that will be called out upon at every point in the future to validate, verify and authenticate the rightful user. The final critical function when a database with specimen samples is in place, is the process of undertaking the of exercise of comparing the bio data filed in the database against the scanned live query of the user. This process of matching the stored against the live to ascertain that the user present being validated is indeed the user to whom biodata was collected and stored at the onset. The two images being the previously stored image against the live biodata scanned for verification and authentication purposes (Wencheng et al. 2019)

1.1.2. The Safety Net Program

Safety nets programs can be defined as non-contributory transfer programs in the forms of conditional as well as non- conditional cash transfers, food distribution or in- kind supply of essential goods, public works undertaken to earn daily income, price reduction of essential commodities in the form price subsidies and fee waivers on fundamental services such as medical and education that are primarily aimed at lifting the living standards of the poor or cushioning the vulnerable to shocks (Alderman, 2014). The above definition sprouts from a wider view point that defines Safety nets as being non- contributory transfer programmes aimed at alleviating poverty amongst the poor and vulnerable to both poverty and shocks. The fundamental design and pursuit of these programmes are embedded in supporting the

households make more improve and enhanced investments that will support their future, risk management from the front of ex-post and ex ante which means to undertake protective measures whilst also rolling out insurance for the risks possibly in play, other considerations, if needed to help alleviate poverty amongst the masses considered transient and chronically poor, source of income, income redistribution thus aiding economic growth (Subbarao, 2003).

The architecture of the safety net programmes is intentionally and deliberately drafted to serve three main deliverables. First and foremost is the offering of protection which is referred to as ex post, subsequent being the act of placing an insurance cover which is referred to as ex ante and last but least is the effort of alleviating of poverty through redistribution of income and stirring of economic growth (Dev et al. 2007). who further annotated that the motivations were encomiastic and many a times than not imbricated where both income redistribution and economic growth intertwined. A case in point, an effort to offer protection ending up alleviating poverty within the masses. The structural design and the nature of the major social safety net programs across the globe tend to possess varied attributes from one program to the other. This is because these programs hold similar primary focus and goal that are simply being implemented in diverse geographical location. These disparities or rather the variation in designs is somewhat caused by the prevalence and significance of different types of risk that are likely to emerge in a particular given country where natural disasters or acts of God being a factor in these considerations. “Cushioning vulnerable population from shocks through social protection systems” is captured as a fundamental component as prescribed by the G20 Development Working Group of deliberate intent to hunger and malnutrition. A clear indication of strong political goodwill across the globe (Banerji & Gentilini, 2013).

A paradigm shift dubbed “quiet revolution” has been encountered within the safety net programs with the rolling out and expansion of social protection programs to households within 131 developing and emerging countries, 98 of which are already running social safety nets at a national scale while other 33 countries implementing the same but still at the trial phase by employing innovative pilot initiatives, notably so, 22 of the latter fall within the Sub-Saharan Africa (Barrientos and Hume, 2008). The World Bank release, understanding poverty (2019) singled out the social safety net programs as the cover in place that has been offering protection to families from the damages and impact of economic shocks, occurrences that qualified for crisis and acts of God inform of natural disasters to a tune of 2.5 Billion people benefiting from the program with another 650 million drawn from the poorest block of the society, whereby the latter of beneficiaries accounted for 56 percent of the masses considered destitute. These efforts served in helping countries provide a source of income to its Citizens translating to

improvement on the living standards whilst growing their human capital base of the nation through an assortment of interventions extending from the typical cash transfer interventions to school feeding supporting the education sector in addition to public works where identified beneficiaries are enrolled to undertake labour intensive public works in exchange for wages that will support their livelihood.

1.1.3. Biometric technology and Payment of The Safety Net Program

South Sudan Safety Net Project appraisal document report number PAD3194 (2020) tends to raise the pertinent risk concerns high lighting the heightened operational, fiduciary, and safeguards that do affect the effective dispensing of cash to the vulnerable. This is to mean that probable manipulation and influence in respect to the entire process of targeting, identification and payment to the beneficiaries is a peril that jeopardize the success and perfect intent of the project. Elite capture of project rewards fuels the fiduciary risk in that the privileged and those in authority exploit and maneuvered the project in their favour for ill gained rewards is of grave concern in the achievement of the desired output. Therefore, the report points out the need for investment in structures that will help solidify the fundamental as well as crucial safety net tools to boost capabilities that will comprehensively mitigate if not totally eradicate a myriad of risks to somewhat guarantee effective dispensing of cash to the beneficiaries enrolled in the SSSNP. A position supported by (Pingali et al, 2019) who debated a justification that safety nets played a role in the shifting of economic structure, demographic evolutions and everchanging livelihood patterns in the context of gearing efforts of achieving urbanization with emphasis on urban poor whereby they called for diversifying of policy to incorporate tools such as information and communication technology that will curtail dishonest enrichment and leakages that would lead to undeserved outflow from the safety net programs.

Cash based interventions are increasingly being adopted as an important tool for tackling poverty and inequality in developing countries, with many International organizations implementing large scale cash transfer programs aimed to offer comprehensive access to social security and livelihood as well as offering dignity of choice in how to meet beneficiaries needs. These organizations comprise of the arm of United Nations responding to Refugees- United Nations High Commissioner for Refugees (UNHCR) along side the International Organization for Migration (IOM) dealing with immigrants of whom most are fleeing for fear of their lives as captured on the website just to mention a few alongside the United Nations Office for Project Support and Action Africa Help. The latter two having implemented World Bank driven interventions in South Sudan. Therefore, what is coming out clear is that cash complementing

to a range of in-kind assistance, notably food distribution, dwelling place, pharmaceutical supplies and wider support to better living with a bottom line of positive impacts of these cash programs on human, social and economic development.

Further reference to Safety Net Protect report number P169032. The fourth point on Report Number PIDISDSC25999 (2018) expound on the conventional social safe guards in the country adopting the path whereby the funding is entirely by the donors community supporting a myriad of efforts for instance altruistic essential relief aid. This is an exemplary reference of an ideal project by the development associates which are commissioned to keep afloat and cushion the underprivileged and most susceptible households. To this regard, it is of interest that the rightful and beneficiaries in the identified localities worthy of the assistance actually get to benefit from the program whilst ensuring measures to cut of impersonators, frustrate fraud attempts and tighten the adherence to correct procedural practices in respect to hard currency encashment in addition to other issues exasperating the success of the project that are malicious and retrogressive.

The above-mentioned challenge of awarding illegitimate and undeserving members of the community should by all means be addressed tactfully by the project implementing organizations and the commercial bank making the actual payment encashment being careful not to violate the Basel Act standards as well as any other national or international regulations formulated to guide, guard, supervise as well as risk mitigate the financial malpractice. These guidelines and regulations bind and directs the implementing partners and the paying Agent to only settle or make good payments to legit beneficiaries as per the target criterion. The targeting of the households within a set community base where recipients to benefit are identified for the project are registered using biometric devices where their unique bio- features are captured and stored, this then informs the payment mechanism of validation using the biometric device to achieve the desired safeguards screening as well as mitigate the risks of making illegitimate payments. The Grievance Redress Mechanism (GRM), supervision and oversight become less cumbersome (South Sudan Safety Net Project, PAD3194, 2020).

To work towards attaining an effective and accountable delivery of the safety net project and ensuring that it is indeed a going concern, there is need to employ tools, process flow and procedure that will enhance the quality of the project. A proposal of a comprehensive management information System (MIS), the biometrics devices and system will effectively support the payment, improve the reporting standard, data security due to the electronic nature as well as streamlined oversight functionality. Biometric authentication matching of biodata enriches the accuracy and supports timeliness of payment exercise with best level of guarantee

in respect to risk mitigation. The biometric mode of payment reduces to almost an elimination point the rising grievances that may require grievance redress mechanism being evoked to bring harmony in that risks will have been dealt, transparency to the universally accepted levels achieved thus feeding healthy cohesion (SSSNP- PAD3194, 2020).

1.1.4. The South Sudan Safety Net Program

The World Bank report ICR00004751 (2019) defines livelihood support development project dubbed the SafetyNet and Skills Development project (SNSDP) as an endeavour pointing towards uplifting living standards of the poor and the vulnerable in the society by rolling out projects that translate to temporary employment opportunities with an end game of providing income to support their daily sustenance needs together with placement of fundamental structures for social protection system that will transform their conditions for the better. This program, The Safety Net and Skill Development project, is a Government of the Republic of South Sudan (GRSS) propelled project in collaboration with The World Bank (WB) and implemented with equally strong partners like The United Nations under the specific arm called The United Nations Office for Project Support (UNOPS) and International Non- Governmental Organizations like Action Africa Help (AAH) as well as paying Agents- contracted commercial banks. The project aimed to enhance living standards by creating employment opportunities and remuneration among the less fortunate groups in the society.

The report further shades brighter light by illuminating important points to justify the context at the appraisal phase of the project. Namely: The country was experiencing an on-going encounter of insecurity and violence that contributed to an environment of protracted conflict translating to formidable development challenges at the time of the appraisal. Secondly, the report makes mention of chronic poverty that exacerbated the developmental challenges the country faced, outlined as poverty instigated by the civil war, emotional and psychological torture of the unfolded events, internal displacement of persons and refugees fleeing to other countries directly starving the strength of kinship and societal cement, endangering principles of participation, inclusion, transparency and accountability. The country was then ranked amongst the poorest countries lacking basic infrastructure as the third context while the forth context according to the report was the need for formulation of effective policies that will aid effective public administration, economic upward trend as well as improvement on the quality of life for all and as such identified the importance of social safeguards or protection (SP) in attaining the nation's augmentation ambitions. The post conflict and fragile state was captured as the fifth point on the report noting that the

Government suffered from weaknesses in administrative capacity, human and financial resources, and fiduciary accountability. The fragility that was witnessed sprouted the compelling demand to administer direct support to the underprivileged and most susceptible households through interventions to address the development challenges. The seventh context revolved around the provisional work plan by The World Bank through their Interim Strategy Note (ISN) aimed to help the newest and youngest Nation in Africa move from fragility state into stability.

South Sudan Safety Net Project is a sequel of the SafetyNet and Skills Development project (SNSDP) aiming to server about 66,771 new poor and vulnerable households that did not partake on the initial SNSDP intervention. This lot will primarily earn through labour intensive public work and conditional support where necessary (South Sudan Safety Net Project Report-PAD3194, 2020). The Integrated Safeguards Data Sheet (PID/ISDS) which is a Project Information Document tables at the concept stage Report No: PIDISDSC25999 (2018) by The World Bank South Sudan Safety Net Project (P169032) outlines its Proposed Development Objective (PDO) as provision of access to earning opportunities to the poor and vulnerable with an endeavour to strengthen safety net delivery systems. The less fortunate in the society languishing in abject poverty within the city as well as the marginalized lot dwelling in isolation in the form of Internally Displaced Persons Camps (IDP) as well as the masses residing in the deep far-flung remote areas of the country who happen to somewhat fit or meet The Safety Net and Skill Development Program selection criterion of a beneficiary. The South Sudan Safety Net Project and other such like programs are likely to face the naming aspect as a specific challenge that is instigated by the cultural naming practice amongst the majority of tribes within the country. The name award ceremony baptizing the first born is normally predominantly in honor of someone in the clan with the father's preceding the grand father's name following as the second and third name respectively. The great grandfather's name, a preponderance amongst most if not all tribes may be floated and awarded if and when desired. Which happens to be a very common occurrence. Therefore, it is highly likely that you will have a number of eligible recipients having two to four similar names arranged in the same order. The common illustration that comes into play is the family of the

celebrated professional National Basketball Association (NBA) player Lual Deng who has three brothers who hold of the name Ajou Ajou Deng Ajou Deng used interchangeably not to mention this exacerbate position is further made worse by polygamy which is well practiced especially amongst the Dinka and the Nuer tribes who desire to find strength in numbers. This means that it is highly likely that similarity in names will feature prominently amongst

recipients, especially if they come from the same locality or from similar lineage since they all belong to same father, their fathers are brothers or cousins where one man has about nine wives each having about six children while in some other cases like the Acholi who choose names based on surrounding circumstances at the time of birth ranging from climatic conditions, time of the day as well seasons. This is according to interactions with the South Sudanese during my stay in South Sudan as well as the available resources on South Sudanese name baptismal Cultural practices like Cultural Atlas Website (IES 2019) as a reference.

The naming convention roughens substantiation and certification efforts before making of payments an uphill task since relying on the identification documents as the sole mitigation measure will be insufficient to satisfy the verification of beneficiaries driven by the fact that only a small percentage of the population holds national identification card as the country is yet to solidify after coming out of long civil war that was followed by separation from the greater Sudan to form South Sudan as the latest and the fifty forth independent republic of the African continent. Lack of legal documentation and naming convention bewilderment frustrates duty of care makes substantiation and certification task tough. unless, perhaps the process incorporates physical verification of the recipient's biodata. Apropos of the aforementioned, directs us to exploring a model like biometric system as a suitable alternative of executing payment possessing the ability to tackle and overcome this huddle in the effort of delivering efficient payment exercise to the identified set of recipients where the contracted organization undertaking the project as well as the financial service provider comply set policies and regulatory standards which includes regulatory accord adopted worldwide like the Basel Act standards which was designed to offer regulatory statutes streamlining the standard as well as ring fence risk mitigation and solidified by sound supervision as regards the financial service provision. In this case, paying Agent in obligated to undertake measures that safeguards to ascertain that only the legit beneficiaries are paid with no cracks of funds landing in undeserving beneficiary.

1.1.5. Efficient Beneficiary Payments

Fruitful Safety Net Program intervention provide protection to poor rural people through income provision in form of cash transfer program, thus need for meticulous process at a time when food security within households has become a concern within the international communities' spheres (Gebresilassie, 2013). An approximately about 858 million people falls in the class of chronically under fed people in the globe (Babatunde et al, 2007). This means that getting the process wrong comes with a huge price. Unfortunately, it's the vulnerable who

will pay the cost of inefficient payment process. The World Bank in the efforts of aiding countries develop resilience has placed attention on improving social protection systems, data bank, information flow, adoption of knowledge dissemination and exchange, policies and lesson learnt from other previous experiences (World Bank, 2020).

Achievement of efficiently delivered beneficiary payment exercise calls for fiduciary compliance where the project design is well crafted, structured implementation, reporting, monitoring and evaluation that aids a process and outcome that is acceptable to all the stakeholders. Therefore, efficient payment should be guided by sound policies that would guide the process in terms of systems and technological logic like two factor authentication of the beneficiary preceded by registration and storage of bio data of the targeted beneficiaries (World Bank, 2019). Therefore, the application of structures that will weed out unjust enrichment through policies that will guide the targeting of beneficiaries and a technological mode that will subsequently and equally weed out awarding of cash payments to any other party not enrolled in the safety net project as a legitimate beneficiary. To achieve this, some sort of alternative to assist in the authentication of the beneficiary is paramount to a successful beneficiary payment within the safety net project.

1.2 Research Problem

According to the World Bank (2020), the objective of the South Sudan Safety Net Project (SSSNP) is to offer short term income opportunities to identified poor and the vulnerable households within the communities as well as to solidify and reinforce safety net delivery tools in the Republic of South Sudan. Amongst the many possible area of focus, the project will focus on three distinct components commencing with public works where the project will tend to increase labour intensive activities translating to income generation for the masses which comes with additional complementary support to the beneficiaries. The second component being conditional direct support providing direct cash disbursement to the poor and vulnerable households who do not have any able-bodied members who would otherwise be enrolled to participate in labor intensive public works in component one in order to receive remuneration for the same and finally, the third component focusing on pursuing efforts to enhance the safety net implementation tools and efficient management of the project. The end game is poverty alleviation and reduction of human suffering amongst the despairing masses across the various topographies of South Sudanese landscape.

To achieve the desired efficiency levels, there is need to address the challenges that tend to impede the achievement of efficient payment exercise (Acosta et all, 2019) thus

implementation of Biometrics Technology in the payment exercise is likely to sprout the desired quality and outcome where unjust enrichment of undeserving is cut out whilst performing positive identification of the beneficiaries who receive remuneration upon successful bio data scan verification at the payment point. A few research and enquiry have been undertaken in respect to value addition of biometric as a solution: According to (Yang et al, 2013) rallied efforts on biometrics safeguarding mobile payments where in their pursuit narrowed down to the benefits, obstacles and fixes revolving around biometrics in respect to security aspect of mobile payments, paying closer attention to the pros and cons thus fetching the significance biometric technology as a value add whereas (Sealy, 2018) scrutinized to critical need of understanding potential customer base in addition to the gains that biometric sensor integration presents in respect to payments implemented via biometric payments channel. An in- depth look into innovations in the biometrics souk which are rising to hold a fundamental position in peculiar identification and identification systems with the weight of the study looking at norms and perspectives in respect to payment methods (Mroz et al, 2022). Study taking the modification of technology acceptance model as the foundational research architecture where biometrics is given the apparent privacy as well as trust thus providing an extension to scrutinize end user acceptance of biometric identification in FinTech applications (Wang, 2021)

Noticeably, from the above study reviews, there is no substantial evidence nor resources about the the effect of biometrics technology on the efficiency of beneficiary payments in South Sudan Safety Net Project in respect to efforts of supporting legit beneficiaries without national identity card, positive identification of beneficiaries in the midst of naming convention being practiced, efficient payment to the illiterate as well as fraud mitigation is concerned. The objective of this study is to try fill the crucial gaps on this issue paying attention to safety net programs to communities in dire need for subsistence across the eight out of ten States of South Sudan as well as One out of three Administrative Areas of South Sudan. Hence this study is geared towards finding out the effect of biometrics technology on the efficiency of beneficiary payments in South Sudan Safety Net Project with a focus of bettering the performance of the beneficiary payments. The challenge of achieving effective and efficient revolves around the ability to resolve positive identification of beneficiary, singling out beneficiaries with similar matching names, support to the illiterate as well as position safeguards that would limit leakages in the form of frauds. The study will seek to unearth if biometrics technology will aid in addressing these challenges.

1.3. Objectives of the Study.

1.3.1 General objectives of the Study.

To determine the effect of biometric technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.

1.3.2 Specific objectives of the Study

- **i)** To establish the effect of biometric beneficiary identification technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.
- **ii)** To assess the effect of biometric naming convention authentication technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.
- **iii)** To evaluate the effect of biometric payment to the illiterate technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.
- **iv)** To establish the effect of biometric safeguards technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.

1.4. Research Questions

- **i)** What is the effect of biometric beneficiary identification technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects?
- **ii)** What is the effect of biometric naming convention authentication technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects?
- **iii)** What is the effect of biometric payment to the illiterate technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects?
- **iv)** What is the effect of biometric safeguards technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects?

1.5. Justification of the Study

Payments of whichever form or nature that is geared towards uplifting the livelihoods of the citizens especially the vulnerable speaks to the heart of the development project aimed at improving living conditions through cushioning against lack of basic essentials as well as equipping the masses with skills help catapult the economic towards favouring the wellbeing of the nation. Unfortunately, not all players or parties involved in the process either directly or by extension subscribe to mantle of integrity. It may be just one or a few individuals involved

in the process who will opt to veer off course in pursuit of selfish and personal gains. Using unorthodox tactics and incorrect ways of cheating the process to divert the resources intended for vulnerable members of the society identified to benefit from the South Sudan Safety Net Project into the hands of either undeserving beneficiary who mostly happen to be directly or indirectly linked to an official of any of the organizations involved in the project, more often than not being the local leadership of the quarter councils and or the implementing partners who somewhat has an upper hand in the selection of the beneficiaries. This does not mean finger pointing whatsoever but just throwing spanner in the wax to solidify loopholes of unjust enrichments where the physical hard currency paid by the paying agent lands in the hands of a deserving beneficiary for the value addition of the wellbeing of the community.

Therefore, giving such kind of process clean bill of health by simply using the paperwork will be a misguided approach cognizant of the fact that white collar heists are performed perfected paper documentation that are more often than not robust and convincing enough to cover the rot that lies therein. This is to say that a well- orchestrated paper work and documentation does not in any way ascertain nor is it tantamount to a well- executed payment exercise in favour of the identified, shortlisted then registered recipients whereby only the legitimate beneficiaries benefit from this emolument, use of biometric verification solution is applied at the point of payment attestation of beneficiaries is performed through validation of biodata using one or a number of the following options, namely; facial recognition, retina and iris scanning, palm of the hands, finger and footprints verified against the stored specimen sample biodata data at the point of selection. This forms a firewall protection layer mitigating against unjust enrichment, payments to phantom beneficiaries in addition to one beneficiary cashing out more than one payments.

Arguments against Biometric Technology where some experts may contend with the fact that technological advancement and innovations recently invented is supposed to steer the economy towards cashless payment environment, sprouting an argument that adoption of biometrics solution to undertake payment would come with substantial capital and operational expenditure that range from setting up teller encashment booths, hiring additional personnel to support the actual payment exercise, the arrangement and logistics for cash-in-transit, insurance costs in addition to the risk that be associated with hard currency handling. According to (Aranuwa and Ogunniye, 2012). the fundamental dilemma hindering growth and development advancement within the African continent is the deficiency in terms of electronic payment choices as a suitable substitute that is dependable and guarantees security lessening the occurrences of plastic robberies especially for card not present transactions, online hackings

and worse being the identity theft. South Sudan as a nation still does not have a payment switch supporting the nation transactional products in the form of infrastructure like the Kenya Payment System (KPS) that facilitates Real Time Gross Settlement System (RTGS) of transactions within the banking sector. important to note that none of the two mobile network operators (MNO)- MTN South Sudan and Zain South Sudan have rolled out mobile money like MPesa although three private companies namely: MGurush and NilePay have since launched mobile money that will take a while to build up due to heavy technological, financial and physical infrastructure required to fully take off as well as good will and trust from the masses. In addition to the fact that will fully and heavily depend on Zain South Sudan infrastructure who will also eventually hope to roll out their own mobile money. MTN South Sudan have also been pursuing the license assiduously but yet to fully roll out. This means that Biometric payment option may be the most suitable option to deal the elephant in the room.

1.6 Significance of the Study

1.6.1 The Government and the Donor Community

This study will go a long way to reestablish and solidify assurance, trust and goodwill that the funds released actually fulfills the intended purpose of supporting the livelihoods of the vulnerable members of our communities and not diverted to the pockets of few corrupt individual pockets. The donor community will feel more comfortable releasing funds in support of the safety net and skills development projects bestowed with the confidence in regards to legitimate and deserving cash assistant recipients are identified and verified by way of biodata scanning using biometrics technology prior to payment being dispensed.

1.6.2 Audit justifications by the implementing partners

The study will be of benefit to the implementing partner(s) undertaking the community mobilization, public works processes, placement of the litmus test in respect to important audit checks and balances needed as far as audit qualification is concerned. The biometric audit trail goes to great heights to confirm that the actual registered beneficiaries were paid as was intended and that no funds were misappropriated nor stolen throughout the project face. The Biometric solution will bring this challenge of unjust enrichment, disbursement to phantoms as well as individual receiving numerous remittance will be brought to a halt.

1.6.3 Future Researchers

In future, Researchers may wish to delve deeper into the subject matter and as such all references points available will help the researchers make a stride in respect to narrowing down to the research gap that will set the environment for the research question that need investigation, analysis to arrive at the logical conclusion. Therefore, this means that this study will provide the literature review for their study in order to pursue either the research gap in question or to conduct a more in-depth study of the same to sprout insightful conclusion in the area of biometrics payment option as a solution to address beneficiary payments challenges experienced in the safety net development projects and other such like development projects.

1.7. Scope of the Study

This research project will be undertaken in Juba, South Sudan utilizing registration data of the South Sudan SafetyNet Project beneficiaries across the eight out of ten States of South Sudan as well as one out of three Administrative Areas of South Sudan. Namely; Jonglei, Northern and Western Bahr el Ghazal, Upper Nile, Warrap, Central, Eastern and Western Equatoria while Greater Pibor Administrative Area serving as the only administrative area enrolled in the program on the biometrics technology effectiveness towards achieving efficient beneficiary payments in South Sudan Safety Net Project. This study will run as from March 2021 to November 2022.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The second chapter specifically narrows down to the previous research tackling the subject matter, a review of vital literature that then help summarize the gap left as well as development of the conceptual framework and the variable operationalization. The chapter help obtain the beginning point upon reading through the published literature that fall within the area of interest in respect to the study thus setting the foundation and the basis for the missing pieces of the research.

2.2. Theoretical Review

2.2.1 Identity Theory

The Identity Theory originated by Sheldon Stryker in 1968 (Stryker,1987: Burke and Stets, 2009) who built the take of the theory on the premise of an effort to derive from the traditional interactionist context. A position that enabled the commencement of the argument on identity theory by pausing the question of what does it mean to be who you are? Then proceeding to elaborate and define identity as the set of meanings elaborating who one may be in the circumstance where the individual is inhabiting a particular role in the dwelling of the native association, belonging to a specific grouping or possess an entitlement some particular characteristics. Burke's further exposition insinuates that defined appearances, characteristics, description and personalities serve as point of reference (Burke and Stets, 2009)

Human identity theory and social identity theory Identification Theory. According to (Lopucki, 2001) builds on the argument in regards to the theory of human identification holding that from an expanded point of view, identity traits and characteristics of all human are somewhat engulfed in a similar model. The identification process involves gathering and matching off of the characteristics extract observed from the first human against the same in the second observation in an intended end result to check whether or not this is one and the same person or could exist a possibility indicating otherwise (Lopucki, 2001) further goes to argue that additional information defining the characteristics used as the attributes for identification such as date of birth, social security details and the mother's maiden name being known to the various onboarded participants in the credit reporting system adds weight to the theory. Incorporating the above characteristics and any other supernumerary should be a characteristic that is widely utilized. The bottom line reads to making incorporations that will help reduce or frustrate identity theft. These incorporations entail bringing personal

information to light by not encouraging secrets that would substantially affect identity and identification of the masses. The argument that self-categorization was relevant to the formation of individual's identity in equivalent measure as far as identity theory is concerned whereby classification was reliant to named and classified world (Stryker, 1980)

Criticism of the identity theory by (Hogg et al, 1995) pointed out that there were consequential resemblance and imbricate on both social identity theory and identity theory, pointing out that the imbricate may eventually aid the connection of both theories in a constitutive fashion. They stated three factors and brought the same to perspective by implying that the theories had varied bases of identity as the first element central to the two theories. Secondly, activation of the theories and the concept of salience while the third is the core process rising once identity is activated. Setting the centre stage according to (States and Burke, 2000) for cognitive process of depersonalization and self- esteem process in social identity theory while the element of own or internal substantiation as well as own worth in the theory forming the synergy towards a general theory of self.

Criticisms of the theory pointed out five controversial concerns. The Professor of psychology and at active researcher raised that the corresponding connection was bigotry betwixt group identification and ingroup as the first concern, self- confidence or esteem hypothesis, the discordance nature of intergroup discrimination in respect to the positive negative imbalance, the consequence of the intergroup alikeness and comparability as well as the options of identity plan of action by group of stunted status (Brown, 2000).

This theory will principally be fundamental to this survey by the virtue that the theory addresses the knowledge of belonging from a social classification context thus servicing purpose (Hoggs and Abrams, 1988). Therefore, the study will use identity theory as the basis to beneficiary identification and verification to support in helping achieve the question of seeing what extend will the biometric technology support the efficiency of beneficiary payments.

2.2.2 The Theory of Naming

The Theory of Naming is linked to John Stuart Mill who is believed to have founded the theory in 1843 (Braun, 2006). Names act as compass points that help point us to masses' way of being as well as socio- cultural experiences giving deep insights to the beliefs, cultural patterns and norms, ideologies and religion practices of the people (Egyekum, 2006). This comes on the back drop that naming practices have humongous socio-cultural, deep spiritual and impactful

psychological connotation within and beyond the Africa continent (Mensah, 2015). Names are meaningful nevertheless they only perform the function of denoting items building from the fundamental concern of whether or not names have any meaning whereby the composition of agnomen in language happens inside the frameworks of philosophy (Anderson, 2007)

Inconsistency question according to (Anderson, 2007) goes further to raise that there were numerous yet inconsistent theories attempting to shade light to illustrate this endeavor emanating from the scholarly input by grammarians and philosophers such as Plato and Aristotle of Ancient Greek. Their opinion as far as names were concerned were defined by the Stoic's distinction of names categorized into proper and common. Boiling down to two important concerns in regards contemporary discussion on names revolving around a specific opportune moment of using a name in addition to what the name specifically insinuates in regards to the particular occasion within philosophical framework. Two morphological theories of proper names are elaborated and reviewed. These theories are considered Burge's remedy for proper names as complex demonstratives and Larson and Segal's quasi-descriptivist account of names. These theories then checked for empirical plausibility.

Captured by scholars, names as well as naming practices are somewhat intertwined and holds close link to cultural values and beliefs (Su & Telles, 2007). Essentially, names present meaningful information in respect to personal attributes, example being their religious belief, affinity, gender and ethnic grouping (Bodenhorn and Bruck, 2006) subsequently, this forms that naming not being discretionary branding nor incribing process (Rymes, 1996). This argument builds further with claim that names are deeply bonded incorporating individual's identity (Goodenough, 1965). A name is a component on one's self and inaugural point of building one's sense of who they are (Dion, 1983). This is supported by (Aceto, 2002) who argued that and I quote "an imminent or latent identity is influenced by multiple names" where by there was numerous interrelationships with components like language, spirituality, ethnicity, kinship, gender nationality or social status which are socially constructed components.

Scholars have also criticized the naming practice and self- identity by first acknowledging the affiliation between names and identity but watered down by digging onto what the names meant to the masses who had been baptized and how the naming practice did not help nor aided how they contextualized themselves (Kim,2007: Kroskrity, 1993; Thompson, 2006). The definition of self was established as the mentalities and practices associated with being an 'I' being a person or a subject in a certain society group thus to be able to capture the rightful identity of the beneficiaries, this argument will help us focus on addressing the naming

convention for this study according to (Shweder et al.1998). Opposition of the theory occasioned by the fearfulness of the anti- metaphysical implication despite the recording of negligible impact where criticism described as virile sprouted from the actual desire to clarify notion and working out the theory's amiability to experimentation as well as phenomenalism (Nelson, 1954). Therefore, the study will use theory of naming to see to what extend will the biometric technology support the efficiency of beneficiary payments where by the use of theory will aid the study circumvent the element of belonging as part of subject in a particular community and chain link cultural values and beliefs revolving around naming convention where similarity of names is common factor.

2.2.3 Principle of Verification Theory

The principle of verification was developed by A J Ayer in 1936 (Ryle, 1951). Exposition by (Tamunosike and Chrisantus, 2018) making reference to Alfred Jules Ayer's verification doctrine, a factor that dominated their scholarly input on logic, truth and language. Logical positivism, a philosophical evolution that germinated in the 1920s with its inspiration and drive coming from empiricism and verificationism. Ambition fueled by adherence to their own 'Verification Principle' held firm with pride and adoration as their only criterion for the verification of meaningfulness for cognitive proclamation. The acceptability and usage of the doctrine steered the positivists into rejecting as problematic the myriad assertions of metaphysics together with ethics and religion. "Who am I?" is a question that steers an individual or body corporate to pursue self- concept, an assemblage of beliefs on own self which is a part and parcel of social identity framed from the view point of belonging to matching social cluster (John & Penny 1986). Social identity theory presents the picture that portrays the group dynamics as in the form of systems of behaviour as well as the psychological processes within a social group and the interaction between two or more social groups (Tajfel & Turner 1979).

Doctrine of Verification or Verifiability Criterion also referred to as Verificationism. All refer to one and the same thing. They mean that the doctrine that a proposition is only cognitively meaningful if it can be definitively and conclusively determination renders the position to be either true or false. The elating factor of the principle presses that it must be possible to depict possible observation made so as to determine whether or not a hypothesis is correct. An additional weight added to the principle according to (Mulder et al, 1979) which stated that the connotation of a proposition is the manner by which verification was articulated

by (Ayer, 1936)". In other words, the doctrine of verification functions as the mode of validating the circumstances by which a proposal will be validated as the truth. Carnap (1928) American philosopher but born in Germany, pursued and advancement into making fundamental inputs to exposition and philosophy of science over and above the fundamentals of probability and inductive logic. Steering away from verification to making confirmation via an explanation that a content is testable if the procedure is known whilst a content is confirmable if the kind of evidence is known thus affirming the position (Carnap, 1928). Today verification and validation is regarded as principal technique of exuding confidence through schematical presentation in respect to development of mathematical and computational model in ascertaining justification and authentication (Kwasniewskia & Bojanowskib, 2015). Therefore, the study will use Principle of Verification Theory to see to what extend will the biometric technology support the efficiency of beneficiary payments in that the theory will help the researcher approach the study with effort to address matters truth and logic in order to bring meaningfulness.

2.2.4 The Fraud Triangle Theory

The Fraud Triangle Theory was first developed in 1953 by Donald Cressey. He was an American criminologist who kicked off his study of fraud by arguing that everything people do is driven by some underlying factor or reason (Schuchter, 2013). In his quest, he was keen to answer the question why do people commit fraud cognizant of the violation of trust that is apparent (Cressey, 1950). A position that was further supported by (Abdullahi and Mansor, 2015) that every perpetrator of fraud is normally faced by some pressure driving them to commiting the unethical behavior. Cressey (1950) in a period of 5 months, interview 250 criminals and thereafter presented the findings that pressure to commit fraudulent, grasped opportunity and rationalization are the centre and fundamental drivers that fuel fraud (Cressey, 1953) summarized these three elements as the fraud triangle. Albrecht, Albrecht, Albrecht and Zimbelman (2009) conquered that fraudulent actions, irrespective of whether it is done under coercion or as an agent of an entity, the act is always composed of the three elements (Albrecht et al, 2010). spiced the source by arguing that the fraud triangle is interactive, insinuating that the greater the perceived opportunity or the more intense the pressure, the less rationalization it takes for someone to commit fraud. Nonetheless (Rae and Subramaniam, 2008) argue that fraud is a complex matter and is a function of a combination of factors. They supported their position by making claims that fraud did not occur in some instance where internal controls

were poor presenting ripe ground for to commit fraud yet in other instances fraud occurred whereby employees managed to circumvent the internal controls to commit fraud in the present of good internal controls. The accounting practice, system development designed to enhance efficiency, strengthening of formulated policy for sound implementation, protection of assets come valuables or mitigation fraudulent or error occurrences can be defined as internal control. This emanates from the fundamental definition of control as the activity of managing or employing oversight and regulation over operations of some nature is referred to us control (Arab & Jamshedy-Navid, 2009). Internal control positions as an instrument and means that assist in controlling risk thus aiding organizations to perform tasks and accomplish its goals (Vaclovas & Lukas, 2012). Internal Control is a fundamental component of managing an organization. It encompasses the strategies, procedure and process flow applied to fulfill the vision, mission, goals and objectives abetting management practice that is performance based. The emphasis is the ability of the controls decreasing or mitigating all together the risks associated with undetected blunders or irregularities (Arab & Jamshedy-Navid, 2009). "Internal control is a process for assuring of an organization's objectives in operational effectiveness and efficiency, reliable financial reporting, and compliance with laws, regulations and policies" (Barnet Council, 2020).

Watered down, the fraud triangle that it does not directly apply to the actual fraud occurrence as far as financial crime is concerned and argued that forensic accounting researchers and practitioners should put into account for consideration the n-dimensions of financial crime whereby fraud is only a subset (Dennis, 2017). "Fraud in the society is like an opportunistic infection that bursts forth when greed meets the possibility of deception." (Abayomi, 2020). Therefore, the study will use Fraud Triangle theory to see to what extend will the biometric technology support the efficiency of beneficiary payments by appreciating why people commit fraud and addressing the motivation and the opportunities that lead to the enticement or frustration thereof to proceed with fraud attempt in order to appreciate safeguard component of the study

2.3. Empirical Review

This section presents a review of literature based on studies undertaken by other scholars. The review will be guided by the research objectives.

2.3.1 Beneficiary identification on the efficiency of beneficiary payments.

An effort to establish the effect of Social Safety Nets Governance Strengthening in East Asia (Giannozzi & Khan, 2011) whose study focused on coordination of the safety net programs, identification criterion, competence of the administration, transparency and accountability employed in the process. The target population of 20,000 enrolled in the cash for work in the National Social Protection Strategy. Data collected through community participation, Government Database and observation. There was a detailed analysis undertaken. The research showed that there was need to enhance coordination that was lacking, deal the ambiguous beneficiary identification and selection criteria that will be easily achieved through improved accountability and beneficiary involvement enabling transparency in the process (Giannozzi & Khan, 2011). An endeavor to determine the effect of the lack of capability to authenticate own self while interrelating with the governing authority or formal institutions like banks (Gelb & Clark, 2013) whose study focused on formal identification is a precondition for improvement in the current world. The target of the study was 160 cases of biometrics used for identification in an economic, political, and social environments and purposes in developing countries. The data was analyzed and research showed that there was need to have identification proposal to be considered as a key element of development policy rather than a program supporting the deliverables by the donor community.

Question of what constituted best practice for emergency operations in respect to tallying and identifying of beneficiary affected populaces. The study: 'Counting and identification of beneficiary populations in emergency operations: registration and its alternatives,' conducted amongst the Kurd population that fled into Kaliche and Hafez camps for safety following the enormous displacement of Kurd from Northern Iraq in 1991. A questionnaire administered through a thirty- cluster sampling survey was rolled. The findings highlighted need for accuracy where protection function is achieved through elevated level of accuracy. There was need for population identification and qualification activities being guided and administered with worldwide standards for human right and dignity (Telford, 1997). Factors that shape efficient printing and issuance of National Identity card. The study primary objectives were to ascertain on how financial resources affect production of identity card, assessment of how an effective feedback system influences card production, investigation into how Information Communication technology influence identity card production, determine how decentralization may influence identity card production and an assessment of how the registration and replacement processes can be improved. The population for the study comprised of 118 members of staff at the National Registration Bureau staff. A questionnaire was administered

in the study. Statistical Package for Social Sciences was used to process data. The study output indicated that a significant number of respondents knew that the application process was manual and centralized thus need for automation and decentralization as a fix the registration of person thus dealing identity crisis (Mwacharo, 2013).

An investigation into the factors that influence timely registration of persons in Kisumu city Kenya. The specific objectives of the study were to assess the influence of registration requirements and systems, capacity building done on the staff dealing with registration of persons as well as looking place an assessment into the infrastructure of the department that handles registration of persons. The population for this study was 1093. The respondents comprised of national identity card applicants, Government Administration chiefs, Assistant chiefs, Identity vetting elders and registration officials. The research used interviewing guides and closed ended questionnaires as the data collection instrument. The data was analyzed interpreted and summarized. The findings of study established that the registration requirements were not easily accessed, centralized registration system had inefficiencies, registration officers were not adequately equipped neither was the infrastructure up to date thus hamper the effectiveness and efficiency of the National Registration Bureau translating to delay in registration of persons. Recommendations made were formulate easily accessed registration requirements, decentralize production operations within the counties, capacity building and introduction of modern technology to enhance efficiency (Onyango, 2014).

2.3.2 Naming convention on the efficiency of beneficiary payments.

Accessing the effect of data system harmonization in respect to cash transfer exercises during emergencies. The study focused on looking into the way the different humanitarian agencies collected data information, how they utilized the registration and validation information in fulfilment of the cash transfer programmes into Somalia whilst identifying the opportunities, risks and barriers to determining an effective integrated data system. The target population for this study was 50 organizations and 41 key informants. Primary and secondary data were both used where a review of published literature, grey literature and interviews the various relevant stakeholders, namely; humanitarian agency representatives, donors and government officials was conducted. Content analysis technique undertaken in conducting an in-depth analysis of the qualitative data. The research found out that the collection of registration data and the identification of the masses were fundamentally founded on the policies, guidelines and standard operating procedures of the various organizations in solitude which then of cause

result into numerous non-interoperable data systems. Efforts made so far to try achieve harmony. Unfortunately, some constrains are still limiting the efforts. Theses constrictions range from technical, political, financial to organisational factors, legal, fiduciary, reputational as well as data protection risks. The study concluded that harmony presented opportunities in the long run (Owino, 2020).

Effort to establish the efficiency of Know Your Customer Policies Adopted by Commercial Banks in Kenya in Reducing Money Laundering and Fraud Incidences. The principal objective of this study was to establish the current know your customer practice, the level of compliance and the general effectiveness of the policies in reducing fraud and money laundering cases in commercial banks in Kenya. The study adopted all the 43 licensed commercial banks. Data from both primary and secondary sources was used in the study by means of structured questionnaire was tabled to account opening officers, risk and compliance management team whilst the secondary data was obtained from the banking fraud prevention unit of the Central Bank of Kenya. Data processing and analysis done and presented in graphs, pie charts, bar charts and tables. The study concluded with the opinion that know your customer strategies in isolation would not adequately control cases of money laundering as well as fraud that are being encountered in commercial banks. This calls for placement of measures in form of policies and procedures that would enforce compliance (Njagi, 2009).

Understanding the assessment framework in respect to beneficiary information quality focusing on possibility of single registry for the national safety net program. The study focused on seeking to identify a means to assess information quality with end game being refining the information in the registry. The research took the tangent of assessing the quality of the information, how to refine available information and proactively undertake information quality management. Target population of 84 registries being all the available registries. Interviews were used in data collection and 46 registries participated. Data analysis undertaken and results indicated that the information on the single registry was of worthy reputable value since it was viewed to be unbiassed. In addition, there was need for periodic review to sustain the level of information quality. This translated to accuracy in beneficiary information captured in the form of personal details, commencing with the name, personal information to the general biodata (Mwangi, 2016).

The effects of hunger safety net program on livelihood improvement in Wajir County, In particular, the study sort to gauge the effect of registration and targeting of beneficiaries, validation of program adoption levels by the government, if cash transfer stimulated the improvement of livelihood as well as cash management. The target population for this study

was 384 attained through the Fisher formular. Data collected through interviews schedules, questionnaires and on ground observations, thereafter data analyzed using statistical package for social sciences (SPSS) version 21.0. The research showed that cash transfer net program augmented retention and nurturing of families facing starvation and that the government played its role. However, from the findings a conclusion was drawn that there was need for a more transparency in respect to registration which then will aid households progress towards hunger safety self-sufficiency (Elmi & Minja, 2019).

2.3.3 Payment to the illiterate on the efficiency of beneficiary payments

Appreciation of the targeting practices and biases in social cash transfers experiences encountered in the rural environs in Malawi. The study focused on making assessment of the targeting processes as well as the associated challenges of Social Cash Transfers. The target population for this study was 335 households enrolled in a qualitative study for beneficiaries living in participating districts. Interview was used for data collection. Data analyzed and presented in figures. The research showed that almost half of the beneficiaries had no formal education thus need for modalities to support by placing structures that will make easy the wellbeing of beneficiaries (Jimu & Msilimba, 2018). The relationship between personal financial literacy and lending by commercial banks in Kenya. The study pointed out that an average person was considered financially illiterate. All the 43 Commercial Banks in Kenya licensed by the Central Bank of Kenya under the banking act as at 31st December 2009 were enrolled and incorporated in the census survey that was conducted. Primary data attained from the respondents through a comprehensive questionnaire which was then analyzed using Statistical Package for the Social Sciences version 17. Descriptive statistics enabled presentation of the outcome through frequency tables, percentages, means and standard deviations, Graphs and charts to provide conclusions on findings. The research insinuated that client understanding of the decisions and consequences is key and demonstrating serviceability thus if the client did not understand then there was need for additional intervention (Gatakaa, 2010).

The effect of economic empowerment of South Sudanese Women based in Bidibidi Refugee Camp of Yumbe District through cash transfers. The study's specific objective sort to answer, in which way and to what degree is the cash transfer programs function as a tool for economic empowerment for women. Secondly, in what way has access to cash transfer affected the day-to-day livelihood of women and their involvement in community affairs of the refugee camp

as well as the main sets of challenges women face and how can the cash transfer system be made more effective. The research took a tangent of placing emphasis on the voices and input of the women to help get their perception of economic empowerment, whether or not the cast transfer enhances women control in their respective households and exploration to identify factors that contribute to empowerment of women economically. The target population was 1,500 women refugees based in Bidibidi Refugee Camp. Semi- structured interviews and focus group discussions was used as the mode for data collection. There was a detailed analysis presented using figures and tables. The findings of the study showed that there was low level of education and that due to the illiteracy levels, the women almost fully depended on the cash transfer to meet their basic needs (Tasha, 2021).

Assessment into Social Cash Transfer impact on the beneficiaries in Chadiza District of Eastern Province. The primary focus was to make efforts of characterizing if cash transfer had socioeconomically advanced the lives of the beneficiaries, placing focused scrutiny on the levels to which cash transfer had buffered the beneficiaries against impingements and state of vulnerability whilst distinguishing the challenges that beneficiaries experienced. Target population of the study selected 50 beneficiaries through stratified random sampling. Data collection was done via interviews to the primary informant, focus group confabulation as well as observation. The findings of the research revealed that the cash transfer had served purpose of ameliorating livelihood of the beneficiaries who were then able to access health care in addition to purchasing essential commodities. The study concluded that the programme gained real strides in enabling the vulnerable forefend against poverty and vulnerability (Lonia, 2020).

An investigation into the effect of cash transfer to the older persons living in the rural areas that were to benefit from the order persons cash programmes, Unambiguously, the study focused on a full scope audit by reviewing all the processes from the national to the local level and went further to identify all the parties involved through the process. Secondary data of records from the government as well as media records, non- governmental organizations records and data from publications related to cash transfers was used to investigate the cash transfer to the senior citizens. Descriptive research design was applied. The data was collected and analyzed. The study flaunted that despite the challenges, there was substantial benefit to the livelihood of the senior citizens. The study made a proposal of having the programmes factor in all the senior citizens, meaning all citizenries above the age of 65years (Kubai, 2021).

An investigation into social protection interventions focusing on the effect of social cash transfers on financial inclusion in the republic of Kenya inspired by desire to encourage the financial inclusion. The target population for this study was 340700 enrolled beneficiaries.

Systematized questionnaire was used in data collection and analysis done using statistical Package for Social Sciences (SPSS) Version 21. The study established that Social Cash Transfers were described by minimal levels of formally banked beneficiaries as well as clear absence of cashless transactions. The study suggested need for indorsement of awareness campaign in the midst of the enrolled beneficiaries which included integrate financial literacy in the form of courses like financial management skill (Odero, 2014).

An investigation into the livelihood status of the urban poor in regards to efficiency instigated as a result of cash transfer programmes. The specific objective was to determine how the gender of the recipient, determine how the level of education of the recipient, establish how the size of the household and determine how the number of income earners in a household determine the efficiency of the programme on the livelihood status of the urban poor. Application of Krejcie and Morgan‟s sample size estimation was used in arriving at the target population, 322 household heads were enrolled in the study. The population was singled out by means of stratified random sampling from a target population of 2000 households. Descriptive survey research applied. Data collected using questionnaires and interviews thereafter an analysis using Statistical Package of Social Scientists Program. The findings of the study revealed that education levels were found to not play a significant function since the amount did not present meaningful elasticity in spending alternatives (Njoroge, 2013).

2.3.4 Safeguards on the efficiency of beneficiary payments

Efforts to gain an understanding of fraud risk management by narrowing down to the capability component of fraud theory pinning down to Nigerian banks in specific. The study was fixated to unmask the effect of malicious insider abuses, internal control bypasses, information security breaches as well as the impact of fraud risk governance on fraud risk management efficiency of Nigerian banking sector. The expended secondary data from thirty eight observations derived from quarterly report on fraud and forgeries of the Financial Institutions Training Centre. Test hypotheses of the four the independent variables were formulated and null hypothesis was tested using robust linear regression analysis. Stata 14.2 was used in data analysis. The findings presented negative effect on internal control bypasses and information security breaches on fraud risk management efficiency whilst study also presented an insignificant positive effect of malicious insider threats and fraud risk governance on fraud risk management efficiency. The repercussion of these findings to the Nigerian banking sector meant that the sector was confronted with both inhouse and external fraud competency

challenges in the same measure which necessitated the need for management to devote keen attention, undertake education and awareness campaign to sensitize the various stakeholders. The study offered comprehensive fraud vulnerability suggestions incorporating all stakeholders affected by the banking sector thus improving on fraud risk management (Eze et al, 2022). Determination whether or not fraud has an effect to the efficiency of banks as well as customer deposit level. The study focused of the fraud occurrences on the deposits transacted by customer deposit and impact evaluation the bank's efficiency. The target population was all the twenty- one banks in Nigeria. The study utilized secondary data from 2008 to 2017. The outcome of the study presented finding that fraud had abundant negative effect on customers deposit in Nigeria banks and in addition to that efficiency of the banks were hampered to a serious degree. The recommendation was to solidify internal control to subdue fraud cases incidences for the banks (Adenike & Alao 2020).

Seeking to determine the impact of fraud and corruption on the effectiveness of customs duties collection. The study focused on discretional interface, accountability, controls and the network of accomplices with the main aim of pinpointing the intentions instigating fraud as well as corruption, risk evaluation and appraisal of substantial misstatements occasioned by fraud and establish strategies to counter fraud whilst noting the effectiveness of the developed strategies. The target population of 70 individuals comprising of finance officers, internal audit team, control officers and operations personnel. The study also employed secondary data of published revenue report running from first month of 2009 to first month of 2014. The study presented that there was no connection between fraud corelating with revenue collection (Cosmas, 2015).

The study investigated extensive fraud penetration and sort to gain an understanding and thereafter possible interventions in respect to fraud within public service organizations. 54 systematically selected public service organizations was selected employing a cross-sectional study approach. They pursued the investigation using a survey design and case approach that ameliorated the outcome of the study to that indicated that the fraud risk reduction strategy that had been adopted was not effective in reducing the overall level of employee fraud occurrences within the public service organizations. The study presented weak audit monitoring and an indication the reward system and compensation system did not facilitate reduction of incentive for employees to commit fraud (Duke II & Kankpang, 2012).

An examination into commercial banks in Kenya to ascertain if corporate governance had effect fraud occurrence within the banking sector. The study targeted to check the magnitude to which the tone of leadership and management team, the weight of prudential stop gap

measures mechanism put in place by the regulating authorities, senior team compensation structures and the degree to which response strategies in regard to fraud by commercial banks in Kenya affect the number of fraud incidences. The study applied positivism research philosophy and descriptive correlational research design with a population sample size of 13092 comprising of both staff and senior management of all the 43 commercial bank in Kenya that are under the supervision of the Central Bank of Kenya. Primary data through a structured questionnaires with data exploration computed using descriptive statistics and inferential statistics of Pearson's Correlational Analysis. The finding of the study confirmed that the tone of the top and compensation structure of the top leadership had significant correlations amount lost to fraud, frequency and recovery rate. The prudential control systems by the regulator on the other hand indicated that the controls aided the lowering the amount of fraud losses whilst enhancing fraud loss recovery proportions (Ogola et al, 2016).

Pursuit of establishing the influence of fraud risk management practices in commercial banks and their effect on fraud risk exposure. The specific objective was to find out the combined effect of fraud risk management practices, fraud prevention as well as fraud detection on fraud risk incidence in Commercial banks in Kenya. The study enrolled all the 43 Commercial banks licensed to operate in Kenya singling out the population using stratified random sampling in determination of the sample size to build the data collection. Convenience sampling method used due to banks confidentiality policies. The study adopted primary data obtained through questionnaire and interviews. Data was processed using statistical package for the social sciences software generate statistics and used to make conclusions and generalizations. The research outcome was gained by means of descriptive statistical method indicating the commercial banks were incorporating a number of fraud risk mechanism to detect and prevent inherent risks whilst employing efforts to manage existing fraud risks. The study also red flagged the real time gross settlement as one of the components recording high number of fraud occurrences which resonated with although to somewhat lower extend was cheque kitting, account opening, computer fraud and credit cards frauds. The study echoed the need for information sharing to mitigate fraud happening from the same possible set of fraudsters and giving the fraud prevention wholistic approach to combat the menace (Gikiri, 2012).

2.4 Knowledge Gap

The scholarly review undertaken thus far provided a good perspective to the independent variable being investigated in isolation. The Authors have given us hindsight on matters by first, looking into identification criterion, competency and transparency thus eliciting accountability of the targeting process revolving around authentication and identification. Secondly; in regards to naming where the Authors positioned the weight of know your customer (KYC) as an essential engagement element, registration and targeting of beneficiaries, quality of beneficiary information and data system harmonization in respect to beneficiary identification. Third being the literacy levels within the sub-Saharan Africa especially amongst the poor and vulnerable members of the society stood out as a real concern. Finally, on matters fraud prevention and mitigation, prudential stop gap measures mechanism as well as influencing fraud risk management practices that leads to capacity enhancement and assessment of fraud impact. This builds into the elaboration of the introduction which shed light on naming convention factor of the major tribes that command 64 percent of the total population where similarities are no peculiar consideration, the alarming illiteracy levels as well as the fraud and societal rot which is a challenge world over that affect the beneficiaries where some issues are out of their control but some can be sketched as cultural and their way of life.

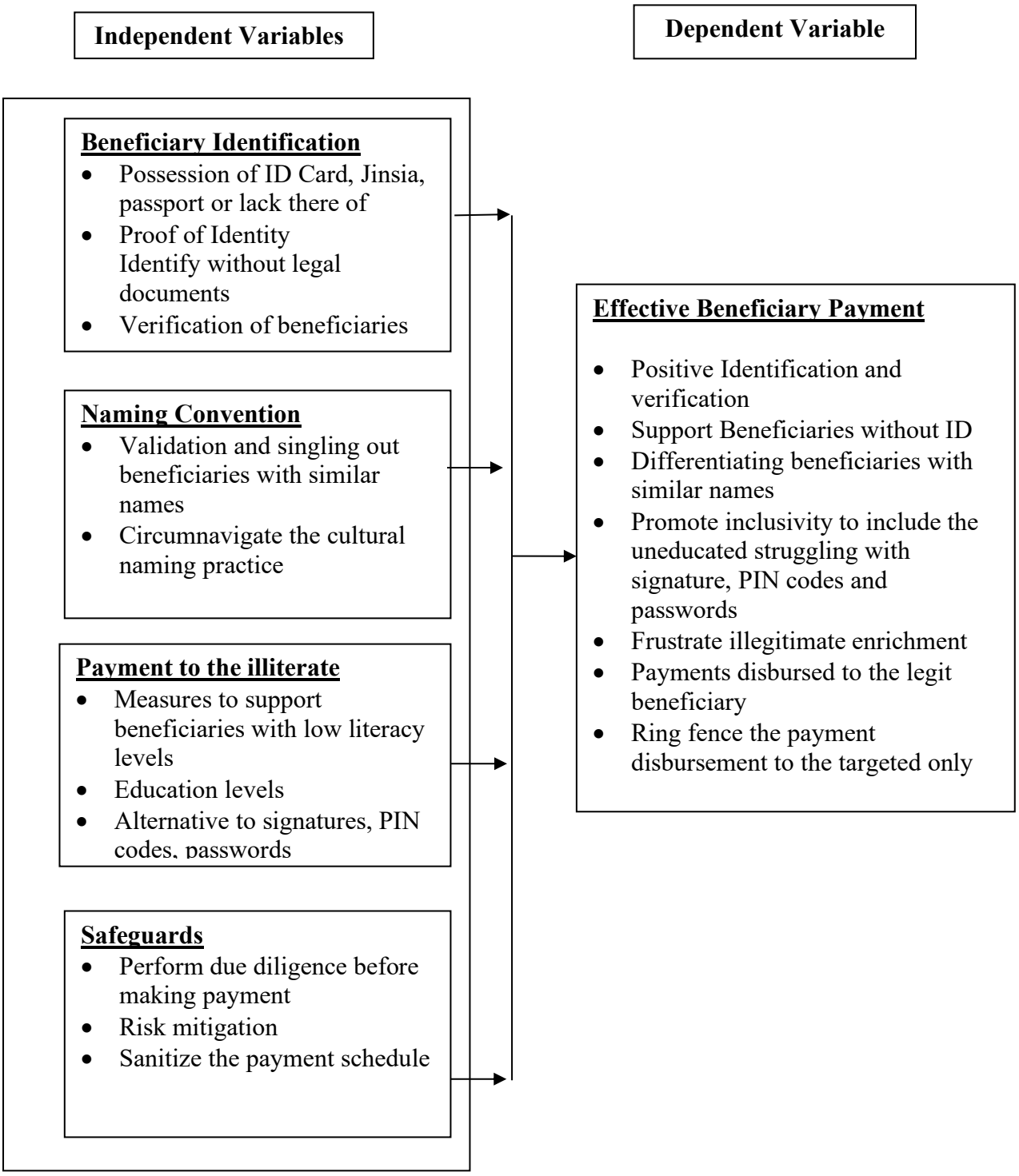
A proposal of running the biometrics technology applying tokenization at point of sales was tabled to substitute plastic payment model (Garg & Garg, 2015). This position was seconded by Kumar & Ryu (2009) who threw their weight behind Biometrics technology presenting convenience by replacing personal Identification Number (PIN) and passwords. Biometrics playing the role of authentication, identification that aids access controls and linkages between an individual and the biodata (Mroz, 2022). The authors have conveyed the issues around the aforementioned four challenges but leaving out how biometric technology would assist resolve beneficiary payments challenges experienced in the safety net development projects towards overcoming these challenges in the effort of achieving efficiency in beneficiary payment process. Beneficiary identification and verification, factors revolving around naming convention, high level of illiteracy as well as fraud have been tackled in a myriad of studies but the element of how biometrics technology can collaborate to address these challenges is lacking.

Convenience of authenticating identity, versatility, and benefit to the consumer are the keys for the acceptance and success of a new technology (Weiss, 2011). This study was conducted to try fill in the spaces which were not so far addressed in concurrence with biometric

technology enabling efficient beneficiary payments in South Sudan Safety Net program which remained unearthed as the authors were addressing the aspects independently. The study was fixated on beneficiaries lacking legal identification documents whereby lacking legal identification document is viewed to have a direct effect on possibilities and opportunities for full participation in social, political, and economic life (Harbitz & Tamargo, 2009). The naming convention circumnavigation built on the fact that the cultural practices will be here to stay amongst the various communities. The literacy levels with good will from all the stakeholders will gradually build but definitely over a period of time. Fraud and societal rot acknowledging that the payment mechanism somewhat not firmed up nor solidified enough to render efficient payment process free from errors, scam and exploitation (Ninno et al, 2013) thus the study will help resolve the beneficiary payments challenges experienced in the South Sudan Safety Net Projects where identification is not easy due to lack of legal documentation, beneficiaries holding similar names running in a similar sequence, uneducated without ability to contend with pin codes, signatures or passwords whilst fortifying the process with applicable safeguard measures.

2.5 Conceptual Frameworks

Figure 1. Conceptual Framework



Source: Author (2022)

2.6 Variable operationalization

Variable operationalization entails the convertion of the variables stated in conceptual framework into measurable observations. Operationalization is be defined as the development of specific research procedures that will result in empirical observations representing the concepts. In addition, the level of measurement must be exhaustive and mutually exclusive as the two key qualities of all elements. To paint a clear picture on the variables under investigation, a progression of pinpointing operations guides the sail to the show into achieving tangible conclusion.

Figure 2. Variable operationalization

Variable- Beneficiary Challenges	**Indicator for measuring the variable**	**Data to be collected**
Lack of Legal Identification Document as a challenge to beneficiary payments	Jinsiia National Identity Card Passport Document	- Jinsia Number - National Identity Number - Passport Number
Naming Convention as a challenge to beneficiary payments	Name of participants in the survey	- Name of participants to check for similarities - Family size - Monogamous or polygamous marriage
High Beneficiary illiteracy levels as a challenge to beneficiary payments	Level of education	- Enrollment letter - School Identity card - Completion Certificates/ Awards - Note on drop outs and never enrolled
Fraud and Societal Rot as a challenge to beneficiary payments	Number of Fraud incidents	- Fraud incidents reported

Source: Author (2022)

2.6.1 Lack of Legal Identification Document as a challenge to an effective payment process

Legal Identification Document is an essential and sometimes necessary when undertaking endeavors like payment exercises. It is a primary tool of physical verification and as such is a very important factor of concern in accomplishing effective beneficiary payment exercise. The legal document help paying officials perform validation and verification as a risk mitigation and due diligence process to run a clean audit and eliminate risk factor of paying a wrong beneficiary or making duplicate payments to one beneficiary. Furthermore, making presentation normally helps give clean bill of health in regards to managing all other stakeholders involved in the safety net and skills projects that range from the Government, Donors, Regulators of the paying Agents, Local Leadership and community as well as the public at large. Guided by the current situation where the many beneficiaries do not have any sort of legal document, the Biometric technology becomes a bridge that will help in the fulfilment of the safety net and skill mandate of improving livelihood.

2.6.2 Naming Convention as a challenge to an effective payment process

This is one element that will be around for as long as the key ethnic groups still strongly embrace their rich cultural practices. Thus, having many of the beneficiaries sharing names will not be a problem of the past in the foreseeable future. The culture especially around lineage, family size, polygamy and children naming is dearly followed and as such verifications will be a challenge noting the fact that you may have three siblings from same father but different mothers sharing the same names. Ultimately the issuance of National Identity Cards to all population will help reduce this challenge as mother's names is now being captured in the National Identity Cards. This exercise will take a while to conclude bearing in mind the country is trying to recover from the long civil war and has a number of other priorities with the limited resources gained from Oil well and taxes.

2.6.3 Illiteracy as a challenge to an effective payment process

The generations that were at the school going age during the 70s, 80s, 90s and early in the new millennium before the signing of the peace agreement at Naivasha in Kenya in the year 2006 were direct victims of the civil war with only the few who managed out getting education from the few countries that were willing to accommodate asylum seekers and refugees. The vast majority who were internally displaced did not get the privilege of getting education thus have remained illiterate. One of the painful effects of war.

2.6.4 Fraud and Societal Rot as a challenge to an effective payment process

The Fraudsters are normal people within the society that opts to acquire unjust enrichment due to availability of opportunity. People of such kind will tactfully or maliciously try to execute a payment that is not rightfully due to the beneficiary receiving the payment. This is easy when transactions are done using paper trail where anybody can sign received pretending to the actual beneficiary targeted and identified at the onset of the safety net and skills project. Biometric will help sieve out such characters who wish to make illegitimate gains by personification and ultimately help in the delivery of effective beneficiary payment exercise.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents description of the research methodology that will be used in the study. The methodology to be used includes research design, target population, sampling design and data collection and analysis procedures.

3.2 Research Design

The study used descriptive survey design, a scientific method which entails observing and describing the behavior of a subject without influencing by any means. Descriptive survey research designs are applied in initial and investigative studies enabling researchers to collect information, summarize, interpret and present for clarification purposes (Orodho, 2003). Mugenda and Mugenda (2003) equally conquers that the purpose of descriptive research is to determine and report the way things are while (Shanti and Alok, 2017) placed that descriptive research encompass survey and fact-finding inquiry of different kinds. Example given would be case-study, naturalistic observation, survey. The primary purpose of descriptive research is to explain set of circumstances as are presented. The Ex- post facto in research is a term that colludes to elaborate this type of research in different areas or subjects matters. Core feature of this mode is that the scientist holds no direct control over the variables and can only report the happenings (Mugenda and Mugenda, 2013) explained that the advantage of this design is that, the researcher has the liberty to use various forms of data as well as incorporate human experience.

3.3 Target Population

Kombo and Tromp (2006) argued in the following quote that "population is a group of individuals, objects or items from which the population will be taken for measurement or it is an entire group of persons, or elements that have at least one thing in common." In this case, this research project will utilize primary data attained using questionnaire from 1,309 beneficiaries registered to take part in the South Sudan Safety Net program throughout the Eight States of South Sudan as well as one Administrative Areas of South Sudan. Namely and in alphabetical order; Central Equatoria, Eastern Equatoria, Jonglei, Western Bahr el Ghazal Upper Nile, Warrap, Western Bahr el Ghazal and Western Equatoria being the Eight states while Greater Pibor Administrative Area serving as the only administrative area enrolled in the program

Table 3.1 Target Population

Target Location	Total Population	Percentage %
Central Equatoria	21,423	32.08
Eastern Equatoria	11,112	16.64
Jonglei	5,612	8.40
Northern Bahr el Ghazal	2	0.002995312
Upper Nile	5,938	8.89
Warrap	11,158	16.71
Western Bahr el Ghazal	5,942	8.90
Pibor	5,584	8.36
Total	**66,771**	**100**

Source: Author (2022)

3.5 Sampling and Sampling Procedure

Lameck (2013) presented that sampling design is defined as means of selecting primary unit for data collection and analysis which are appropriate for a specific research question. Lavrakas (2008) defines sample design as the framework or road map that serves as the basis for the selection of a survey sample and affects many other important aspects of a survey. Martinez-Mesa, Gonzalez-Chica, Bastos, Bonamigo and Duquia (2014) defines sample as a finite part or subset of participants drawn from the target population. Sequentially, the target population corresponds to the entire set of subjects whose characteristics are of interest to the research team. They further elaborated that sampling is the process through which individuals or sampling units are selected from the sample frame.

The study adopted stratified random sampling design implemented via weighted selection approach to enable achievement of proportionate balanced according to the numbers enrolled per the various States. Kombo and Tromps (2006) shades more- light that stratified random sampling design whereby the population is divided into homogenous sub groups and taking a simple random sample in each sub group. This sampling method will be best suited in this research because the population consists of different people with different economic, cultural, moral as well as academic background and status unified by the fact that they are beneficiaries

in the South Sudan safety net project and domiciled in Central Equatoria, Eastern Equatoria, Jonglei, Northern Bahr el Ghazal, Upper Nile, Warrap, Western Bahr el Ghazal, Western Equatoria and Greater Pibor Administrative Area. According to (Miaoulis and Michener, 1976) the level of precision, level of confidence or risk as well as degree of variability in the attributes being measured are key criterion for specification to determine appropriate sample size

Table 3.2 Sample Size

Target Location	Total Population	Percentage %	Target Population	Percentage %
Central Equatoria	21423	32.08	420	0.63
Eastern Equatoria	11112	16.64	218	0.33
Jonglei	5612	8.40	110	0.16
Northern Bahr el Ghazal	2	0.002995312	0	0.00
Upper Nile	5938	8.89	116	0.17
Warrap	11158	16.71	219	0.33
Western Bahr el Ghazal	5942	8.90	116	0.17
Pibor	5584	8.36	109	0.16
Total	**66771**	**100**	**1,309**	**1.96**

Source: Author (2022)

3.5 Research Instrument

This study will use structured or closed ended questionnaires as the main tool for collecting data given the nature of data to be collected, the time available and the objectives of the study (Oso and Onen, 2008). Thereafter, a sample of 1,309 from the entire population of 66,711 will be served with the questionnaire distributed to all the locations. The questionnaire will therefore be considered ideal for collecting data from all the locations within South Sudan Safety Net Project. The questionnaire will have categories which will include. Part A of the questionnaire seek general information on the respondents while parts B, C, D, E and F that will either be open and closed-ended questions that address the four research questions. A 5-point Likert scale will be used in the questionnaire, where 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree and 5=strongly agree in the efforts of reducing variation of the responses whilst enhance the quality of data.

As a matter of principle, the researcher has a noble obligation to ensure that the instrument chosen is valid and reliable whereby the validity and reliability of any research study depends to a large extent on the appropriateness of the instruments. Therefore, researcher will perform

a rehearsal on the questionnaires before the actual data collection is carried out. Pre-testing of questionnaire will be done on two respondents who will be not included in the final data collection.

3.6. Validity and Reliability of Research Instruments

If a researcher administers a test to a subject twice and gets the same score on the second administration as the first test, then there is reliability of the instrument. It is the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda and Mugenda, 1999), According to (Mugenda and Mugenda, 2003), pauses a question of whether or not an instrument is really measuring what it purports to be measuring. Pilot testing will be carried out to establish the content validity of the instrument. If there was an existence of an attribute then undertaking a test is acceptable in the efforts of measuring the attribute, they further argued that variation in the measurement is a product of variation in the attribute (Borsboom et al, 2004). The aforementioned speaks contrary to (Messick, 1989) who took a position that the extent to which the empirical evidences and theoretical rationales reinforce the satisfactoriness as well as appropriateness of interpretations and actions based on test scores.

3.7 Data Collection

This is the systematic and structured process of gathering and measuring information on targeted variables in an established and logical fashion, which then enables one to answer relevant questions and evaluate outcomes. The data collection component of research is common to all fields of study including physical and social sciences, humanities and business. While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains unchanged. The goal for all data collection is to acquire quality evidence that then translates to rich data analysis allowing the building of a convincing and credible answer to questions that have been posed. The accurate data collection will be very essential to maintaining the integrity of research in this study. Both the selection of appropriate data collection instruments and clearly delineated instructions for their correct use, reduce the likelihood of errors occurring which enhance collection of relevant data for analysis. Closed ended questionnaire will be served to the beneficiaries enrolled in the SSSNP in the various geographical locations.

3.8 Data Analysis and Presentation

Data Analysis method is the technique involving systematic application of statistical or logical procedures to describe and illustrate, condense and recap, and evaluate data. Microsoft excel and Stata Software shall be used as the data analytics tool. Mugenda and Mugenda (2003), emphasizes that the data must be cleaned, coded and properly analyzed in order to obtain a meaningful report. Therefore, it is critical to have the primary data reviewed for completeness and consistency upon which statistical analysis carry out. Descriptive statistics will be used to summarize the data. These include percentages and frequencies. Data will be presented in figures, pie charts and tables for easier interpretation using Microsoft excel application and STATA software. Descriptive statistics to be used include frequency distributions and measures of central tendency (mean and standard deviation). Inferential statistics will be used to examine the causal relationships between the predictor and the response variable. The analyzed data will be presented in the form of tabulations, percentages, mean and standard deviation.

3.8.1 Model

The study will utilize the below regression model;

$$\mathbf{Y = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \varepsilon_i}$$

Where: Y = Effective Beneficiary Payment

α =y regression intercept.

β_1 β_2 β_3 β_4 = Coefficients for the Model- independent variable

X_{1i} = Beneficiary Identification

X_{2i} = Naming Convention

X_{3i} = Payment to the illiterate

X_{4i} = Safeguards

ε =error term

3.9 Multiple Regression Assumptions Pretesting

Running of tests in respect to the final model involves checking the robustness of the diagnostic run. The tests help confirm that the assumptions of Ordinary Least Squares (OLS) are adhered to and not despoiled. According to Cooper and Schindler (2008) the OLS model is not supposed to violate linearity, autocorrelation and heteroscedsticity assumptions. Therefore, the study will incorporate multicollinearity test, normality test, autocorrelation test and heteroscedasticity tests.

Table 3.3: Diagnostic Test Summary

Assumption	Description	Test	Interpretation	Treatment
Normality	The test is done to establish normal distribution.	Shapiro–Wilk test	Variables are normally distributed if p values are greater than 0.05	Use of square roots or logs to address non-normality
Multicollinearity	Multicollinearity phenomenon is where correlation among variables results in standard errors distorting the regression analysis.	VIF Test	Multicollinearity exist where the VIF > 10	Eliminate highly correlated variables.
Heteroscedasticity	To establish if the variance of errors or the model is not the same for all observations.	Breusch–Pagan test	Heteroscedasticity exist where the p-value $p<0.05$)	Use Natural log of variables
Autocorrelation	To establish of values of the same variable is based on related objects.	Breusch-Godfrey test.	Autocorrelation exists if p-values are less than 0.05.	Hildreth-Lu Procedure

CHAPTER FOUR
DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

Chapter four was centred on the analysis, presentation of the gathered data and thereafter interpretation of the findings. The study looked into biometric technology utilization in respect effective payment exercise in the South Sudan Safety Net. This chapter was guided by the research objectives, which was to determine how biometric beneficiary identification technology, beneficiary naming convention, beneficiary illiteracy levels and safeguards affected the effectiveness of beneficiary payments in South Sudan Safety Net Projects. Close ended questionnaire was used for data gathering. Tools adopted for the study were descriptive statistics, diagnostic test by way of Skewness and Kurtosis for normality testing. Thereafter, tested for heteroskedasticity using the Breusch-pagan/ cook- Weisberg test for heteroskedasticity. Multi regression analysis used for model fitting.

4.2. Response rate and Descriptive Statistics

4.2.1 Response rate

The study managed to collect data from 1,309 respondents by means of a questionnaire distributed in proportionate stratified sampling method to the enrolled SSSNP beneficiaries across all the eight states and one administrative area. A total of 1,309 comprising of 100% targeted respondents graciously accepted to participate in the process by answering the questionnaire which was proportionately distributed based percentage weight for the enrolment per location in equal measure. Response rate above 69% is considered significant enough to generate precise results (Mugenda and Mugenda,2003)

Table 4.1 Response rate

Target Location	Target Population	Percentage %
Central Equatoria	421	32.16
Eastern Equatoria	218	16.65
Jonglei	110	8.40
Northern Bahr el Ghazal	0	0.00
Upper Nile	116	8.86
Warrap	219	16.73
Western Bahr el Ghazal	116	8.86
Pibor	109	8.33
Total	**1,309**	**100.00**

4.2.2 Descriptive Statistics of Study variable

The study made presentation information generated from excel and STATA software and comments from data analysis. Data collected using questionnaire built adopting the Five- point Likert scale with the range from 1- 5 where; 1=strongly disagree, 2=disagree, 3=Neutral, 4=agree and 5=strongly agree. The research obtained the mean (M) and Standard deviation (SD).

4.2.2.1 Biometric beneficiary Identification Technology

The first objective was to establish the effect of biometric beneficiary identification technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects. The study accessed the beneficiary identification using the questionnaire output.

Table 4.2 Biometric beneficiary Identification Technology Summary

```
. . summarize BBIT_1 BBIT_2 BBIT_3 BBIT_4 BBIT_5 BBIT_score
```

Variable	Obs	Mean	Std. Dev.	Min	Max
BBIT_1	1,309	4.847976	.3613041	3	5
BBIT_2	1,309	4.839572	.3671426	4	5
BBIT_3	1,309	4.832697	.375431	3	5
BBIT_4	1,309	4.833461	.3727065	4	5
BBIT_5	1,309	4.829641	.3760916	4	5
BBIT_score	1,309	4.836669	.3525355	3.8	5

BBIT_score

	Percentiles	Smallest		
1%	4	3.8		
5%	4	3.8		
10%	4	4	Obs	1,309
25%	5	4	Sum of Wgt.	1,309
50%	5		Mean	4.836669
		Largest	Std. Dev.	.3525355
75%	5	5		
90%	5	5	Variance	.1242813
95%	5	5	Skewness	-1.846646
99%	5	5	Kurtosis	4.551893

The below is the questionnaire output.

Table 4.3 Biometric beneficiary Identification Technology

Beneficiary Identification	Variable	|	Obs	Mean	Std. Dev	Min	Max
Biometric technology enhances and assures positive identification of every individual beneficiary	BBIT_1	|	1,309	4.847976	0.3613041	3	5
Biometric technology enhances due diligence on the beneficiaries where additional proof is needed	BBIT_2	|	1,309	4.839572	0.3671426	4	5
Biometric Technology increases the end to end efficiency of the payment process	BBIT_3	|	1,309	4.832697	0.375431	3	5
Biometric Technology will help reduce possible beneficiary verification and validation miss-match	BBIT_4	|	1,309	4.833461	0.3727065	4	5
Biometric Technology the assurance in confirming that the beneficiary purported to have been paid received funds	BBIT_5	|	1,309	4.829641	0.3760916	4	5

Guided by the results in Table 4.2 and 4.2.2 above, the respondents gave a very strong position in favour of biometrics technology helping with identification of beneficiaries. Implying that there was a challenge resonating around positive verification. Mean of 4.836669 and a standard deviation of 0.3525355 solidified the position.

4.2.2.2 Biometric naming convention authentication Technology

The second objective was to assess the effect of biometric naming convention authentication technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.

Table 4.4 Biometric Naming Convention Authentication Technology Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
BNC_1	1,309	4.825821	.3794081	4	5
BNC_2	1,309	4.833461	.3727065	4	5
BNC_3	1,309	4.833461	.3727065	4	5
BNC_4	1,309	4.834225	.372021	4	5
BNC_5	1,309	4.838044	.368551	4	5
BNC_score	1,309	4.833002	.3466907	4	5

BNC_score

Percentiles		Smallest		
1%	4	4		
5%	4	4		
10%	4	4	Obs	1,309
25%	5	4	Sum of Wgt.	1,309
50%	5		Mean	4.833002
		Largest	Std. Dev.	.3466907
75%	5	5		
90%	5	5	Variance	.1201944
95%	5	5	Skewness	-1.82036
99%	5	5	Kurtosis	4.526834

The below is the questionnaire output.

Table 4.5 Biometric Naming Convention Technology

Naming Convention	Variable	|	Obs	Mean	Std. Dev	Min	Max
Biometric technology will help in eliminate instances of erroneous payment to a beneficiary with similar names	BNC_1	|	1,309	4.825821	0.3794081	4	5
Biometric Technology ensures payment is made to the intended beneficiary	BNC_2	|	1,309	4.833461	0.3727065	4	5
Biometric Technology ensures that specific beneficiary with similar names as another are served with ease	BNC_3	|	1,309	4.833461	0.3727065	4	5
Biometric technology helps in easier differentiation of beneficiaries.	BNC_4	|	1,309	4.834225	0.372021	4	5
Biometric technology will help provide quality assurance in efficient payment exercise where names are a close match	BNC_5	|	1,309	4.838044	0.368551	4	5

Table 4.3.1 and 4.3.2 above, the respondents gave a very strong position in favour of biometrics technology addressing naming convention authentication where beneficiaries share two or three names in the same order. This implied that they were cognizant of the cultural practice where a number of beneficiaries within the same state were likely to share all the names used in the enrollment.

4.2.2.3 Biometric payment to the illiterate Technology

The third objective was to evaluate the effect of biometric payment to the illiterate technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.

Table 4.6 Biometric payment to the illiterate technology Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
BTSP_1	1,309	4.786096	.5069147	2	5
BTSP_2	1,309	4.831933	.3740689	4	5
BTSP_3	1,309	4.752483	.5718982	2	5
BTSP_4	1,309	4.83728	.3692507	4	5
BTSP_5	1,309	4.834225	.372021	4	5
BTSP_score	1,309	4.813089	.370841	3.333333	5

BTSP_score

Percentiles		Smallest		
1%	4	3.333333		
5%	4	3.5		
10%	4	3.666667	Obs	1,309
25%	5	3.666667	Sum of Wgt.	1,309
50%	5		Mean	4.813089
		Largest	Std. Dev.	.370841
75%	5	5		
90%	5	5	Variance	.1375231
95%	5	5	Skewness	-1.707878
99%	5	5	Kurtosis	4.233725

The below is the questionnaire output.

Table 4.7 biometric payment to the illiterate technology

illiterate beneficiaries	Variable	Obs	Mean	Std. Dev	Min	Max
Biometric technology helps in eliminating unnecessary paper work required of the beneficiaries before and after the disbursement of funds	BTSP_1	1,309	4.786096	0.5069147	2	5
Biometric technology helps bridge the lack of education to efficiently serve the beneficiaries	BTSP_2	1,309	4.831933	0.3740689	4	5
Biometric technology helps provide the beneficiaries with some level of comfort on the integrity of the payment exercise	BTSP_3	1,309	4.752483	0.5718982	2	5
Biometric technology helps to simplify the payment process	BTSP_4	1,309	4.83728	0.3692507	4	5
Biometric technology helps leveling the environment to suite both literate and illiterate	BTSP_5	1,309	4.834225	0.372021	4	5
Biometric technology helps in covering the stigma and shame for illiterate beneficiary during the payment process	BTSP_6	1,309	4.836516	0.3699476	4	5

Table 4.4.1 and 4.4.2 above, the respondents gave a somewhat moderate position in that they were not agreeable that biometrics will eliminate paper work neither will it bridge the gap instigated by being educated or lack thereof.

4.2.2.4 Biometric SafeguardsTechnology

The final objective was to establish the effect of biometric safeguards technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.

Table 4.8 biometric safeguards technology Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
BFP_1	1,309	4.835752	.3706416	4	5
BFP_2	1,309	4.838044	.368551	4	5
BFP_3	1,309	4.830405	.3754201	4	5
BFP_4	1,309	4.825821	.3794081	4	5
BFP_5	1,309	4.834225	.372021	4	5
BFP_6	1,309	4.831169	.3747459	4	5
BFP_score	1,309	4.832569	.3407051	4	5

BFP_score

	Percentiles	Smallest		
1%	4	4		
5%	4	4		
10%	4	4	Obs	1,309
25%	4.833333	4	Sum of Wgt.	1,309
50%	5		Mean	4.832569
		Largest	Std. Dev.	.3407051
75%	5	5		
90%	5	5	Variance	.1160799
95%	5	5	Skewness	-1.857286
99%	5	5	Kurtosis	4.697516

The below is the questionnaire output.

Table 4.9 biometric safeguards technology

Safe Guards	Variable	|	Obs	Mean	Std. Dev	Min	Max
Biometric technology helps eliminate identity and frustrate fraud	BFP_1	|	1,309	4.835752	0.3706416	4	5
Biometric technology helps eliminate instances of double payment to the same beneficiary	BFP_2	|	1,309	4.838044	0.368551	4	5
Biometric technology helps eliminate/ reduce/ frustrate/ arrest payment process corruption attempts	BFP_3	|	1,309	4.830405	0.3754201	4	5
Biometric technology helps eliminate/ reduce instances of illegitimate non- receipt claims	BFP_4	|	1,309	4.825821	0.3794081	4	5
Biometric technology helps improve the integrity of the payment process	BFP_5	|	1,309	4.834225	0.372021	4	5
Biometric technology helps in keeping away illegitimate beneficiaries	BFP_6	|	1,309	4.831169	0.3747459	4	5

Table 4.4.1 and 4.4.2 above, the respondents gave a somewhat constant position of agreement in that they were agreeable that biometrics will help provide some protection but did not give the required confidence of strong agreement, this implies that there was more to be done in addition to employing biometrics technology.

The outcome of the above responses means that the respondents were of the opinion that the biometric technological input in the payment process was likely to assist in achieving a more favorable beneficiary identification process. The same responses were echoed on all the other three independent variables where the respondents failed to reject the null hypothesis that biometric naming convention technology had no effect on the efficiency of beneficiary payments exercise, illiteracy levels had no effect on the efficiency of beneficiary payments exercise as well as failing to reject the null hypothesis that biometric safeguards had no effect on the efficiency of beneficiary payments exercise.

4.3 Demographic Information

The study looked into personal information of the respondents in addition to the independent variables of the study. The data collected full names, whether or not they had any form legal

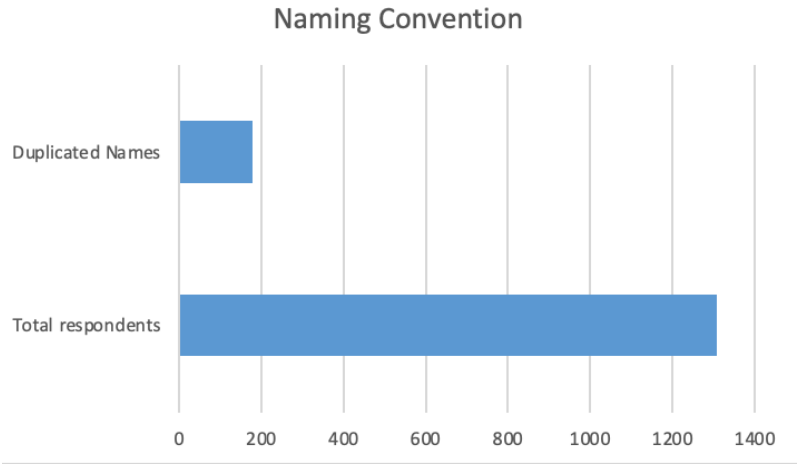
identification document in their possession. The documents included the Jinsia also known as the Payam letter issued by the local administration to identify the native, national identity card, passport as well as those who had no legal document of any form. The gender, the marital status, marriage arrangement, family size, age, the highest level of education and employment status for all the respondents who participated.

4.3.1 Naming convention similarities

The respondents' possible duplication in quotes was an interesting 13.67%. This is to mean that out of every hundred about 12 to 14 respondents shared all the three names and in the same order where the first name, middle name as well as the surname are an exact match.

Table 4.10 Naming convention similarities

	Number	Percentage
Total respondents	1309	100
Duplicated Names	179	13.67

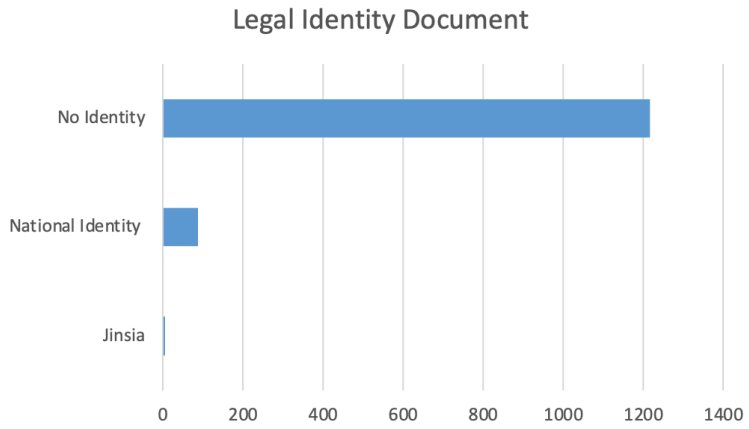


4.3.2 Identification Document

An alarming 92% on the respondents did not possess any for of identification document either by design or by default where a total number of 1,216 respondents claimed not to have any form of identification and only ninety- three respondents were in a possession of identification and provided the identification numbers.

Table 4.11 Identity document possession

identification_document	Freq.	Percent	Cum.
jinsia	5	0.38	0.38
national identity	88	6.72	7.10
no document	1,216	92.90	100.00
Total	1,309	100.00	



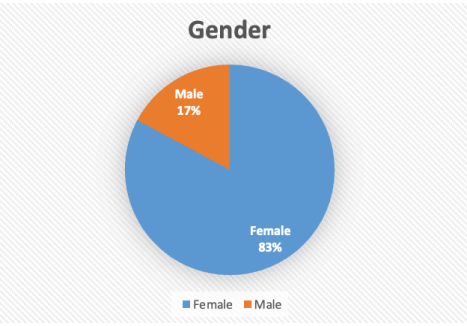
4.3.3 Gender

The gender distribution was skewed towards the female gender where only 17.19% were male while the biggest respondents forming 82.81% were female. This resonates well as compared to the total number of all the beneficiary enrolment in the sssnp where over 52,000 out of the 66.771 were female.

Table 4.12 : Gender

gender	Freq.	Percent	Cum.
Female	1,084	82.81	82.81
Male	225	17.19	100.00
Total	1,309	100.00	

Graph 1. Gender



4.3.4 Marital Status

Respondents by marital status indicated that 63% were in a marriage arrangement. A divorce rate of 3.36% being the lowest status captured in the research. Single and the respondents who have lost their loved one stood at 13.67% and 19.79 respectively

Table 4:13 Respondents by Marital status

marital_status	Freq.	Percent	Cum.
divorced	44	3.36	3.36
married	827	63.18	66.54
single	179	13.67	80.21
widow/widower	259	19.79	100.00
Total	1,309	100.00	

4.3.5 Married arrangement

The research sort to appreciate the factor revolving monogamy versus polygamy arrangements. One of the main factors where one of the independent variable sprouts from. Monogamous marriages commanded 49.66% which translated to half of the respondents.

Table 4.14 Married arrangement

marriage_agreement	Freq.	Percent	Cum.
N/A	179	13.67	13.67
monogamous	650	49.66	63.33
polygamous	480	36.67	100.00
Total	1,309	100.00	

4.3.6 Family Size (members)

Respondents' distribution by Family size showed that most families had between 5- 10 members with only 1 family that had over 20 family members. Families below 5 people formed 26.66%. Swimmingly this could mean that big families are reducing commonality amongst African cultures where huge families were the norm across board.

Table 4.15 Family Size

family_size(members)	Freq.	Percent	Cum.
below 5	349	26.66	26.66
between 11 - 20	93	7.10	33.77
between 5 - 10	866	66.16	99.92
over 20	1	0.08	100.00
Total	1,309	100.00	

4.3.7 Age bracket grouping

The study was able to capture 63.48% being below for years of age with the rest being 41 years and above. Some beneficiaries were below the age of 18 but happen to be the head of the household due to several factors that the lead to having no adult in the household or an adult that is either absent or incapacitated.

Table 4.16 Age bracket grouping

age_group	Freq.	Percent	Cum.
18-30yrs	469	35.83	35.83
31-40yrs	362	27.65	63.48
41-50yrs	240	18.33	81.82
above 50yrs	226	17.27	99.08
below 18yrs	12	0.92	100.00
Total	1,309	100.00	

4.3.8 Highest Education certification Attained

The respondents who attained primary education as the highest level and the respondents with no education at all accounted for 89% of the respondents

Table 4.17 Highest Education certification

highest_level_of_education	Freq.	Percent	Cum.
Diploma	3	0.23	0.23
Drop out of school	22	1.68	1.91
No Education	569	43.47	45.38
primary certificate	605	46.22	91.60
secondary certificate	110	8.40	100.00
Total	1,309	100.00	

4.3.9 Employment status

The self- employed and the unemployed reflected 23.61 and 68.53 respectively. Only 1.30% of the respondents had a fulltime job. This in some way satisfied the sssnp mission of reaching out to the poor and to the vulnerable

Table 4.18 Respondents by employment status

employment_status	Freq.	Percent	Cum.
Employed full time	17	1.30	1.30
Employed part time	86	6.57	7.87
Self employed	309	23.61	31.47
Unemployed	897	68.53	100.00
Total	1,309	100.00	

4.4 Study Variables

The study explored how independent variables Biometric beneficiary identity, Biometric Naming Convention Technology, Biometric technology supporting Payment to the illiterate and Biometrics Safeguards would impact a better payment exercise. The outcome from the questionnaire presented the following arguments; -

First independent variable, biometric beneficiary identity technology is likely to enhances and assures efforts of positive identification of every individual beneficiary. This then upgrades the due diligence on the beneficiaries where additional proof is needed. This then translates to positive matching of beneficiary against the payment schedule since the process with significantly reduce the common mismatches that succeed during verification and validation. The technology then provides the assurance to confirming that the beneficiary purported to have been paid received funds

Table 4.19 Biometric beneficiary identity

Variable	Obs	Mean	Std. Dev.	Min	Max
BBIT_1	1,309	4.847976	.3613041	3	5
BBIT_2	1,309	4.839572	.3671426	4	5
BBIT_3	1,309	4.832697	.375431	3	5
BBIT_4	1,309	4.833461	.3727065	4	5
BBIT_5	1,309	4.829641	.3760916	4	5

Second independent variable- Naming Convention may look a simple matter but carries heavy weight in an environment where several people in the same region possess similar names in the same order from first name to the surname. Biometric technology comes in to eliminate instances of erroneous payment to a beneficiary with similar names either by error or by design. The technological input then will differentiate such parties using their biodata thus presetting the assurance that payment is made to the intended beneficiary be it the names are similar to the surname or just two names. This bestows the stakeholders involved in the payment with light weight when comes to ascertaining the legitimate beneficiary.

Table 4.20 Biometrics Naming Convention

Variable	Obs	Mean	Std. Dev.	Min	Max
BNC_1	1,309	4.825821	.3794081	4	5
BNC_2	1,309	4.833461	.3727065	4	5
BNC_3	1,309	4.833461	.3727065	4	5
BNC_4	1,309	4.834225	.372021	4	5
BNC_5	1,309	4.838044	.368551	4	5

Third independent variable, Biometric technology supporting payment to illiterate beneficiaries by circumnavigating the headache of paper work where the recipients are expected to fill forms and sign before they can be paid. Noting that this is an uphill task for anyone with little or no education thus the technology plugs in to bridge the lack of education to efficiently dispense funds to the recipients to whom funds are due. This the presents recipients with some balanced level of comfort of the integrity of the process since they face limitation of reading and writing making the process simpler and eventually leveling the environment to suite both literate and illiterate which demystifies the stigma and shame for illiterate beneficiary during the payment process

Table 4.21 Biometric technology supporting Payment to the illiterate

Variable	Obs	Mean	Std. Dev.	Min	Max
BTSP_1	1,309	4.786096	.5069147	2	5
BTSP_2	1,309	4.831933	.3740689	4	5
BTSP_3	1,309	4.752483	.5718982	2	5
BTSP_4	1,309	4.83728	.3692507	4	5
BTSP_5	1,309	4.834225	.372021	4	5

The fourth independent variable, Safeguards plays a very fundamental role of frustrate identity fraud by being able to differentiate beneficiaries using their biodata. The technology also aids

in the elimination of instances where an individual receives double payment. Limiting any unjust enrichment effort by eliminating, reducing, frustrating and arresting illegal practice like corrupt efforts to reward undeserving recipients thus improving the integrity of the payment process by keeping illegitimate beneficiaries at bay.

Table 4.22 Biometrics Safeguards

Variable	Obs	Mean	Std. Dev.	Min	Max
BFP_1	1,309	4.835752	.3706416	4	5
BFP_2	1,309	4.838044	.368551	4	5
BFP_3	1,309	4.830405	.3754201	4	5
BFP_4	1,309	4.825821	.3794081	4	5
BFP_5	1,309	4.834225	.372021	4	5

The dependent variable, efficient beneficiary payment process assumes the role of positive identification or recognition using physiological or behavioral characteristics of the beneficiaries. This sieves out to get rid of the hull from the wheat thus leaving the legitimate. The separation process then assists in ascertaining that the actual beneficiary was present at the payment center whilst dealing the impersonation factor. In addition, the technology provides not only support to the illiterate but also assist all others from the pain of conventional authentication by use of pins, signatures, passwords and ink finger print captured on paper.

Table 4.23: Efficient of Beneficiary Payments

Variable	Obs	Mean	Std. Dev.	Min	Max
BFM_1	1,309	4.831169	.3747459	4	5
BFM_2	1,309	4.834225	.372021	4	5
BFM_3	1,309	4.825057	.3820696	3	5
BFM_4	1,309	4.832697	.3733891	4	5
BFM_5	1,309	4.826585	.382766	3	5
BFM_6	1,309	4.826585	.3787502	4	5

The Independent variable is EBP score (Efficiency Biometric Payment – which is considered to be a summation of the dependent variables obtained as an average score of the responses to the categorical variables from the questionnaire. In addition, an average the score obtained on the Biometric Technology supporting payment to illiterate beneficiaries, Biometric Fraud Prevention on the efficiency of the Beneficiary payments and Biometric Fraud Mitigation variables that had 6 questions each and respondents had to provide their score of 1– 5 (based on the Likert scale). Once we have the 5 variables averaged then went ahead now to create a summation of the EBP score as our dependent variable.

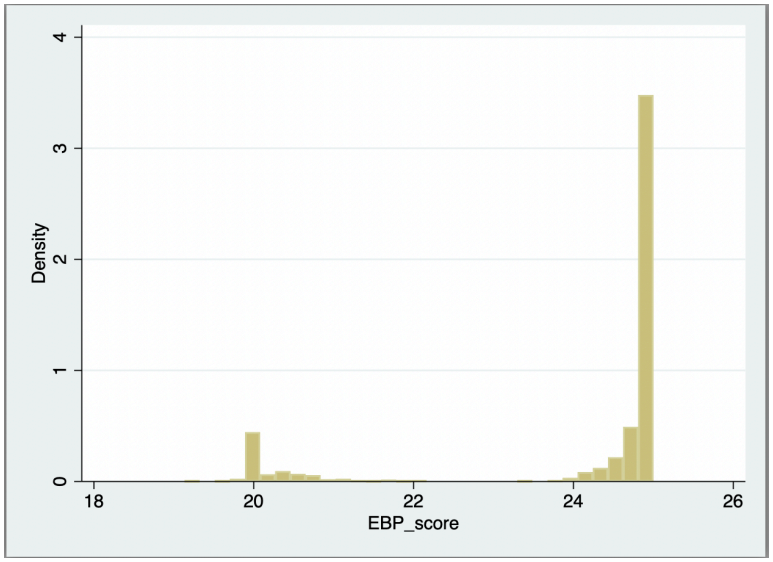
4.5 Diagnostic Tests

4.5.1 Normality test

Testing for normality is done in two primary ways Graphs and normality test.

The assumption is that the dependent variable is normally distributed. To confirm the assumption or violation thereof

Graph 2: Skewness and kurtosis normality tests




```
. histogram EBP_score
(bin=31, start=19.133333, width=.18924732)
```

The test for distribution indicated that the response parted from the normal distribution curve. Indicating that the respondents took a skewed position that presented strong significance for y on X_1, X_2 X_3 and X_4

Table 4.24 Summary Statistics

```
. . sum pred_EBP_score, detail

                        Fitted values
-------------------------------------------------------------
      Percentiles      Smallest
 1%           20       19.13333
 5%           20       19.53333
10%         20.2       19.83333       Obs                1,309
25%     24.63333       19.83333       Sum of Wgt.        1,309

50%           25                      Mean            24.14472
                       Largest        Std. Dev.       1.709604
75%           25            25
90%           25            25       Variance        2.922744
95%           25            25       Skewness       -1.845391
99%           25            25       Kurtosis        4.547661
```

The details are able to give additional information; mean, variance, skewness and kurtosis

Table 4.25 SK Test Statistics- Skewness/ Kurtosis tests

SK Test formal for skewness and kurtosis

```
. . sktest pred_EBP_score

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+---------------------------------------------------------------------
pred_EBP_s~e |      1,309     0.0000        0.0000           .          0.0000
```

Additional formal test that gave us the P- Value for skewness and

They are less than <0.5 thus reject the null hypothesis that assumes that the distribution is normal and adopt the alternative hypothesis that our distribution is skewed and exhibits kurtosis. Skewness possessing negative value. Total observations of 1,309 and the probability of Pr(Skewness) implies is symmetrical in nature with the p-value of skewness being 0.0000. Similarly, Pr(Kurtosis) signifies that kurtosis is also symmetrically distributed (p-value of kurtosis being 0.0000). The skewness coefficients of Biometric beneficiary identification, naming convention, illiteracy and safeguards all indicating (0.000) for all the independent variables possessing no skewed position for normal distribution depicted by the coefficients falling at zero.

4.5.2 Test for Normality; Shapiro- Wilk W Test

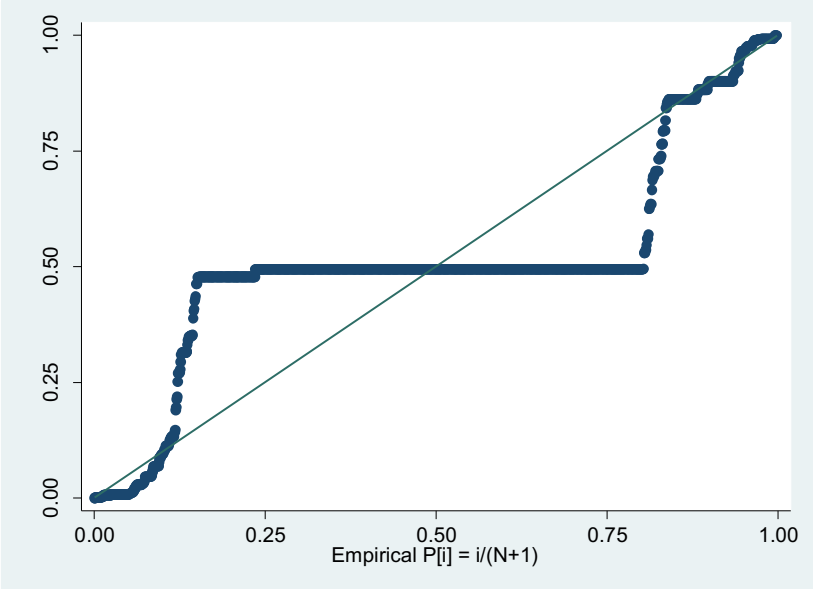
This means that the residuals in the model are random or normally distributed

Table 4.26 Shapiro-Wilk W test

>5 implies data is normally distributed

```
.  . swilk BBIT_score BNC_score BTSP_score BFP_score BFM_score EBP_score

                    Shapiro-Wilk W test for normal data

    Variable |        Obs       W           V         z       Prob>z
-------------+--------------------------------------------------------
  BBIT_score |      1,309    0.92293     62.123    10.336    0.00000
   BNC_score |      1,309    0.91258     70.468    10.652    0.00000
 BTSP_score |      1,309    0.91443     68.977    10.598    0.00000
   BFP_score |      1,309    0.86846    106.035    11.674    0.00000
   BFM_score |      1,309    0.87012    104.698    11.643    0.00000
   EBP_score |      1,309    0.69604    245.025    13.771    0.00000
```

Graph 3 Distribution Graph



The closer the data points tare to the line, the normal the data distribution. This is not the case for our data. The researcher opted to standardize the values by natural logs to try and fit the model.

Normality of residuals:

Graph 4 Residual Inverse normal

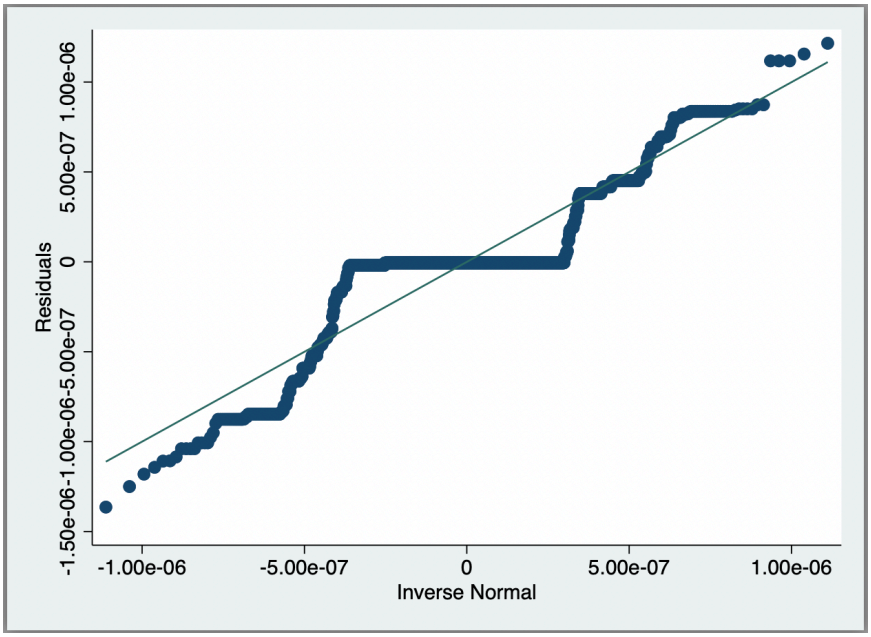


Table 5 residuals

Residuals

	Percentiles	Smallest		
1%	-1.01e-06	-1.36e-06		
5%	-8.47e-07	-1.25e-06		
10%	-4.61e-07	-1.18e-06	Obs	1,309
25%	-5.69e-09	-1.14e-06	Sum of Wgt.	1,309
50%	-5.69e-09		Mean	2.00e-15
		Largest	Std. Dev.	3.51e-07
75%	-5.69e-09	1.12e-06		
90%	4.51e-07	1.12e-06	Variance	1.23e-13
95%	6.39e-07	1.16e-06	Skewness	-.3842458
99%	8.37e-07	1.22e-06	Kurtosis	5.148388

The Skewness and Kurtosis values indicate the data is not normally distributed an indication of one- sided skewed position

4.5.3 Correlation matrix

The need to appreciate the strength and the nature of relationship between the variables is captured using correlation where coefficient values fall between +1 to -1. When the indication falls closer to +1, translates to high positive correlation between the variables while in the converse low correlation.

Table 4.28 Correlation

	EBP_sc~g	BBIT_s~g	BNC_sc~g	BTSP_s~g	BFP_sc~g	BFM_sc~g
EBP_score_~g	1.0000					
BBIT_score~g	0.9838	1.0000				
BNC_score_~g	0.9748	0.9610	1.0000			
BTSP_score~g	0.9700	0.9421	0.9402	1.0000		
BFP_score_~g	0.9726	0.9454	0.9211	0.9224	1.0000	
BFM_score_~g	0.9763	0.9503	0.9323	0.9251	0.9550	1.0000

The results showed (0.9838, 0.9610, 0.9402, 0.9224 and 0.9550) for Beneficiary identification. Naming convention was (0.9748, 0.9421, 0.9211 and 0.9251). Illiteracy (0.9700, 00.9454 and 0.9323). Fraud prevention (0.9726 and 0.9503) translating to strong relationship of all the variables. Implication showing high level of relationship effects.

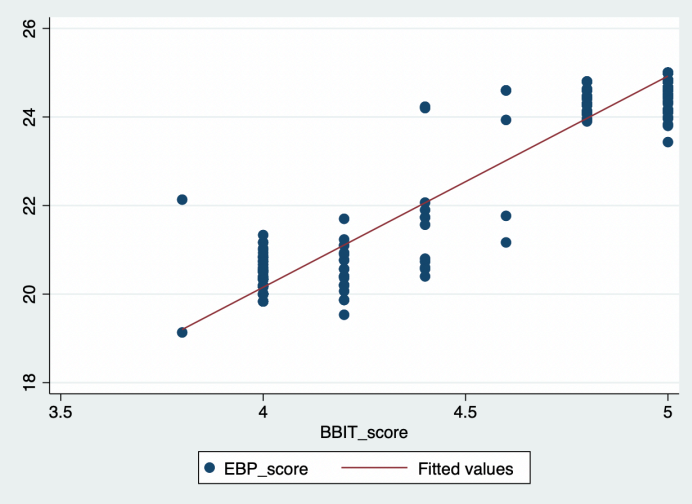
4.5.4 Linearity Test

Assumptions that there is no multicollinearity, the independent variables are not highly correlated. Variance inflation factor for the independent variables VIF of <5 is favorable.

```
. . vif

    Variable |       VIF       1/VIF
-------------+----------------------
BBIT_score~g |     21.29    0.046976
BFM_score_~g |     15.61    0.064046
BNC_score_~g |     15.50    0.064531
BFP_score_~g |     14.06    0.071114
BTSP_score~g |     11.22    0.089152
-------------+----------------------
    Mean VIF |     15.54
```

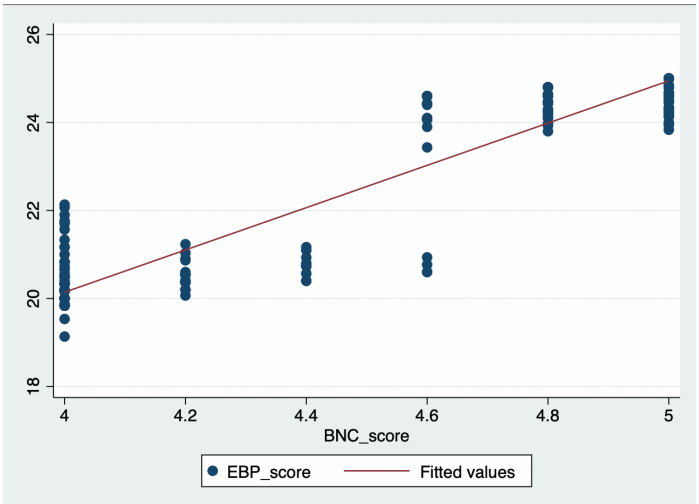
The results indicated presence of multi collinearity as the values were >5.

Graph 6 Beneficiary Identification

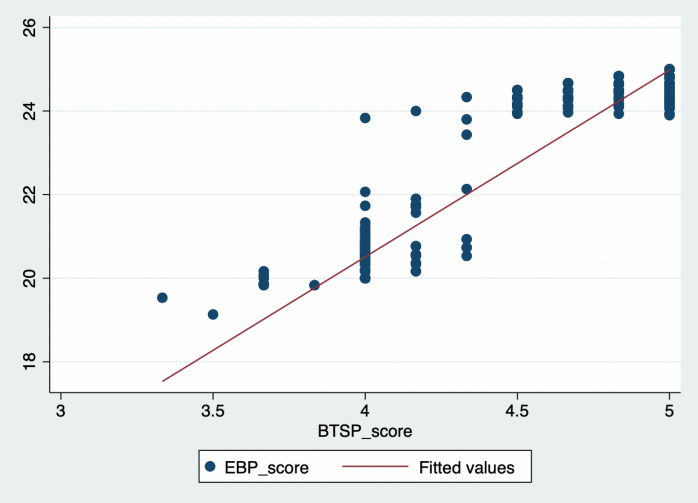


Indication of linear relationship

Graph 7 Naming Convention on the efficiency of beneficiary payments

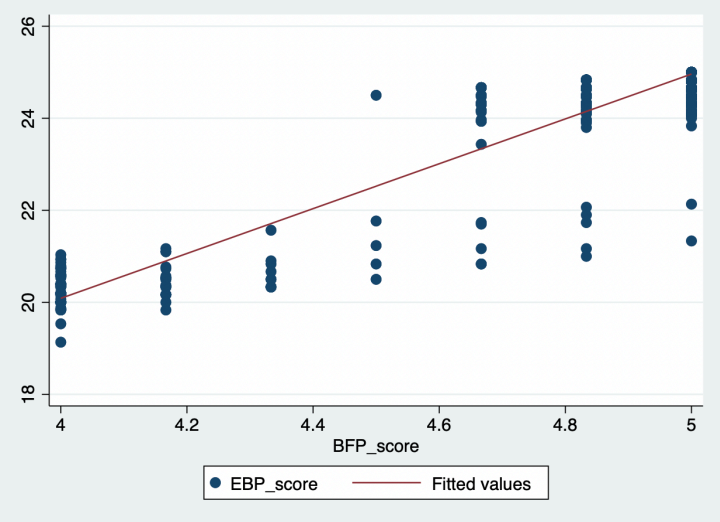


Graph 8 Payment to the illiteracy on the efficiency of beneficiary payments

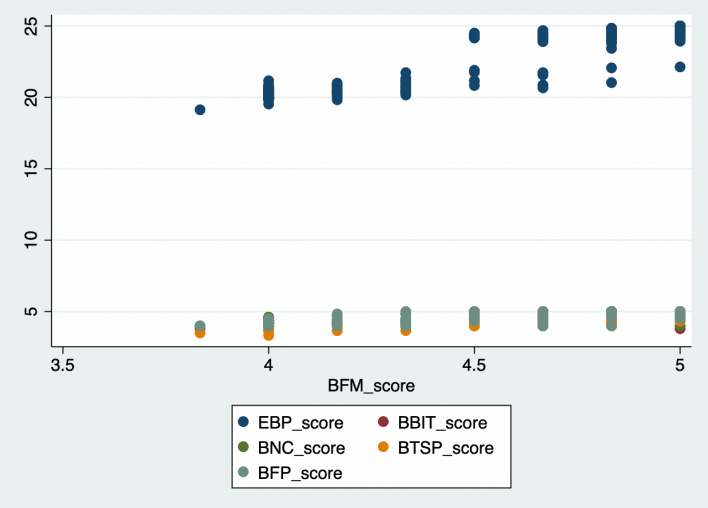


Graph 9 Safeguards

Safeguards on the efficiency of beneficiary payments



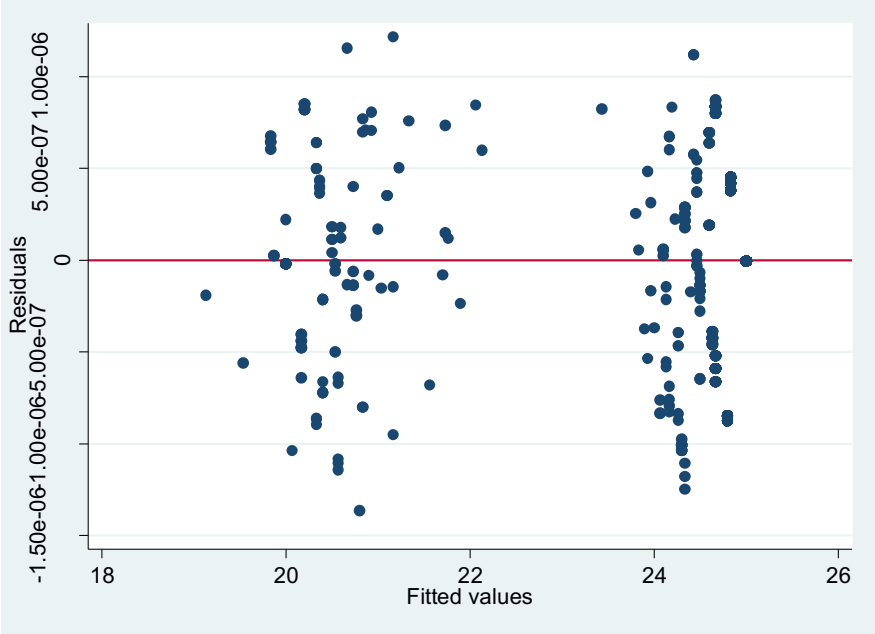
Graph 10 Scatter output for regression



4.5.5 Homoscedasticity Test

One of the classical linear regression assumptions, Homoscedasticity assumption hypothesizes remaining of the same in respect to the error term probability distribution for all the observations. This is to mean that similarity in results for variance of each error term of the independent variable. The flip is that if the error term does not produce the same variance the error term probability distribution will be referred to as heteroscedasticity (Bedru & Seid, 2005).

Graph 11 Test for heteroscedasticity;



4.5.6 Breusch-Pagan Test

The test is to help establish presence of heteroscedasticity

Table 4.29 Breusch-Pagan Test

```
. . hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of EBP_score

         chi2(1)      =    44.57
         Prob > chi2  =   0.0000
```

From the above test we reject the null hypothesis of constant variance in our dataset because our p-value is less than 0.05. It implies our data is affected by heteroscedasticity.

This necessitates us to use natural logs to smoothen the values.

Table 4.30 Cronbach's alpha test

Cronbach's alpha test

```
Test scale = mean(unstandardized items)

Average interitem covariance:     .0058326
Number of items in the scale:            5
Scale reliability coefficient:      0.9904
```

4.6. Exploratory Factor Analysis

4.6.1 Factor test: Bartlett test of sphericity and Kaiser - Meyer- Olkin measures of Sampling adequacy

The study additionally applied exploratory factor analysis so as to reduce the number of factors in relation to beneficiary identification, naming convention, payment to the illiterate as well as safeguards in determining if the scale represents one unitary constrain or are there other underline dimension other than efficiency beneficiary payments. On the assumptions that they are correlated.

Correlated all the variables to generate correlation matrix to be able to uniquely contribute to explaining the matrix thus need to test for adequate correlation thus utilize Kaiser- Meyer-Olkin measures of Sampling adequacy

Table 4.31: Efficient of Beneficiary Payments

```
. . factortest BBIT_score BNC_score BTSP_score BFP_score BFM_score

Determinant of the correlation matrix
Det               =     0.000


Bartlett test of sphericity

Chi-square        =         12884.409
Degrees of freedom =               10
p-value           =             0.000
H0: variables are not intercorrelated


Kaiser-Meyer-Olkin Measure of Sampling Adequacy
KMO               =     0.912
```

The test generated the determinant of 0.000 and value for Bartlett test of sphericity where the P- Value needs to be significant. The implication is that we get to find out that they are correlated enough to merit running of factor analysis. The Kaiser- Meyer- Olkin measures of Sampling adequacy need to be at 0.5 and above to help indicate how well the analysis will work especially on overlaps. The higher the value the more fulfilling in terms of the desired outcome. Significant P- Value and Kaiser- Meyer- Olkin of more than 0.5 will now lead to factor analysis

4.6.2 Factor Analysis

Assumption that the variables are correlated by generation of a matrix
The output of principle factor analysis.
Sampling adequacy need to be at 0.5 and above to help indicate how well the analysis will work especially on overlaps. The higher the value the more fulfilling in terms of the desired outcome

Table 4.32: Factor Analysis/ Correlation Output

Factor analysis/correlation — Number of obs = 1,309
Method: principal-component factors — Retained factors = 1
Rotation: (unrotated) — Number of params = 28

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	22.54530	21.85592	0.8052	0.8052
Factor2	0.68939	0.14624	0.0246	0.8298
Factor3	0.54315	0.11236	0.0194	0.8492
Factor4	0.43079	0.07148	0.0154	0.8646
Factor5	0.35931	0.07744	0.0128	0.8774
Factor6	0.28187	0.00763	0.0101	0.8875
Factor7	0.27424	0.02858	0.0098	0.8973
Factor8	0.24566	0.00409	0.0088	0.9061
Factor9	0.24157	0.01399	0.0086	0.9147
Factor10	0.22758	0.02144	0.0081	0.9228
Factor11	0.20614	0.01699	0.0074	0.9302
Factor12	0.18915	0.00827	0.0068	0.9369
Factor13	0.18089	0.01442	0.0065	0.9434
Factor14	0.16647	0.01272	0.0059	0.9493
Factor15	0.15375	0.00816	0.0055	0.9548
Factor16	0.14559	0.00489	0.0052	0.9600
Factor17	0.14070	0.00242	0.0050	0.9651
Factor18	0.13828	0.00686	0.0049	0.9700
Factor19	0.13142	0.01192	0.0047	0.9747
Factor20	0.11950	0.00474	0.0043	0.9790
Factor21	0.11476	0.01331	0.0041	0.9831
Factor22	0.10145	0.00932	0.0036	0.9867
Factor23	0.09212	0.00946	0.0033	0.9900
Factor24	0.08266	0.01473	0.0030	0.9929
Factor25	0.06794	0.01284	0.0024	0.9953
Factor26	0.05509	0.00703	0.0020	0.9973
Factor27	0.04806	0.02089	0.0017	0.9990
Factor28	0.02717	.	0.0010	1.0000

LR test: independent vs. saturated: chi2(378) = 6.1e+04 Prob>chi2 = 0.0000

Principle component factor for 1,309 number of observations

Proportion of variance that the eigen values explain on the 1,309. First factor explains 80.52% with Eigen values landing and not crossing the 1.0000 (100%), this being the unique contribution. The Stata has identified and retained all the 28 factors. The quality of each item will need rotation to enable interpretability.

Table 4.33: Factor Analysis/ Correlation Loading

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Uniqueness
BBIT_1	**0.9527**	**0.0923**
BBIT_2	**0.9584**	**0.0815**
BBIT_3	**0.9418**	**0.1131**
BBIT_4	**0.9130**	**0.1665**
BBIT_5	**0.9151**	**0.1625**
BNC_1	**0.8447**	**0.2864**
BNC_2	**0.9120**	**0.1682**
BNC_3	**0.9207**	**0.1522**
BNC_4	**0.8910**	**0.2061**
BNC_5	**0.9556**	**0.0868**
BTSP_1	**0.7572**	**0.4266**
BTSP_2	**0.9198**	**0.1540**
BTSP_3	**0.6025**	**0.6370**
BTSP_4	**0.9748**	**0.0498**
BTSP_5	**0.9659**	**0.0671**
BTSP_6	**0.9554**	**0.0872**
BFP_1	**0.9272**	**0.1403**
BFP_2	**0.8811**	**0.2236**
BFP_3	**0.8713**	**0.2409**
BFP_4	**0.9064**	**0.1785**
BFP_5	**0.8866**	**0.2139**
BFP_6	**0.8585**	**0.2629**
BFM_1	**0.9266**	**0.1414**
BFM_2	**0.8302**	**0.3107**
BFM_3	**0.8731**	**0.2376**
BFM_4	**0.8873**	**0.2127**
BFM_5	**0.9153**	**0.1623**
BFM_6	**0.8985**	**0.1926**

The study went further to Rotate

```
. rotate

Factor analysis/correlation                    Number of obs    =      1,309
    Method: principal-component factors        Retained factors =          1
    Rotation: orthogonal varimax (Kaiser off)  Number of params =         28
```

Factor	Variance	Difference	Proportion	Cumulative
Factor1	**22.54530**	.	**0.8052**	**0.8052**

LR test: independent vs. saturated: chi2(**378**) = **6.1e+04** Prob>chi2 = **0.0000**

Patterns and Uniqueness variance indicating a position of 80.52% on the orthogonal varimax factor analysis

Rotated factor loading

Table 4.34: Factor Analysis/ Correlation Rotation

```
. . sortl

Rotated factor loadings (pattern matrix) and unique variances sorted
```

Variable	Factor1	Uniqueness
BTSP_4	0.9748	0.0498
BTSP_5	0.9659	0.0671
BBIT_2	0.9584	0.0815
BNC_5	0.9556	0.0868
BTSP_6	0.9554	0.0872
BBIT_1	0.9527	0.0923
BBIT_3	0.9418	0.1131
BFP_1	0.9272	0.1403
BFM_1	0.9266	0.1414
BNC_3	0.9207	0.1522
BTSP_2	0.9198	0.1540
BFM_5	0.9153	0.1623
BBIT_5	0.9151	0.1625
BBIT_4	0.9130	0.1665
BNC_2	0.9120	0.1682
BFP_4	0.9064	0.1785
BFM_6	0.8985	0.1926
BNC_4	0.8910	0.2061
BFM_4	0.8873	0.2127
BFP_5	0.8866	0.2139
BFP_2	0.8811	0.2236
BFM_3	0.8731	0.2376
BFP_3	0.8713	0.2409
BFP_6	0.8585	0.2629
BNC_1	0.8447	0.2864
BFM_2	0.8302	0.3107
BTSP_1	0.7572	0.4266
BTSP_3	0.6025	0.6370

According to (Stevens, 2012) 0.200 units difference between factor loading for them to be unique. 0.4 is significant for interpretation of underlying dimension. Calculating the internal consistency reliability or coefficient alpha

Table 4.35 Cronbach's alpha test

```
Test scale = mean(unstandardized items)

Average interitem covariance:     .1153362
Number of items in the scale:           27
Scale reliability coefficient:      0.9887
```

Reliability coefficient Alpha for the entire scale is 0.9887, this is good we would wish to have a reliability to be at least 0.80
Factor rotation interpretation with the questionnaire to see the internally consistent scale is measuring. How the items that make the factor consistently measure the construct.

Table 4. 36: Factor loading

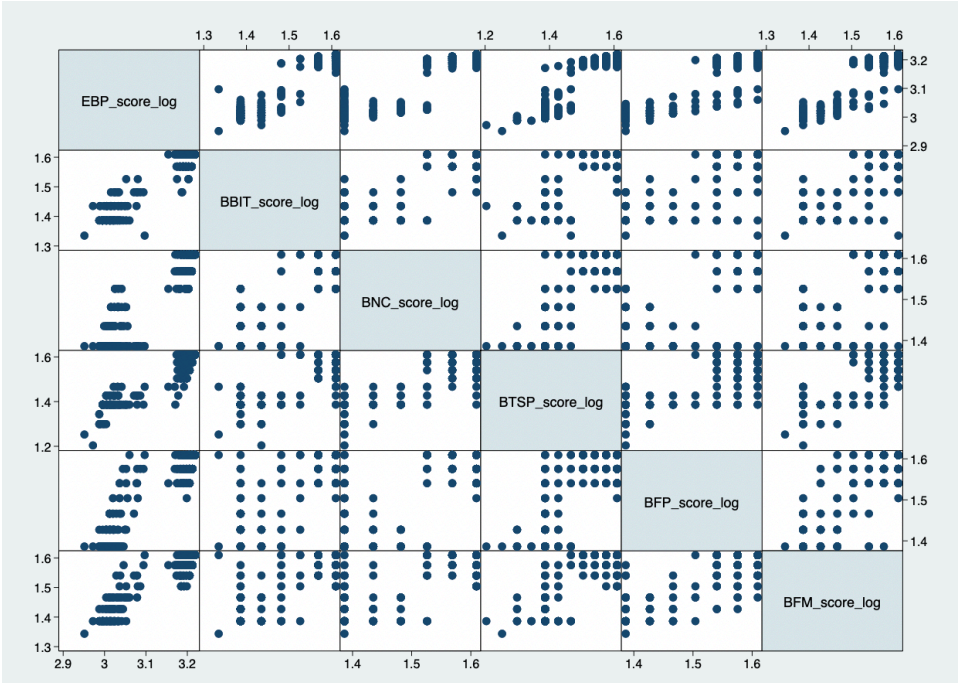
N/S	Variable	Factor1	Uniqueness	Question
1	BTSP_4	0.9748	0.0498	Biometric technology helps to simplify the payment process
2	BTSP_5	0.9659	0.0671	Biometric technology helps leveling the environment to suite both literate and illiterate
3	BBIT_2	0.9584	0.0815	Biometric technology enhances due diligence on the beneficiaries where additional proof is needed
4	BNC_5	0.9556	0.0868	Biometric technology will help provide quality assurance in efficient payment exercise where names are a close match
5	BTSP_6	0.9554	0.0872	Biometric technology helps in covering the stigma and shame for illiterate beneficiary during the payment process
6	BBIT_1	0.9527	0.0923	Biometric technology enhances and assures positive identification of every individual beneficiary
7	BBIT_3	0.9418	0.1131	Biometric Technology increases the end-to-end efficiency of the payment process
8	BFP_1	0.9272	0.1403	Biometric technology helps eliminate identity and frustrate fraud
9	BFM_1	0.9266	0.1414	Biometric technology help in identification or recognition using physiological or behavioural characteristics of the beneficiaries
10	BNC_3	0.9207	0.1522	Biometric Technology ensures that specific beneficiary with similar names as another are served with ease
11	BTSP_2	0.9198	0.154	Biometric technology helps bridge the lack of education to efficiently serve the beneficiaries
12	BFM_5	0.9153	0.1623	Biometric technology helps provide alternative to conventional authentication e.g. passwords, pin codes, signatures and ink finger print captured on paper
13	BBIT_5	0.9151	0.1625	Biometric Technology the assurance in confirming that the beneficiary purported to have been paid received funds
14	BBIT_4	0.913	0.1665	Biometric Technology will help reduce possible beneficiary verification and validation miss-match
15	BNC_2	0.912	0.1682	Biometric Technology ensures payment is made to the intended beneficiary
16	BFP_4	0.9064	0.1785	Biometric technology helps eliminate/ reduce instances of illegitimate non- receipt claims

17	BFM_6	0.8985	0.1926	Biometric technology eliminate/ reduce fraud opportunities against legit beneficiaries
18	BNC_4	0.891	0.2061	Biometric technology helps in easier differentiation of beneficiaries.
19	BFM_4	0.8873	0.2127	Biometric technology helps eliminate/ reduce impersonation of beneficiaries
20	BFP_5	0.8866	0.2139	Biometric technology helps improve the integrity of the payment process
21	BFP_2	0.8811	0.2236	Biometric technology helps eliminate instances of double payment to the same beneficiary
22	BFM_3	0.8731	0.2376	Biometric technology helps ascertain that the actual beneficiary was present at the payment center
23	BFP_3	0.8713	0.2409	Biometric technology helps eliminate/ reduce/ frustrate/ arrest payment process corruption attempts
24	BFP_6	0.8585	0.2629	Biometric technology helps in keeping away illegitimate beneficiaries
25	BNC_1	0.8447	0.2864	Biometric technology will help in eliminate instances of erroneous payment to a beneficiary with similar names
26	BFM_2	0.8302	0.3107	Biometric technology helps in authentication of legit beneficiary
27	BTSP_1	0.7572	0.4266	Biometric technology helps in eliminating unnecessary paper work required of the beneficiaries before and after the disbursement of funds
28	BTSP_3	0.6025	0.637	Biometric technology helps provide the beneficiaries with some level of comfort on the integrity of the payment exercise

4.7 Model Fitting

Assumption in regression analysis is that variables in the analysis is linear related. The study utilized scatter plot to verify

Graph 12. Linear Scatter Plot



Presence of low motivation scores of the dependent variable compared aligned with low motivation score for the independent variable which the graduate in symmetry to association with high scores. The illiteracy variable presented the outlier in that it was either the respondent is educated or not being the base.

Table 4.37: Correlation Relationship

```
. pwcorr EBP_score BBIT_score_log BNC_score_log BTSP_score_log BFP_score_log BFM_score_log

             | EBP_sc~e BBIT_s~g BNC_sc~g BTSP_s~g BFP_sc~g BFM_sc~g
-------------+------------------------------------------------------
   EBP_score |   1.0000
BBIT_score~g |   0.9836   1.0000
BNC_score_~g |   0.9748   0.9610   1.0000
BTSP_score~g |   0.9710   0.9421   0.9402   1.0000
BFP_score_~g |   0.9718   0.9454   0.9211   0.9224   1.0000
BFM_score_~g |   0.9758   0.9503   0.9323   0.9251   0.9550   1.0000
```

There is very strong relationship amongst all the variables of over 0.9. This concludes that there is a linear relationship between the dependent variable- efficient beneficiary payment and the independent variables- beneficiary identification, naming convention, payment to the illiterate and safeguards.

4.7.1 The regression output from the data analysis.

Table 4.38: Regression Analysis

```
. regress EBP_score BBIT_score BNC_score BTSP_score BFP_score BFM_score

      Source |       SS           df       MS      Number of obs   =     1,309
-------------+----------------------------------   F(5, 1303)      >  99999.00
       Model |  3822.9494            5  764.589879   Prob > F        =   0.0000
    Residual |  1.6084e-10       1,303  1.2344e-13   R-squared       =   1.0000
-------------+----------------------------------   Adj R-squared   =   1.0000
       Total |  3822.9494        1,308  2.92274419   Root MSE        =   3.5e-07

------------------------------------------------------------------------------
   EBP_score |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 BBIT_score |           1   1.26e-07  7.9e+06   0.000            1    1.000001
  BNC_score |    1.000001   1.09e-07  9.2e+06   0.000            1    1.000001
BTSP_score |    .9999997   8.62e-08  1.2e+07   0.000     .9999995    .9999998
 BFP_score |    .9999999   1.05e-07  9.6e+06   0.000     .9999997           1
 BFM_score |    .9999995   1.09e-07  9.2e+06   0.000     .9999992    .9999997
     _cons |   7.40e-08   1.42e-07     0.52   0.602    -2.04e-07    3.52e-07
------------------------------------------------------------------------------
```

The model sum of squares of 3822.9494 explained variance of the efficient beneficiary payment with unexplained Residuals of 1.6084. The R- Squared of 1.0000, suggesting that the

100% of the variability in efficient beneficiary payment explained by the linear combination of these independent variables that are resonating the same. They all significantly contribute

4.7.2. Standardized data coefficient

The study further to standardize data coefficient in order to perform comparison of the different independent variables

Table 4.39: Regression Analysis- Standardized data coefficient

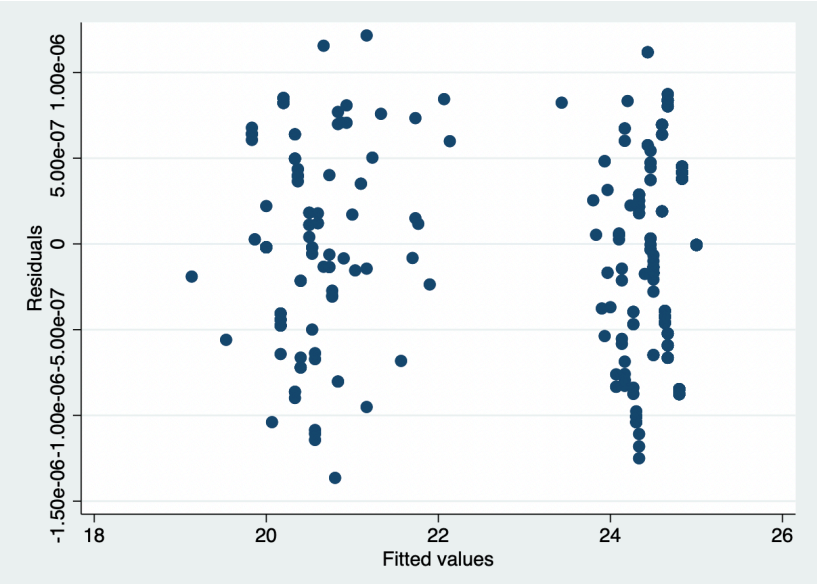
```
. regress EBP_score BBIT_score BNC_score BTSP_score BFP_score BFM_score, beta

      Source |       SS           df       MS      Number of obs   =     1,309
-------------+----------------------------------   F(5, 1303)      >  99999.00
       Model |  3822.9494            5  764.589879   Prob > F        =    0.0000
    Residual |  1.6084e-10       1,303  1.2344e-13   R-squared       =    1.0000
-------------+----------------------------------   Adj R-squared   =    1.0000
       Total |  3822.9494        1,308  2.92274419   Root MSE        =   3.5e-07

------------------------------------------------------------------------------
   EBP_score |      Coef.   Std. Err.      t    P>|t|                     Beta
-------------+----------------------------------------------------------------
 BBIT_score |           1   1.26e-07  7.9e+06   0.000                 .206209
  BNC_score |    1.000001   1.09e-07  9.2e+06   0.000                .2027902
BTSP_score |    .9999997   8.62e-08  1.2e+07   0.000                .2169163
  BFP_score |    .9999999   1.05e-07  9.6e+06   0.000                .1992889
  BFM_score |    .9999995   1.09e-07  9.2e+06   0.000                .2006386
      _cons |   7.40e-08   1.42e-07     0.52   0.602                       .
------------------------------------------------------------------------------
```

The output showed that the independent variables were closely knit with payment to the illiterate possessing the highest coefficient followed beneficiary identification, naming convention and safeguards in that order.

4.7.3. Regression Diagnostics

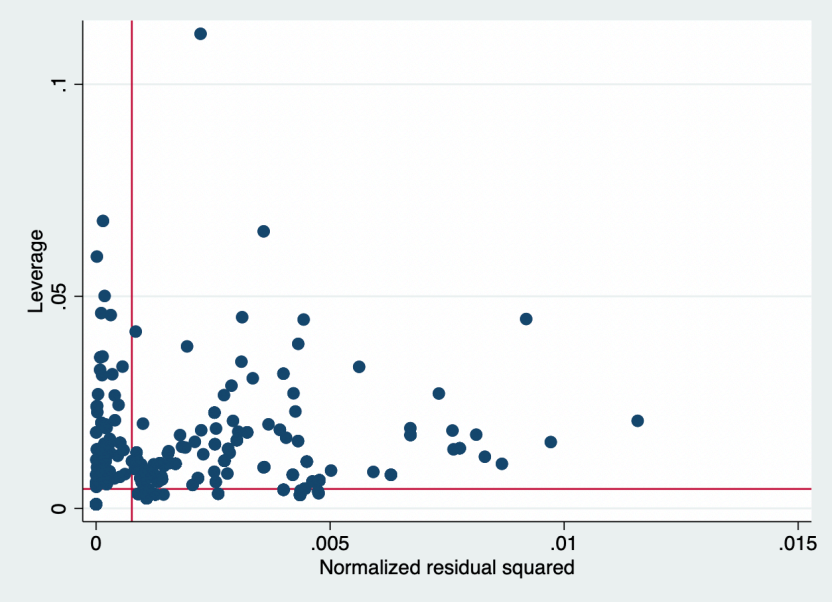
Assumption that the Residual are random

Graph 13. Residual



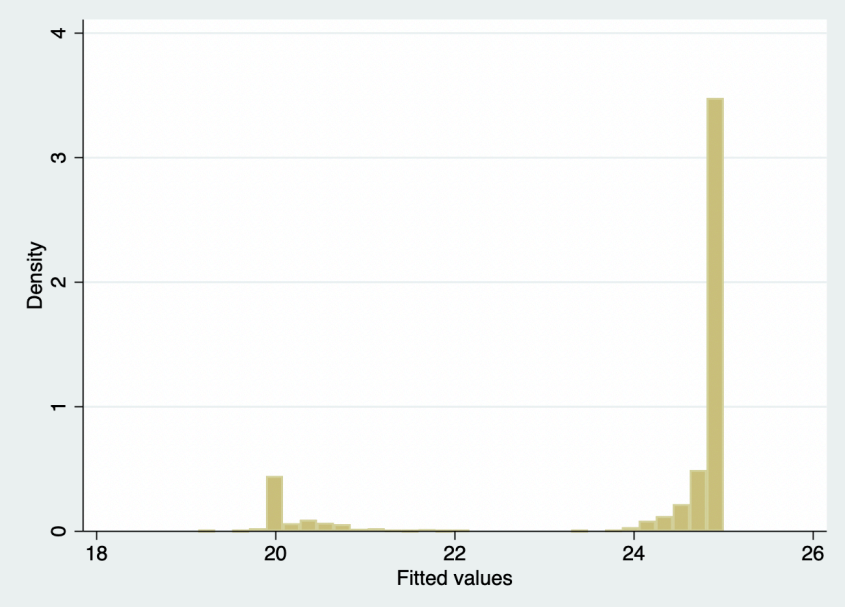
The different between the actual value in the data set and the predicted value based on the independent presents a pattern of highly relation.

Graph 14. Postestimation



The study performed postestimation to assist on the Residual

Graph 15. Residual



The fitted values showed that the residuals were not fairly normal.

Table 4.28: regression output

```
. regress EBP_score_log BBIT_score_log BNC_score_log BTSP_score_log BFP_score_log BFM_score_log, beta
```

Source	SS	df	MS	Number of obs	=	1,309
				F(5, 1303)	>	99999.00
Model	7.56544503	5	1.51308901	Prob > F	=	0.0000
Residual	.000131238	1,303	1.0072e-07	R-squared	=	1.0000
				Adj R-squared	=	1.0000
Total	7.56557627	1,308	.00578408	Root MSE	=	.00032

EBP_score_log	Coef.	Std. Err.	t	P>|t|	Beta
BBIT_score_log	.1969691	.0005159	381.78	0.000	.2032397
BNC_score_log	.2013141	.0004482	449.12	0.000	.2039944
BTSP_score_log	.1920898	.0003546	541.78	0.000	.2093622
BFP_score_log	.205916	.0004344	474.07	0.000	.2051151
BFM_score_log	.2028585	.0004546	446.22	0.000	.2034402
_cons	1.610899	.0001878	8576.50	0.000	.

The P- Value of 0.00001

R- Square 1.000 which is the proportionate variation and the dependent variable accounted for by the predictors of the infinite variables and the models. Meaning 100% of the achievement. Testing the Null Hypothesis that Biometrics does not affect efficient beneficiary payment. The adjustment on the predictor and the sample size also gave 1.0000 position being the computational adjustment.

Mean square of the regression to the residual of 99999.0.

Tested the statistical significance by forming a ratio of the regression coefficient to the standard error to achieve the [t] value, which was recorded as 0.0000 on all regressions for two- tailed t- test thus setting of Alpha at 0.5 threshold presents for Null hypothesis rejection.

$$\mathbf{Y = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \varepsilon_i}$$

Where: Y = Effective Beneficiary Payment

α =y regression intercept.

β_1 β_2 β_3 β_4 = Coefficients for the Model- independent variable

X_{1i} = Beneficiary Identification

X_{2i} = Naming Convention

X_{3i} = Payment to the illiterate

X_{4i} = Safeguards

ε =error term

Y = 0.1969691BBIT + 0 .2013141BNC + 0 .1920898BTSP + 0 .205916 + 0 .2028585BFM + 1.610899

Overall fit of the model is significant. This is then followed by a look into if there is a collinearity problem. The coefficients being below 0.5 provides the indication of the prediction. The results indicated that the four independent variables were significant to the efficiency of beneficiary payments. The output of the regression summary indicated that the fitted model Y = 0.1969691BBIT + 0 .2013141BNC + 0 .1920898BTSP + 0 .205916 + 0 .2028585BFM + 1.610899 presented significance.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The fifth chapter is the amalgamation of the whole study, containing a summary and discussion of the findings made, in relation to the study objectives, the conclusions arrived at based on the findings and recommendations proposal.

5.2 Summary

The study findings are summarized based on the research objectives, which were; - to establish the effect of biometric beneficiary identification technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects; To assess the effect of biometric naming convention authentication technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects; To evaluate the effect of biometric payment to the illiterate technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects; To establish the effect of biometric safeguards technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.

5.2.1 Findings on biometric beneficiary identification technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects indicated that that identification of beneficiaries was an uphill task since 92.90% of the respondents did not possess legal identity card. Thus, a solution of biometrics nature was needed to address the identity crisis. The respondents agreed that the technological input would help resolve safety net payment process especially where documents may be lacking due to whichever reason. In such a case adoption of recognition based on physiological or behavioural characteristics of mortal creation will suffice (Wencheng et al, 2019).

5.2.2 Findings of biometric naming convention authentication technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects shade light on the cultural practice in respect to naming where about 13% of beneficiaries shared similar names with one or more of the beneficiaries. Some cultures adopted naming conventions where a child was named according to a sequence where all first born were called Jada, second Swaka, third- Wani and fourth Pitia amongst the Baari speakers. The Dinka's named their children with the name or characteristics of cattle followed by their father, grandfather and great grandfather's name.

Since the society is highly polygamous, a number of children from different mothers were likely to share all the names since its similar lineage united by the father (Sawe, 2017). Therefore, biometrics technology was an added advantage to single out the beneficiaries possessing this uniformity.

5.2.3 Findings of biometric payment to the illiterate technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects showed that the literacy levels were indeed low as per various local and international output. The study captured 43.47% of the respondents to not having education at all. This means that 4 out of every 10 people was likely to have no formal education. This is a big problem and must be approached form numerous angles to address the bigger picture of alleviating poverty and vulnerability amongst the masses. Expecting the illiterate to cram and memorize password especially passwords with complex policy will most definitely be a challenge to less learned individuals.

5.2.4 Findings of biometric safeguards technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects resonated with other endeavors that involve cash assistance where stakeholders attracted by the fraud triangle finds it enticing whereby they are presented that pressure or motive to commit fraudulent, perceived opportunity and rationalization are the core and fundamental elements that fuel the act of fraud (Cressey, 1953). Opportunity is presented when identification, verification, validation, culture and literacy levels works against the conventional payment disbursement practices in favour of a criminal

5.3 Conclusions

The study reviewed the effect of biometric technology on the efficiency of beneficiary payments and arrived at a position that, the technology has significant effect on the efficiency of the process. It was very clear from majority of the respondents that they were of the opinion that the technological input be included in the payment process to eliminate the aforementioned challenges they face during cash transfer. The cash transfer of all nature required that the beneficiaries possess some form of identification for duty of care purposes before payments are made, unfortunately running by the outcome of this study (92.90%) of the beneficiaries did not have any form of identification. This is a real issue that if left unaddressed during payments will throw fundamental elements into disarray. The use of biometrics as mode of identification presents exceptional recompences. It takes identification a notch higher whereby in addition to human beings, biometrics authenticates magnetic ID, stripe and smart cards. In addition to

eased the burden of remembering passwords and PINs thus considered user friendly, holds higher accuracy and reliability (Podio & Dunn, 2001). A position seconded by (Ogbanufe & Kim, 2018) biometrics authentication is more expedient and swift mode of authentication.

Secondly, the naming convention culture being practiced is deeply rooted in the different ethnic groups and is not going away soon thus a need to circumnavigate this challenge when making payments by introducing a measure that will single out a beneficiary who possesses similar names and in the same order, where the first name, middle name and surname are the same. A time has come when there is a necessary requirement for advanced safe haven in authentication emanating from identity and authenticity that has evolved with the ages (Harris & Yen, 2002)

The continent is yet to hit the comfort zone in terms of literacy levels and sub-Saharan Africa tailing the globe. This was revealed by the respondents where 89.69% of the respondents had only the primary education or no education at all. This is alarming from every angle since we are in a time where the world has gone digital and highly technological. Technological advancement foes hand in hand with literacy thus an option that would bridge the two is highly welcomed to help attain a fair renumeration process. Biometrics technology erases the fear of forgetting keys and passwords (Vacca, 2007)

Safeguards is an essential and central component of any form of payment process. The need to ring fence in a way that it will lock out the individuals seeking to realize unjust enrichment through impersonification, corruption, cheating the process or outright felony to lay hands on the spoils. The primary advantages of biometrics are to provide enhanced safeguard whilst simplifying and expediting the user substantiation and certification (Mahier et al., 2009).

5.4 Recommendations

Adoption of biometrics technology in all payment processes with help resolve the challenges around identification, verification and fraud mitigation whilst allowing the natives to continue with the cultural practices like naming convention.

Guided by the overwhelming consideration by the respondents in favour of adopting biometrics technology, the country should consider adopting biometric system database by first merging the existing databases, followed by a clean- up then roll out registration of the remaining eligible beneficiaries to smoothen the identification and payment process in addition to dealing the deduplication factor thus achieving the synchronized and unified static and biodata of the masses.

Consider civil education to the beneficiaries to boost the literacy levels and enhance quality assurance of the payment exercise.

Registration of Persons- Government with the help of Local Authorities and if need be, get support International and National Non- Governmental Agencies to roll out registration of persons and award National Identification card after performing census to ascertain population.

Adult education either through formal curriculum or community- based support to be rolled out to enlighten the masses in the efforts of reducing illiteracy to an acceptable or to the current international levels.

Fortify the selection criterion of the beneficiaries identified and enrolled in the South Sudan Safety Net projects to mitigate fraud attempts using other orthodox means guided by the fact that Biometrics will have sealed out the other traditional means of fraud thus undeserving recipients may try to beat the process through falsification that they are indeed vulnerable and in dire need of assistance

5.5 Recommendations for Future Research

Future researchers to explore looking into most effective biometrics technology mode that would best suit the payment process by exploring the various factors and specific biometrics options. This is to mean making consideration that would lead to choosing iris scanning over finger print or facial recognition over palm scan whilst cognizant of other elements like cloud or blade server infrastructure, costs, interoperability and logistics involved in the technological implementation. The study should also consider running checks for deduplication to ensure that the beneficiaries do not register multiple times using alias pegged on the fact that most beneficiaries in remote locations do not possess identification documents.

REFERENCES

Abayomi, S., Olukayode, & Abayomi, S., Olukayode (2016). Personal Ethics and Fraudster Motivation: The Missing Link in Fraud Triangle and Fraud Diamond Theories. *International Journal of Academic Research in Business and Social Sciences*, *6*(2). https://doi.org/10.6007/ijarbss/v6-i2/2020

Abdullahi, R. and Mansor, N (2015a). *Concomitant Debacle of Fraud Incidences in the Nigeria Public Sector: Understanding the Power of Fraud Triangle Theory*. International Journal of Academic Research in Business and Social Sciences, Vol. 5, No. 5, pp, 312-326.

Aceto, M (2002). *Ethnic personal names and multiple identities in Anglophone Caribbean speech communities in Latin America*. Language in Society, 31: 577–608

Acosta, P.; Endo, I., Garcia, G. L., Jose, A., de Guzman, A. and Okamura, Y (2019). *Making Payments More Efficient for the Philippines Conditional Cash Transfer Program*. World Bank Social Protection Policy Note,no. 20;. World Bank, Washington, DC. https://openknowledge.worldbank.org/handle/10986/32540 License: CC BY 3.0 IGO.

Ahmed, W. A., Shokai, S. A., Abduelkhair, I. H., and Boshra, A. Y. (2015) *Factors Affecting Utilization of Family Planning Services in a Post-Conflict Setting, South Sudan*: A Qualitative Study 2(4):655-666.
doi: 10.3934/publichealth.2015.4.655.

Albrecht, W. S., Albrecht, C. C., Albrecht, C. O. and Zimbelman, M. F (2009). *Fraud Examination*. Natorp Boulevard, USA: South-western Cengage Learning.

Albrecht, C., Turnbull, C., Zhang, Y. and Skousen, C. J (2010). *The relationship between South Korean Chaebols and Fraud*. Management Research Review, 33 (3), 257- 268.

Alderman, H (2014) What are Social Safety Nets, What do they Achieve and Where do they fit into Competing Demand on a Government's Finances. Nairobi.

Ayer, A. J. (1936). *Language, Truth, and Logic*. New York, Dover

Barrientos, A. and D. Hulme (2008). *Social Protection for the Poor and Poorest in Developing Countries*: Reflections on a Quiet Revolution, BWPI Working Paper 30, Brooks World Poverty Institute, University of Manchester, Manchester.

Bastagli, F (2011). Conditional Cash Transfers as a Tool of Social Policy. Economic and Political Weekly, 46(21), 61–66. http://www.jstor.org/stable/23017227

Bedru & Seid (2005) Econometrics. A teaching Material for Distance Students majoring in Economics (Mekelle University)

Bhattacharyya1, D., Ranjan, R., Alisherov F.A., and Choi, M (2009). *Biometric Authentication: A Review*; International Journal of u- and e- Service, Science and Technology Vol. 2, No. 3.

Borsboom, D., Mellenbergh, G. J., & van Heerden, J (2004). The Concept of Validity. *Psychological Review*, *111*(4), 1061–1071. https://doi.org/10.1037/0033-295x.111.4.1061

Boslaugh, S (2007). *Secondary data sources for public health:* A practical guide. New York, NY: Cambridge.

Braun, D (2006). Names and Natural Kind Terms. Ernest Lepore and Barry Smith (eds.), *Handbook of Philosophy of Language*, OxfordUniversity Press.

Brown, R (2000). Social identity theory: past achievements, current problems and future challenges. *European Journal of Social Psychology*, *30*(6), 745–778. https://doi.org/3.0.co;2-o">10.1002/1099-0992(200011/12)30:6<745

Burke, P. J. and Stets J. E (2009) *Identity Theory*. Oxford University Press. Inc, New York ISBN9780195388275

Burton, J W (1992). *Dinka.* Encyclopedia of World Cultures. Boston: G. K. Hall,

Carnap, R (1928). *Der logische Aufbau der Welt*, Berlin: Bernary; R.A. George (trans.), *The Logical Structure of the World*, Berkeley: University of California Press, 1967.

Carmona, M. S (2019) *Biometric technology and beneficiary rights in social protection programmes*
https://www.unrefugees.org/news/south-sudan-refugee-crisis-explained/

Clark, A. G. J (2013) Identification for Development: The Biometrics Revolution. Center for Global Development Working Paper No. 315,
SSRN: https://ssrn.com/abstract=2226594. http://dx.doi.org/10.2139/ssrn.2226594

Cochran, W. G (1977). *Sampling techniques*. 3rd ed. New York: John Wiley and Sons

Cooper, D. R., and Schindler, P. S (2003). Business research methods. 8th ed. Boston, Mass.: McGraw-Hill/Irwin

Cressey, D. R (1953). *Other People's Money*. Montclair, NJ: Patterson Smith, pp.1-300.

De Silva, P. O (2019). *Study of Fraud Prevention and Detection Techniques in Commercial Banks in Sri Lanka*. 5th International Conference for Accounting Researchers and Educators

Dev, S. M., Subbarao, K., Galab, S., Ravi, C (2007) *Safety Net Programmes: Outreach and Effectiveness*. Economic and Political Weekly Vol. 42, No. 35 pp. 3555-3565. Economic and Political Weekly.

Dion, K. L (1983). *Names, identity, and self.* Names, 31(4): 245–256

Donnellan, M. B., & Lucas, R. E (2013). *Secondary data analysis*. In T. D. Little (Ed.), The Oxford handbook of quantitative methods: Statistical analysis (pp. 665–667). Oxford University Press.

Dr.Aranuwa, Felix and Ogunniye, Gideon (2012). *Enhanced Biometric Authentication System for Efficient and Reliable e-Payment System in Nigeria*. International Journal of Applied Information Systems. 4. 56-61. 10.5120/ijais12-450676.

Duke II, J. and Kankpang, K. A (2012) *Effect of Fraud Risk Reduction Strategy on the Level of Employee Fraud in Nigerian Public Service Organizations*: Problems of Management in the 21st Century. University of Calabar, Calabar, Nigeria

Elmi, O. H. & Minja, D (2019). Effects of hunger safety net program on livelihood improvement in Wajir County, Kenya. International Academic Journal of Law and Society, 1(2), 435-449

Elmusharaf, k. Byrne, E. and O'Donovan, D. (2017). *Social and traditional practices and their implications for family planning*: a participatory ethnographic study in Renk, South Sudan
doi: 10.1186/s12978-016-0273-2

Etikan I and Bala K (2017) Sampling and sampling methods. *Biom Biostat Int* J;5(6):215-217. DOI: 10.15406/bbij.2017.05.00149

Fabry, M (2016). Now You Know: Why Do We Have Middle Names?

Farik, Mohammed and Lal, Nilesh and Prasad, Shalendra (2016). *A Review Of Authentication Methods. International Journal of Scientific and Technology Research.* 5. 246-249.

Frahm, O (2012) *Defining the Nation: National Identity in South Sudanese Media Discourse.* Africa Spectrum Vol. 47, No. 1 (2012), pp. 21-49 (29 pages) Sage Publications, Ltd.

Finch, F. J (1937). *Bari child naming*. Sudan Notes and Records, Vol. 20, pp 166- 168. University of Khartoum

Gao, Q (2012). *Using IP addresses as assisting tools to identify collusions*. International Journal of Business, Humanities and Technology, 2(1), 70-75.

Garg, R. K. and Garg, N. K. Garg, (2015) "Developing secured biometric payments model using Tokenization," *International Conference on Soft Computing Techniques and Implementations (ICSCTI)*, 2015, pp. 110-112,

doi: 10.1109/ICSCTI.2015.7489549.

Gatakaa, S. E (2010) The Relationship Between Personal Financial Literacy and Lending by Commercial Banks in Kenya. Nairobi.

Gebresilassie, Y. H (2013). Graduation Determinants of Productive Safety Net Program Beneficiary Households: A Logistic Analysis, Tigrai-Ethiopia. *European Journal of Business and Economics*, *8*(4). https://doi.org/10.12955/ejbe.v8i4.423

Gentilini, A. B. U (2013) Social Safety Nets: Lessons from Global Evidence and Practice, The World Bank. Washington DC

Giannozzi, S. & Khan, A (2011) Strengthening Governance of Social Safety Nets in East Asia. *The World Bank,* Washington DC

Gikiri, L. W (2012) An investigation of the effect of fraud risk management practices on fraud risk in commercial banks in Kenya. Nairobi.

Harbitz, M. E and Tamargo, M. C (2009) The Significance of Legal Identity in Situations of Poverty and Social Exclusion. The Link between Gender, Ethnicity, and Legal Identity. Inter-American Development Bank. Washington, DC

Harris, A.J. and (2002), "Biometric authentication: assuring access to information", *Information Management & Computer Security*, Vol. 10 No.1, pp. 12-19. https://doi.org/10.1108/09685220210417463

https://emergency.unhcr.org/entry/257802/cash-based-interventions-cbis

https://emergencymanual.iom.int/entry/26763/cashbased-interventions-cbis

https://en.unesco.org/news/south-sudan-commemorates-international-literacy-day-ild

https://www.tdcommercialbanking.com/document/PDF/fraudprevention.pdf

https://www.unhcr.org/afr/publications/fundraising/5a0c05027/unhcr-global-appeal-2018-2019-full-report.html?query=South%20Sudanese%20IDP

https://www.worldbank.org/en/news/press-release/2018/04/19/financial-inclusion-on-the-rise-but-gaps-remain-global-findex-database-shows

https://www.worldbank.org/en/topic/safetynets

IES (2019). The Cultural Atlas. Retrieved from: https://culturalatlas.sbs. com. au/.

Jamshidi-Navid, B. and Arad, H., Arad, H. (2010) *A Clear Look at Internal Controls: Theory and Concepts.*
SSRN: https://ssrn.com/abstract=1342048 or http://dx.doi.org/10.2139/ssrn.1342048

Jimu, I. M., & Msilimba, G (2018). Targeting Practices and Biases in Social Cash Transfers: Experiences in Rural Malawi. Africa Development / Afrique et Développement, 43(2), 65–84. https://www.jstor.org/stable/26640999

Khalid, K., Hilman, H. and Kumar, D (2012). *Get Along with Quantitative Research Process*: International Journal of Research in Management, Issue2, Vol. 2. ISSN 2249-5908\

Kim, S., Sohn, H.-S., & Lee, J (2020). Evaluating Participation: Empirical Analysis of Recipient and Beneficiary Engagement with IFAD International Development Projects. *Sustainability*, *12*(14), 5862. https://doi.org/10.3390/su12145862

Kim, T (2007). *The dynamics of ethnic name maintenance and change:* Cases of Korean ESL immigrants in Toronto. Journal of Multilingual and Multicultural Development, 28(2): 117–133

Knechel, W. and Krishnan, Gopal and Pevzner, Mikhail and Shefchik, Lori and Velury, Uma. (2012). *Audit Quality*: Insights from the Academic Literature. AUDITING: A Journal of Practice and Theory. 32. 10.2139/ssrn.2040754.

Kombo, K.D. and Tromp, L.A.D (2006). *Proposal and Thesis Writing*: An Introduction. Paulines Publishers, Nairobi

Kroskrity, P (1993). *Language, history, and identity:* Ethnolinguistic studies of the Arizona Tewa, Tucson, AZ: University of Arizona

Kubai, P. M (2021). *The Impact of Older Persons Cash Transfer Programmes in Kenya-A Case Study of Rural Kenya*. Master of Science in International Development Studies. Faculty Of Landscape and Society. Nairobi.

Kumar, D., & Ryu, Y. (2009). A Brief Introduction of Biometrics and Fingerprint Payment Technology. *International Journal of Advanced Science and Technology*, *4*, 25–38. https://www.earticle.net/Article/A147268

Kwasniewski, L., & Bojanowski, C (2015). Principles of Verification and Validation. *Journal of Structural Fire Engineering*, *6*(1), 29–40. https://doi.org/10.1260/2040-2317.6.1.29

Lakis, V. and Giriūnas, L (2012). The Concept of Internal Control System: Theoretical Aspect. Ekonomika. 91. 142-152. 10.15388/Ekon.2012.0.890.

Lameck, W. U (2013) *Sampling Design, Validity and Reliability in General Social Survey,* International Journal of Academic Research in Business and Social Sciences, Vol. 3, No. 7 ISSN: 2222-6990 DOI: 10.6007/IJARBSS/v3-i7/27

Lavrakas, P. J (2008). *Encyclopedia of survey research methods*; Vols. 1-0. Thousand Oaks, CA: Sage Publications, Inc. doi: 10.4135/9781412963947

Mahier, J., Pasquet, M., Rosenberger, C., & Cuozzo, F (2009). Biometric Authentication. *Encyclopedia of Information Science and Technology, Second Edition*, 346–354. https://doi.org/10.4018/978-1-60566-026-4.ch059

Mahwasane, M. M., & Tshifaro, T. J (2019). New-born baby naming practices of the Vhavenḓa: A sociolinguistic analysis perspective. South African Journal of African Languages, 39(2), 175–184. https://www.ajol.info/index.php/sajal/article/view/188074

Malathi, R. Jeberson, R. R. R (2016) *An Integrated Approach of Physical Biometric Authentication System, Procedia Computer Science*, Volume 85, Pages 820-826, ISSN 1877-0509, https://doi.org/10.1016/j.procs.2016.05.271

Martinez-Mesa, J., Gonzalez-Chica, D. A., Duquia, R. P., Bonamigo, R. R., and Bastos, J. L. (2016). *Sampling: how to select participants in my research study*?. Anais brasileiros de dermatologia, *91*(3), 326–330. https://doi.org/10.1590/abd1806-4841.20165254

Mbewe, L (2020) Assessement of The Impact of Social Cash Transfer Programmes on well-being of Vulnerable People-Elderly People, A Case Of Chadiza District of Eastern Province. Zambia

Miaoulis, G and Michener, D. R. (1976) *An Introduction to Sampling.* Dubuque: Kendull/ Hunt Pub Co.

Mishra, S. B and Alok, S (2017). *Handbook of Research Methods*: Edu-creation Publishing

Mroz-Gorgon, B., Wodo, W., Andrych, A., Caban-Piaskowska, K., & Kozyra, C (2022). Biometrics Innovation and Payment Sector Perception. Sustainability, 14(15), 9424. https://doi.org/10.3390/su14159424

Mugenda, O. M., and Mugenda, A. G (1999).*Research methods:* Quantitative and Qualitative Approaches.Nairobi: Acts Press.

Mugenda, O. M., and Mugenda, A. G (2003). *Research methods: Qualitative and Quantitative Approaches*. Nairobi: Acts Press.

Mulder, H. L. and Van de Velde-Schlick, B. F (1979). *Philosophical Papers.* Volume II. Dordrecht: D. Reidel

Muralidharan, K., Niehaus, P. and Sukhtankar, S (2014) *Payments Infrastructure and the Performance of Public Programs*: Evidence from Biometric Smartcards in India. UC San Diego. UC San Diego Dartmouth College

Mwacharo, E. M (2013) Factors Influencing Effective Production and Issuance of Identity Cards In Nairobi County, Kenya, Nairobi

Mwangi, E. W (2016) Information quality assessment framework: case of the national safety net program single registry system

Nelson, E. J (1954). The Verification Theory of Meaning. *The Philosophical Review*, *63*(2), 182. https://doi.org/10.2307/2182344

Ninno, Subbarao, K., Kjellgren, A., & Quintana, R (2013). Improving Payment Mechanisms in Cash-Based Safety Net Programs. *Handle.net*. https://doi.org/http://documents.worldbank.org/curated/en/2013/08/18821509/improving-payment-mechanisms-cash-based-safety-net-programs

Njagi, L. W (2009) Effectiveness of Know Your Customer (Kyc) Policies Adopted by Commercial Banks in Kenya in Reducing Money Laundering and Fraud Incidences. Nairobi

Njoroge, M. N (2013). Determinants of The Effectiveness of Cash Transfer Programmes on The Livelihood Status of The Urban Poor: A Case of Korogocho Slums, Nairobi County, Kenya. Nairobi.

Obi Ogbanufe, Dan J. Kim (2018) Comparing fingerprint-based biometrics authentication versus traditional authentication methods for e-payment, Decision Support Systems, Volume 106, Pages 1-14, ISSN 0167-9236, https://doi.org/10.1016/j.dss.2017.11.003.

Odero, Shirley A (2014) The Effect of Social Cash Transfers on Financial Inclusion in

Kenya: a Study of Kenya Social Protection Interventions. Nairobi

Ogola, J. O., K'Aol, G. O., Linge, T. K (2016) The Effect of Corporate Governance on Occurrence of Fraud in Commercial Banks in Kenya
URI: http://erepo.usiu.ac.ke/11732/3066

Olken, B. A. 2006. *Corruption and the Costs of Redistribution*. J. Public Econ. 90 (4–5): 853–70

Oso, W. Y., and Onen, D (2011). Writing Research Proposal and Report: A Handbook for Beginning Researchers, Rsvd edn. Nairobi-Kenya: The Jomo Kenyatta Foundation.

Onyango, N O (2014) Factors influencing timely registration of persons in Kisumu city Kenya. Nairobi

Orodho, A. J (2003). *Essentials of educational and social sciences research method*. Nairobi: Masola Publishers.

Oso, W. Y. and Onen, D (2008). *A general guide to writing research proposal and report: A handbook for beginning researchers* (2nd ed.). Kampala; Uganda: Makerere University Printer.

Owino, B (2020) Harmonising data systems for cash transfer programming in emergencies in Somalia. *Int J Humanitarian Action* **5**, 11 (2020). https://doi.org/10.1186/s41018-020-00077-1

Pingali, P., Aiyar, A., Abraham, M and Rahman, A (2019) *Reimagining Safety Net Programs Transforming Food Systems for a Rising India* pp 135–164 Cite as Palgrave Macmillan

Podio, F. and Dunn, J (2001), Biometric Authentication Technology: From the Movies to Your Desktop, Medical Records Institute Newsletter, https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=151524

Pritchard, E.E (2016) [1940]. NUER: *a description of the modes of livelihood and political institutions of a nilotic people* (classic reprint). Forgotten Books. ISBN 978-1-33380-312-4. OCLC 980437822.

Rae, K. and Subramaniam, N (2008). *Quality of internal control procedures*: Antecedents and moderating effect on organizational justice and employee fraud. Managerial Auditing Journal, 23 (2), 104-124.

Ryle, G (1951). The Verification Principle. Revue Internationale de Philosophie, 5(17/18 (3/4)), 243–250. http://www.jstor.org/stable/23932759

Rymes, B (1996). *Naming as social practice: The case of Little Creeper from Diamond Street.* Language in Society, 25(2), 237–260. https://doi.org/10.1017/s0047404500020625

Salway, B (1994). What's in a Name? A Survey of Roman Onomastic Practice from c. 700 B.C. to A.D. 700", in Journal of Roman Studies, vol. 84, pp. 124–145

Sarwar, N (2011). *Breakup of Sudan: Challenges for North and South.* Strategic Studies, 31(1/2), 224-240.

Saunders, M., Lewis P., and Thornhill, A (2009). *Research Methods for Business Students*. (5th ed). New Jersey: Prentice Hall.

Sawe, B. E (2017). *Ethnic groups of South Sudan*. https://www.worldatlas.com/articles/ethnic-groups-of-south-sudan.html

Seligman, C., and Seligman, B (1928). *The Bari*. The Journal of the Royal Anthropological Institute of Great Britain and Ireland, 58, 409-479. doi:10.2307/2843631

Shem, A. O.; Misati, R.; Njoroge,L.; (2012). *Factors driving usage of financial services from different financial access strands in Kenya, Savings and Development*, Vol. 36(1): 71- 89.

Schuchter, A (2013). The Fraud Triangle revisited. SpringerLink.

https://link.springer.com/article/10.1057/sj.2013.1?error=cookies_not_supported&code=356478b4-1d23-4097-b6f9-17173edf3831

Shweder, R. A., Goodnow, J., Hatono, G., LeVine, R. A., Markus, H. and Miller, P (1998). The cultural psychology of development: One mind, many mentalities. In Handbook of child psychology: Theoretical models of human development, Edited by: Damon, W. and Lerner, R. M. Vol. 1, 867–937. New York, NY: John Wiley & Sons

Skaras, M (2017), *Educational and Social Challenges in the Reintegration Process of Former Child Soldiers*, The Power of Resistance (Advances in Education in Diverse Communities, Vol. 12), Emerald Publishing Limited, Bingley, pp. 243-263. https://doi.org/10.1108/S1479-358X20140000012012

South Sudan - Safety Net Project (2020). Washington, D.C.: World Bank Group.

Stevens, J. P (2012) Applied Multivariate Statistics for the Social Sciences. 5th edn. London: Routledge.

http://documents.worldbank.org/curated/en/108181587397967837/South-Sudan-Safety-Net-Project

Stryker, S (1987). Identity theory: Developments and extensions. In K. Yardley & T. Honess (Eds.), *Self and identity: Psychosocial perspectives* (pp. 89–103). John Wiley & Sons.

Su, C. A. and Telles, E. E (2007). *Assimilation and gender in naming*. American Journal of Sociology, 112(5): 1383–1415

Tajfel, H.; Turner, J. C (1979). "An integrative theory of intergroup conflict". In W. G. Austin; S. Worchel (eds.). The social psychology of intergroup relations. Monterey, CA: Brooks/Cole. pp. 33–47.

Tasha, L. N. B (2021) *The Impact of Cash Transfers on Women's Economic Empowerment In an African Context.* Centre for Development and Environment. University of Oslo

Telford, J (1997) *Counting and identification of beneficiary populations in emergency operations: registration and its alternatives*. Overseas Development Institute, London. ISBN: 0-85003-253-0

The World Bank (2012). *Status and Challenges for a New System. Africa Human Development Series.* Education in South Sudan https://doi.org/10.1596/978-0-8213-8891-4

The Word Bank (2018). *Project Information Document/ Integrated Safeguards Data Sheet (PID/ISDS).* Concept Stage | Report No: PIDISDSC25999, Washington, D.C.

The Word Bank (2020). *International Development Association Project Appraisal Document on a proposed grant* in *the Amount of Sdr 29.1 Million (Us$ 40 Million Equivalent).* South Sudan Safety Net Project (SSSNP) (P169274) | Report No: PAD3194, Washington, D.C.

The World Bank (2021) Addressing Country Level Fiscal and Financial Sector Vulnerabilities ieg.worldbankgroup.org https://ieg.worldbankgroup.org/evaluations/addressing-country-level-fiscal-and-financial-sector-vulnerabilities/overview

Thompson, R (2006). *Bilingual, bicultural, and binominal identities: Personal name investment and the imagination in the lives of Korean Americans*. Journal of Language, Identity & Education, 5(3): 179–208

Tiriboyi, C (2015) The Impact Of Fraud And Corruption On The Effectiveness of Customs Duties Collection: Case of Zimbabwe Revenue Authority. Gweru: Zimbabwe

Turner, John; Oakes, Penny (1986). "The significance of the social identity concept for social psychology with reference to individualism, interactionism and social influence". British Journal of Social Psychology. 25 (3): 237–252. doi:10.1111/j.2044-8309.1986.tb00732.

UIS. Education: Literacy rate. data.uis.unesco.org. Retrieved 22 May 2016.

UNESCO Institute for Statistics (2015). Adult and Youth Literacy. UIS Fact Sheet. No. 32. Archived from the original

Vacca, J (2007). *Biometric Technologies and Verification Systems* (1st ed.). Butterworth-Heinemann.

Vonya Global (2009). *Final report on the strategic plan for prevention and Detection of fraud*: UK, Vonya Global

Wang, J. S (2021). Exploring biometric identification in FinTech applications based on the modified TAM. Financial Innovation, 7(1). https://doi.org/10.1186/s40854-021-00260-2

Weiss, K. (2011). Mobile payments, digital wallets and tunnel vision. *Biometric Technology Today*, *2011*(9), 8–9. https://doi.org/10.1016/s0969-4765(11)70171-0

Wencheng, Y.; Song, W.; Jiankun, H.; Guanglou, Z; Craig, V (2019), *Security and Accuracy of Fingerprint- Based Biometrics*: A Review. MDPI, Australia

Yang, W. Hu, J. Wang, S. Yang, J. Shu, Lei (2013) *Biometrics for securing mobile payments: Benefits, challenges and solutions*. Volume 3

Zibihollah, Rezaee (2002). *Financial Statement Fraud Prevention and Detection.* New York. John Wiley and Sons, Inc

APPENDICES

APPENDIX I: WORK PLAN

Activities	Jan-Aug 2021	Mar-Sept 2022	Oct-22	Oct-22	Nov-22
Writing a research proposal					
Consultations					
Submission of research proposal					
Data collection					
Data analysis and processing					
Submission					

Source: Researcher (2022)

APPENDIX II: BUDGET

ITEMS	NO. OF ITEMS	DESCRIPTIONS	TOTAL AMOUNT IN (SSP)
STATIONARY	3	Writing materials	800.00
		8 reams @ 2,500	20,000.00
	1	2 flash disk @ 2,000	4,000.00
PERSONNEL		Research Assistant	6,000.00
SERVICES		Photocopy, printing and binding	10,000.00
TRAVELLING		Movement to the locations	106,000.00
INTERNET BROWSING			4,000.00
MISCELLANEOUS		10% of budget SSP35,380.00	3,580.00
TOTAL			**154,380.00**

Source: Researcher (2022)

APPENDIX III: QUESTIONNAIRE

This questionnaire is a requirement for the partial fulfilment of the Master of Business Administration Corporate Management at KCA University. The Purpose of the Study is to Determine The effect of biometric technology on the efficiency of beneficiary payments in South Sudan Safety Net Projects.

This questionnaire consists of six sections (Sections A to F). Kindly respond to all questions by putting a tick (✓) in the box matching your answer or write your answer in the space provided if it is not included in the choices.

The information given here will only be used for purposes of academic study and will be treated with utmost confidentiality. Your cooperation will be highly appreciated.

SECTION A: PERSONAL INFORMATION

1. Name: _____ _____ _____ _____

2. Identification Document:

Jinsia [ ] National Identity [ ] Passport [ ] No Document [ ]

Identity document number [_____]

3. Gender

Male [ ] Female [ ]

4. Marital Status

Married [ ] Single [ ] Divorced [ ] Widow/ Widower [ ]

5. If married, which married arrangement

Monogamous [ ] Polygamous [ ]

6. Family Size (members)

Below 5 [ ] Between 5-10 [ ] Between 10-20 [ ] Over 20 [ ]

7. Age bracket grouping

18-30 yrs [ ] 31-40yrs [ ] 41- 50yrs [ ] 50yrs and above [ ]

8. Highest Education certification Attained

Primary Certificate	[ ]	Secondary Certificate	[ ]	Diploma	[ ]
Bachelor's Degree	[ ]	Masters Degree	[ ]	No Education	[ ]
Drop out of school	[ ]				

9. Employment status

Employed Full Time	[ ]	Employed Part Time	[ ]
Self Employed	[ ]	Unemployed	[ ]

SECTION B: BIOMETRIC BENEFICIARY IDENTIFICATION TECHNOLOGY

Questions in this section will tend to the effectiveness of biometric beneficiary identification technology on the efficiency of payments to the beneficiaries enrolled to receive funds in South Sudan Safety Net Projects

On scale of 1-5 kindly tick as appropriate

1-Strongly Disagree, **2**- Disagree, **3**-Neutral,**4**- Agree, **5**- Strongly Agree

Please share comments about your level of satisfaction with Biometric Verification and validation supporting lack of identification documents

Beneficiary Identification	**1**	**2**	**3**	**4**	**5**
Biometric technology enhances and assures positive identification of every individual beneficiary					
Biometric technology enhances due diligence on the beneficiaries where additional proof is needed					
Biometric Technology increases the end to end efficiency of the payment process					
Biometric Technology will help reduce possible beneficiary verification and validation miss-match					
Biometric Technology the assurance in confirming that the beneficiary purported to have been paid received funds					

SECTION C: BIOMETRIC NAMING CONVENTION

Questions in this section will tend to the efficiency of Biometric Technology supporting differentiation of various beneficiaries who may have similarity in names.

On scale of 1-5 kindly tick as appropriate

1-Strongly Disagree, **2**- Disagree, **3**-Neutral,**4**- Agree, **5**- Strongly Agree

Please share comments about your level of satisfaction with Biometric Technology addressing Naming Convention

Naming Convention	**1**	**2**	**3**	**4**	**5**
Biometric technology will help in eliminate instances of erroneous payment to a beneficiary with similar names					
Biometric Technology ensures payment is made to the intended beneficiary					
Biometric Technology ensures that specific beneficiary with similar names as another are served with ease					
Biometric technology helps in easier differentiation of beneficiaries.					
Biometric technology will help provide quality assurance in efficient payment exercise where names are a close match					

SECTION D: BIOMETRIC TECHNOLOGY SUPPORTING PAYMENT TO ILLITERATE BENEFICIARIES

Questions in this section will tend to the efficiency of Biometric Technology supporting the payments to beneficiaries who may not have satisfactory level of education or do not have any formal education.

On scale of 1-5 kindly tick as appropriate

1-Strongly Disagree, **2**- Disagree, **3**-Neutral,**4**- Agree, **5**- Strongly Agree

Please share comments about your level of satisfaction with Biometric Technology supporting the illiterate beneficiaries

illiterate beneficiaries	**1**	**2**	**3**	**4**	**5**
Biometric technology helps in eliminating unnecessary paper work required of the beneficiaries before and after the disbursement of funds					
Biometric technology helps bridge the lack of education to efficiently serve the beneficiaries					
Biometric technology helps provide the beneficiaries with some level of comfort on the integrity of the payment exercise					
Biometric technology helps to simplify the payment process for the illiterate beneficiaries					
Biometric technology helps leveling the environment to suite both literate and illiterate					
Biometric technology helps in covering the stigma and shame for illiterate beneficiary during the payment process					

SECTION E: BIOMETRIC SAFEGUARDS

Questions in this section will tend to the effectiveness of Biometric Fraud Prevention on the efficiency of Beneficiary Payments

On scale of 1-5 kindly tick as appropriate

1-Strongly Disagree, **2**- Disagree, **3**-Neutral,**4**- Agree, **5**- Strongly Agree

Please share comments about your level of satisfaction with Biometric Fraud Mitigation

Safe Guards	**1**	**2**	**3**	**4**	**5**
Biometric technology helps eliminate identity and frustrate fraud					
Biometric technology helps eliminate instances of double payment to the same beneficiary					
Biometric technology helps eliminate/ reduce/ frustrate/ arrest payment process corruption attempts					
Biometric technology helps eliminate/ reduce instances of illegitimate non- receipt claims					
Biometric technology helps improve the integrity of the payment process					
Biometric technology helps in keeping away illegitimate beneficiaries					

SECTION F: BIOMETRIC TECHNOLOGY

Questions in this section will tend to the effectiveness of Biometric Technology on the efficiency of Beneficiary Payments

On scale of 1-5 kindly tick as appropriate

1-Strongly Disagree, **2**- Disagree, **3**-Neutral,**4**- Agree, **5**- Strongly Agree

Please share comments about your level of satisfaction with Biometric Fraud Mitigation

Biometric Technology	**1**	**2**	**3**	**4**	**5**
Biometric technology help in identification or recognition using physiological or behavioural characteristics of the beneficiaries					
Biometric technology helps in authentication of legit beneficiary					
Biometric technology helps ascertain that the actual beneficiary was present at the payment center					
Biometric technology helps eliminate/ reduce impersonation of beneficiaries					
Biometric technology helps provide alternative to conventional authentication e.g. passwords, pin codes, signatures and ink finger print captured on paper					
Biometric technology eliminate/ reduce fraud opportunities against legit beneficiaries					

THANK YOU FOR YOUR COOPERATION