

**Pension Systems as Development Infrastructure: A Conceptual Framework for Welfare, Health, and Inclusion in Ghana**

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Email: [eappiah.asare@central.edu.gh](mailto:eappiah.asare@central.edu.gh)**ABSTRACT**

Pension systems in low- and middle-income countries generate development effects extending far beyond retirement income provision, yet remain architecturally misaligned with the informal labour markets that dominate most African economies. This paper develops a conceptual framework that reconceptualises Ghana's pension system as development infrastructure, institutional arrangements that generate positive externalities, reduce transaction costs of old-age poverty, and produce welfare gains diffusing across sectors and generations. Using Conceptual Framework Analysis (Jabareen, 2009), the study synthesises more than 40 peer-reviewed studies and primary sources (supplemented by primary institutional sources) into an integrated explanatory model linking four policy inputs (pension design, administrative capacity, governance quality, and financial capability) through four mediating mechanisms (income security, bargaining power, labour reallocation, and health and wellbeing effects) to five development outcomes. The framework explicitly incorporates Ghana's defining institutional conditions, approximately 80% labour market informality, a population aged 60 and above projected to rise from 6.5% to 10.8% by 2050, limited administrative infrastructure, and weak enforcement capacity, as contextual moderators. Eight testable propositions are advanced, differentiated by evidence strength and each accompanied by observable indicators, comparison groups, and recommended empirical identification strategies. Priority reform areas include expanding informal sector coverage through digitised registration and flexible contributions, strengthening governance and transparency, integrating contributory and non-contributory pension components, enhancing financial literacy, and establishing robust monitoring and evaluation systems. The paper provides the first integrated theoretical foundation positioning Ghana's pension system as multidimensional development infrastructure, generating a coherent empirical research agenda applicable to comparable low- and middle-income economies.

**Keywords:** Pensions; Social Protection; Informality; Ghana; Development infrastructure; Conceptual framework.

**Introduction**

Ghana's pension landscape has undergone significant institutional transformation since the 2008 reform, which introduced a three-tier system comprising a public mandatory scheme administered by the Social Security and National Insurance Trust (SSNIT), mandatory occupational pensions, and voluntary private savings, both administered under the National Pensions and Regulatory Authority of Ghana. Despite these structural advances, effective coverage remains deeply uneven. Informal sector workers, who constitute approximately 80% of Ghana's labour force, are disproportionately excluded from meaningful pension participation due to administrative barriers, limited geographic accessibility, and documentation requirements that presuppose formal employment relationships (Kpessa, 2011a; Ghana Statistical Service, 2024). This coverage gap is not merely a technical deficiency; it reflects the broader mismatch between pension architectures designed around formal labour markets and the economic realities of a workforce dominated by self-employment, agriculture, and irregular income streams.

A growing body of empirical evidence, drawn substantially from Sub-Saharan Africa, Latin America, and Asia, demonstrates that pension systems generate development effects far beyond retirement income provision. Pension income shapes household welfare, health outcomes, labour supply decisions, and intergenerational relations, functioning in many developing-country contexts, as de facto social protection mechanisms (Barrientos et al., 2003; Lloyd-Sherlock & Agrawal, 2014; Willmore, 2007). Studies document that pension receipt improves nutrition and healthcare access for younger household members, reduces engagement in physically demanding work among older adults, and strengthens the bargaining power of recipients within households (Duflo, 2003; Abel, 2019; Huang & Zhang, 2021). Yet this literature remains fragmented across thematic and disciplinary boundaries and Ghana-specific insights are frequently embedded in broader comparative analyses rather than synthesised into a coherent national framework (Kpessa, 2011a; Porisky et al., 2023).

This paper addresses these gaps by developing a comprehensive conceptual framework that positions Ghana's pension system as development infrastructure, institutional arrangements that influence welfare, health, labour, and inclusion outcomes through multiple interacting channels. Rather than asking whether pensions work, the analysis asks how, through which mechanisms, and under what conditions, they shape development in Ghana's institutional context. The framework synthesises empirical findings from more than 40 peer-reviewed studies and primary sources into a unified theoretical structure, explicitly incorporates Ghana's defining contextual conditions, including exceptionally high informality, limited administrative capacity, and ongoing demographic transitions, as moderators conditioning pension system effectiveness, and advances eight testable propositions to guide empirical research and evidence-based policy design.

**Methodological Approach: Conceptual Framework Analysis**

This study employs Conceptual Framework Analysis (CFA) as its primary methodological approach. In accordance with Elsevier's generative AI policy, the authors disclose that AI-assisted tools (Claude, Anthropic) were used during literature organisation and manuscript preparation. All conceptual development, analytical decisions, theoretical synthesis, research propositions, and substantive conclusions represent the authors' original scholarly work, and the authors take full responsibility for all content. CFA, as developed by Jabareen (2009), is a qualitative theory-building methodology designed to synthesise heterogeneous bodies of empirical and theoretical knowledge into an integrated explanatory structure. It is epistemologically distinct from systematic review, which prioritises comprehensive coverage, and from meta-analysis, which aggregates quantitative effect sizes. CFA is appropriate precisely where the objective is theoretical integration across fragmented literatures rather than statistical estimation, and where the analytical goal is to identify recurring constructs, causal mechanisms, and contextual conditions that mediate or moderate relationships of interest. The methodology is particularly well suited to pension research in developing-country contexts, where empirical evidence is geographically dispersed, methodologically heterogeneous, and rarely synthesised into coherent theoretical frameworks applicable to specific national institutional settings. Following Jabareen's (2009) procedural guidelines, the analysis proceeds through four stages:

- (i) Mapping of selected multidisciplinary literature

- (ii) Extensive reading and categorization of texts (iii) Identification, naming, and deconstructing of concepts (iv) Integration of concepts into the final framework.

This procedure produces an analytical structure that is both theoretically grounded and empirically disciplined, distinguishing CFA from purely speculative conceptual work.

### 2.1 Literature Selection

The analysis draws on more than 40 peer-reviewed journal articles and primary sources selected for their relevance to pensions, social protection, and development outcomes in low- and middle-income countries, with particular emphasis on Sub-Saharan Africa. Studies are drawn from leading development economics, pension economics, and social policy journals including World Development, the American Economic Journal: Applied Economics, Journal of Development Economics, Journal of Pension Economics and Finance, and related outlets. Studies were selected using a purposive sampling approach operationalised through explicit inclusion and exclusion criteria. Inclusion criteria required: (1) publication in a peer-reviewed journal or as a primary institutional report with established development economics, social policy, or public health focus; (2) empirical or theoretical contributions directly addressing pension or social transfer impacts on welfare, health, labour, bargaining, governance, or financial literacy outcomes; (3) relevance to low- or middle-income country contexts, with particular weight given to Sub-Saharan African evidence; and (4) methodological rigour, including use of quasi-experimental designs, regression discontinuity, difference-in-differences, instrumental variable approaches, longitudinal data analysis, or robust multi-stage theoretical frameworks where applicable. Exclusion criteria eliminated: (a) studies focused exclusively on high-income country pension systems without transferable theoretical or empirical insights; (b) purely actuarial or financial sustainability analyses without welfare outcome components; and (c) descriptive studies lacking identifiable causal mechanisms or theoretical contributions. To mitigate the risk of confirmation bias inherent in purposive sampling, the search was expanded beyond initially identified sources through backward citation tracing from anchor papers and forward citation searches using Google Scholar. Where multiple studies addressed the same mechanism in the same context, the study with the strongest identification strategy was prioritised. Studies presenting disconfirming evidence or null findings were explicitly retained to avoid selective citation in support of propositions.

Criterion	Operationalisation
<b>Inclusion criteria</b>	
IC1 — Publication quality	Peer-reviewed journal article or primary institutional report with established development economics, social policy, or public health focus
IC2 — Substantive relevance	Empirical or theoretical contribution addressing pension or social transfer impacts on welfare, health, labour, bargaining, governance, or financial literacy outcomes
IC3 — Geographic relevance	Relevance to low- or middle-income country contexts; particular weight given to Sub-Saharan African evidence with transferable institutional insights
IC4 — Methodological rigour	Use of quasi-experimental designs, RDD, DiD, IV approaches, longitudinal data, or robust multi-stage theoretical framework with identifiable mechanisms
<b>Exclusion criteria</b>	
EC1 — Geographic scope	Studies focused exclusively on high-income country pension systems without transferable theoretical or empirical insights
EC2 — Actuarial focus	Purely actuarial or financial sustainability analyses without welfare outcome components or identifiable social mechanisms
EC3 — Descriptive only	Descriptive studies lacking identifiable causal mechanisms, theoretical contributions, or comparative analytical frameworks

Note: To mitigate confirmation bias, the search was expanded through backward citation tracing and forward citation searches via Google Scholar. Studies with null findings or disconfirming evidence were explicitly retained. RDD = regression discontinuity design; DiD = difference-in-differences; IV = instrumental variable.

### 2.2 Analytical Procedure

The synthesis followed Jabareen’s (2009) four-stage CFA procedure, operationalised as follows. In Stage 1 (literature mapping), sources were read in full and annotated for theoretical orientation, empirical context, key constructs, and principal findings. In Stage 2 (extensive reading and categorisation), each study was systematically coded for: dependent variables (e.g., poverty headcount, healthcare utilisation, child schooling, labour supply intensity); independent variables (e.g., pension benefit level, contribution design, administrative digitalisation); mediating mechanisms (e.g., income security, bargaining power, labour reallocation, stress reduction); and contextual conditions (e.g., informality rate, state administrative capacity, institutional quality, demographic structure). Coding was conducted iteratively, with categories refined across multiple readings until saturation was reached and no new construct types emerged. In Stage 3 (concept identification and deconstruction), constructs that recurred across three or more studies were elevated to framework-level concepts. Each concept was deconstructed to identify its theoretical antecedents, empirical indicators, and Ghana-specific manifestations. In Stage 4 (framework synthesis), directional relationships among constructs were mapped to identify direct effects, indirect effects mediated through specific mechanisms, and conditional effects moderated by context. To assess robustness, a structured sensitivity check was conducted: each proposed relationship in the framework was tested against available disconfirming evidence, and propositions were modified where evidence was mixed or contextdependent. The resulting framework distinguishes between relationships with strong multicountry empirical support (Propositions 1, 3, 4, 5), relationships with moderate support requiring Ghana-specific validation (Propositions 2, 6, 7), and relationships where evidence is contextdependent and requires careful qualification (Proposition 8). This iterative process produced the integrated framework presented in Figure 2, which synthesizes insights across studies while preserving theoretical coherence and empirical grounding. Figure 1 illustrates the three-stage CFA procedure and the specific outputs generated at each stage.

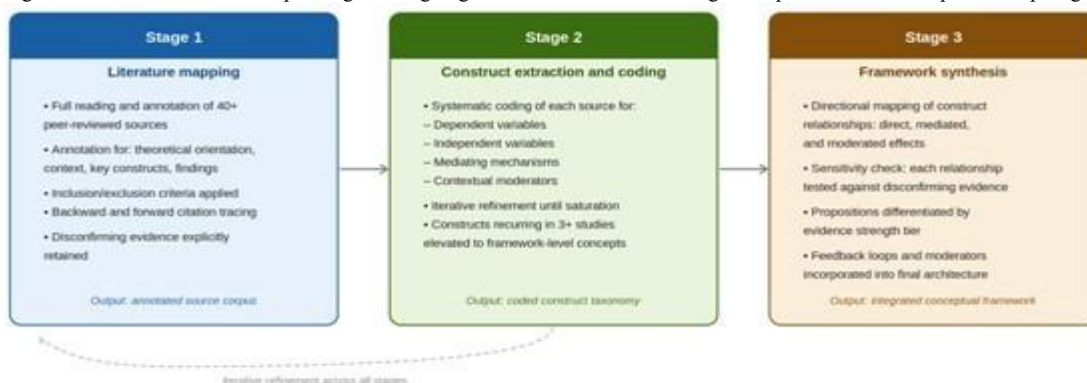


Figure 1: Three-stage Conceptual Framework Analysis procedure applied in this study, following Jabareen (2009). Each stage produces a specific output that feeds into the next stage, with an iterative refinement loop across all stages.

Theoretical Foundations

The central conceptual claim of this paper, that pension systems constitute development infrastructure, requires explicit theoretical grounding before the four supporting traditions are introduced. Infrastructure, in its classic economic formulation, refers to facilities and institutional arrangements that generate positive externalities beyond their direct users, reduce transaction costs across the economy, and produce non-rival or non-excludable public goods whose benefits diffuse across sectors and generations (Holzmann & Hinz, 2005; Barr & Diamond, 2006). Physical infrastructure (roads, electricity grids, and telecommunications) meets this definition by enabling production and exchange far beyond the direct construction investment. The argument advanced here is that pension systems satisfy the same criteria in the social domain: they generate welfare externalities (improved child nutrition, school enrolment, labour mobility) that extend far beyond pension recipients themselves; they reduce transaction costs associated with old-age poverty (informal transfers from working-age household members, emergency asset liquidation, early labour force exit by younger members); and their developmental benefits are non-rival in the sense that governance improvements, expanded administrative infrastructure, and increased trust in formal institutions benefit all potential contributors, not only current beneficiaries. This framing departs from narrow actuarial or fiscal treatments of pension systems and aligns instead with the social protection-as-development-investment literature (Barrientos et al., 2003; Barrientos, 2010), which conceptualises transfers as enabling household-level investments that aggregate into economy-wide development gains. The conceptual framework integrates insights from four theoretical traditions that together explain the mechanisms through which pension systems generate these infrastructure-type effects: social protection theory, household bargaining models, labour supply theory under informality, and institutional governance theory. Together, these perspectives explain how pension systems influence development outcomes through income security, agency, behavioural responses, and institutional performance, while accounting for constraints imposed by informality and administrative capacity (Barrientos, 2010; Duflo, 2003; Barr & Diamond, 2006).

**3.1 Social Protection Theory :** Social protection theory posits that income transfers reduce vulnerability and enable households to invest in welfare-enhancing activities (Barrientos et al., 2003). Pensions provide predictable income flows that reduce exposure to idiosyncratic shocks, smooth consumption over the life cycle, and enable accumulation of productive assets (Morduch, 1995; Holzmann & Jørgensen, 2001). In contexts of high informality and income volatility, pension income may represent the only reliable source of regular cash, fundamentally altering household resource constraints and enabling investments in health, education, and economic activities that would otherwise be deferred or forgone (Dercon, 2002; Barrientos, 2002; Willmore, 2007).

**3.2 Household Bargaining Models:** Household bargaining models, building on collective household frameworks, suggest that income accruing to specific household members alters intrahousehold power dynamics and resource allocation (Duflo, 2003). When pension income is received by older household members, particularly women, it enhances their bargaining power and shifts consumption toward goods that benefit children, health, and nutrition (Doss, 2013; Duflo, 2003). Evidence from South Africa and China confirms that pension receipt by grandmothers improves child nutrition and school enrolment beyond what would be predicted by aggregate household income effects alone (Duflo, 2003; Huang & Zhang, 2021; You & Niño-Zarazúa, 2019).

**3.3 Labour Supply Theory under Informality :** Standard labour supply theory predicts that non-labour income reduces labour supply through income effects. However, in contexts of high informality and incomplete credit markets, pension income may instead enable strategic labour reallocation, reducing engagement in physically demanding or low-productivity work while maintaining participation in less strenuous activities (Abel, 2019; Ardington et al., 2009; Tondini et al., 2023). This is particularly relevant in Ghana, where informal sector workers often continue working into old age but may adjust work intensity, occupational choice, or sectoral participation in response to pension income (Oteng et al., 2022; Collins-Sowah et al., 2013).

**3.4 Institutional Governance Theory :** Institutional governance theory emphasises that the effectiveness of social protection programs depends critically on administrative capacity, governance quality, and regulatory oversight (Cai et al., 2012; Hiilamo et al., 2020). In the context of pension systems, weak registration systems, payment delays, corruption, and limited enforcement constrain coverage and undermine trust, particularly among informal sector workers who face higher transaction costs of participation (Enoff & McKinnon, 2011; Cai et al., 2012). Strengthening institutions, through digitization, transparency mechanisms and regulatory enforcement, is therefore a precondition for realising the developmental potential of pension systems (Enoff & McKinnon, 2011; Hiilamo et al., 2020).

Conceptual Framework: Pensions as Development Infrastructure in Ghana

Figure 1 presents the conceptual framework developed in this study. The framework positions Ghana’s pension system as a set of policy and institutional inputs that influence development outcomes through mediating mechanisms, conditional on contextual moderators that act on all stages of the causal chain. The framework is organised into four analytical levels arranged in a left-to-right causal architecture: (1) policy and institutional inputs (pension design, administrative capacity, governance quality, and financial capability); (2) mediating mechanisms through which inputs translate into outcomes (income security, bargaining power, labour reallocation, and health and wellbeing effects); (3) development outcomes (welfare, health, labour market, inclusion, and sustainability); and (4) contextual moderators that condition the strength and direction of relationships at all levels (labour market structure, state capacity, demographic context, and institutional environment). A feedback arrow from outcomes to inputs captures the dynamic and adaptive character of pension system development, acknowledging that outcome improvements, particularly coverage expansion and increased public trust, alter the institutional inputs available for subsequent reform cycles.

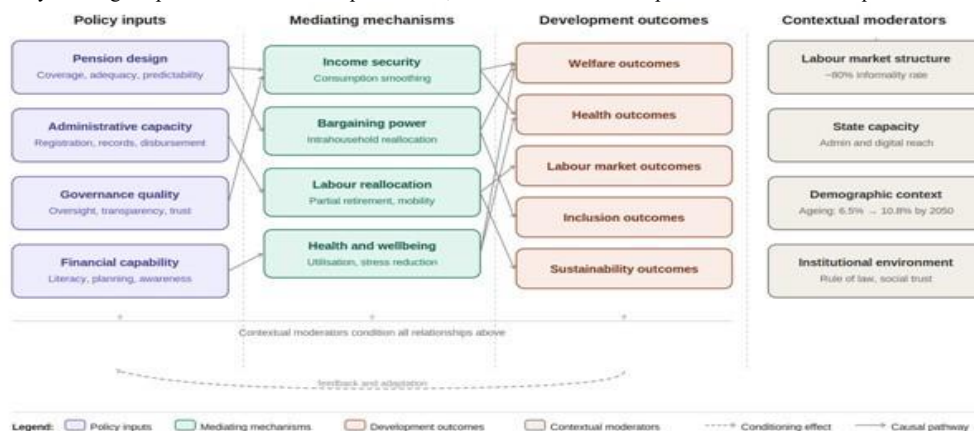


Figure 2: Conceptual framework: pension systems as development infrastructure in Ghana. The diagram maps four policy and institutional inputs (purple) through four mediating mechanisms (teal) to five development outcomes (coral), conditioned throughout by four contextual moderators (grey). A feedback path from outcomes to inputs captures the adaptive and dynamic character of pension system reform.

**4.1 Policy and Institutional Inputs :** The framework identifies four categories of policy and institutional inputs that shape pension system effectiveness: pension design, administrative capacity, governance quality, and financial capability. Pension design encompasses coverage breadth (who is eligible), benefit adequacy (replacement rates relative to pre-retirement income), and predictability (certainty of benefit receipt) (Holzmann & Hinz, 2005). Ghana's three-tier system, comprising the Social Security and National Insurance Trust (SSNIT) first tier, mandatory occupational pensions in the second tier, and voluntary private pensions in the third tier, exhibits significant variation across these dimensions (NPRA, 2009; Kpessa, 2011a). First-tier coverage remains limited to formal sector workers, benefit adequacy is constrained by contribution rates and investment returns, and predictability varies with administrative performance and financial sustainability (KpessaWhyte, 2020; Kpessa, 2011a, 2011b).

Administrative capacity refers to the institutional infrastructure required to register contributors, collect contributions, maintain records, and disburse benefits. In Ghana, administrative barriers, including limited geographic coverage of registration centres, documentation requirements, and payment infrastructure constraints, disproportionately affect informal sector workers, limiting effective coverage despite formal eligibility under recent reforms (Kpessa, 2011a; Collins-Sowah et al., 2013; Adzawla et al., 2015).

Governance quality encompasses regulatory oversight, transparency, accountability, and enforcement mechanisms (Musalem & Ortiz, 2011). Strong governance enhances trust, deters corruption, and ensures compliance with contribution and benefit rules (North, 1990). Weak governance, conversely, undermines legitimacy and discourages participation, particularly among informal workers who perceive high risks of non-payment or benefit delays (Appiah, A., 2025; Enoff & McKinnon, 2011).

Financial capability includes financial literacy, retirement planning skills, and understanding of pension mechanisms. Evidence from multiple contexts shows that low financial literacy constrains voluntary participation in contributory pensions, particularly in the third tier (Lusardi & Mitchell, 2011a; Klapper & Panos, 2011). In Ghana, where financial literacy levels are low and retirement planning is uncommon, capacity-building interventions may be necessary to stimulate voluntary coverage expansion (Sarpong-Kumankoma, 2023).

**4.2 Mediating Mechanisms :** The framework identifies four categories of mechanisms through which policy inputs translate into development outcomes: income security effects, bargaining power effects, labour supply effects, and health and wellbeing effects.

Income security effects operate through reductions in vulnerability to income shocks, enhanced consumption smoothing, and increased capacity for productive investment (Morduch, 1995). Regular pension income enables households to maintain consumption during adverse shocks (illness, crop failure, economic downturns), reducing reliance on negative coping strategies such as asset depletion or reduced food intake (Barrientos et al., 2003; Unnikrishnan & Imai, 2020). Moreover, predictable income flows enable planning and investment in activities with delayed returns, including education, preventive healthcare, and small business development (Unnikrishnan & Imai, 2020; Barrientos et al., 2003).

Bargaining power effects arise when pension income accrues to household members who previously lacked independent income. Evidence shows that pension receipt by older women strengthens their bargaining position within households, shifting resource allocation toward welfare-enhancing expenditures including nutrition, healthcare, and education for grandchildren (Duflo, 2003; Huang & Zhang, 2021). These effects are mediated by cultural norms regarding intrahousehold decision-making and gendered resource control (Doss, 2013).

Labour supply effects reflect adjustments in work intensity, occupational choice, and sectoral participation in response to non-labour income (Ardington et al., 2009). In high-informality contexts such as Ghana, pension income may enable older workers to reduce engagement in physically demanding or hazardous work without exiting the labour force entirely (Abel, 2019; Oteng et al., 2022). This pattern of 'partial retirement' or 'labour reallocation' differs from the complete labour force exit observed in advanced economies with mandatory retirement ages and comprehensive social security systems (Oteng et al., 2022).

Health and wellbeing effects operate through increased healthcare utilisation, improved nutrition, and reduced psychosocial stress. Pension income relaxes budget constraints that prevent access to healthcare services, medications, and nutritious food (Cheng et al., 2018; Lloyd-Sherlock & Agrawal, 2014). Additionally, income security reduces stress and anxiety associated with income volatility and old-age poverty, potentially improving mental health outcomes and overall quality of life (Pak, 2021).

**4.3 Development Outcomes :** The framework identifies five categories of development outcomes: welfare, health, labour markets, inclusion, and sustainability. Welfare outcomes include poverty reduction, consumption levels, and asset accumulation. Evidence from multiple contexts demonstrates that pension income reduces old-age poverty, increases household consumption, and enables asset accumulation (Case & Deaton, 1998; Huang & Zhang, 2021; Unnikrishnan & Imai, 2020). These effects often extend beyond direct beneficiaries to co-resident household members, including children and working-age adults (Huang & Zhang, 2021; Duflo, 2003).

Health outcomes encompass morbidity, mortality, and quality of life among older persons. Studies document improvements in objective physical health, cognitive function, and psychological wellbeing associated with pension receipt (Cheng et al., 2018; Pak, 2021). These effects are mediated by increased healthcare access, improved nutrition, and reduced stress (Cheng et al., 2018; Lloyd-Sherlock & Agrawal, 2014).

Labour market outcomes include labour supply, productivity, and formal-informal transitions. While pensions may reduce labour supply among older workers, they can also enable human capital investments among younger household members and facilitate occupational mobility (Ardington et al., 2009; Abel, 2019; Huang & Zhang, 2021). In Ghana's context, pension-induced labour supply reductions may improve productivity by enabling exit from physically demanding or hazardous occupations (Oteng et al., 2022).

Inclusion outcomes reflect coverage equity across income, gender, and geographic dimensions. Effective inclusion requires addressing administrative barriers that disproportionately exclude informal workers, rural populations, and women from pension coverage (Collins-Sowah et al., 2013; Adzawla et al., 2015; Porisky et al., 2023). In Ghana, where formal coverage remains concentrated among urban formal sector workers, inclusion gaps constitute a primary policy challenge (Kpessa, 2011a; Kpessa-Whyte, 2020).

Sustainability outcomes encompass financial viability and political legitimacy. Pension systems must balance benefit adequacy against fiscal sustainability, particularly as population age and dependency ratios raise. Moreover, systems require political legitimacy, reflected in public trust and compliance, to maintain support for contributions and reforms (Holzmann & Hinz, 2005; Musalem & Ortiz, 2011).

**4.4 Contextual Moderators :** The framework identifies four categories of contextual moderators that condition the relationships between policy inputs, mechanisms, and outcomes: labour market structure, state capacity, demographic context, and institutional environment.

Labour market structure, particularly the high rate of informality in Ghana, where approximately 80% of the workforce is engaged in informal activities (Ghana Statistical Service, 2024), fundamentally shapes pension system effectiveness. Informality complicates contribution enforcement, limits wage documentation for benefit calculation, and increases transaction costs of participation (Adzawla et al., 2015; Collins-Sowah et al., 2013). Moreover, income volatility and limited access to formal financial services constrain voluntary saving for retirement (CollinsSowah et al., 2013; World Bank, 2019).

State capacity encompasses administrative efficiency, digital infrastructure, and enforcement capability (Enoff & McKinnon, 2011). Limited state capacity in Ghana constrains geographic coverage of registration systems, delays benefit payments and undermines enforcement of

contribution compliance (Kpessa, 2011a; Appiah, P.O., 2023). Digitisation and mobile money infrastructure offer potential pathways to reduce administrative costs and expand coverage, particularly in rural areas (Baah-Boateng & Vanek, 2020; World Bank, 2019).

Demographic context includes population aging, dependency ratios, and migration patterns. Ghana is experiencing demographic transition, with the proportion of the population aged 60+ projected to increase from 6.5% in 2021 to 10.8% by 2050 (Ghana Statistical Service, 2024). This demographic shift will increase pressure on pension systems while potentially reducing the working-age population available to support older people through informal transfers (KpessaWhyte, 2018; Mba, 2010).

Institutional environment encompasses corruption levels, rule of law, and social trust (North, 1990). Weak institutional environments undermine public confidence in pension systems, reducing voluntary participation and encouraging evasion (Musalem & Ortiz, 2011; Enoff & McKinnon, 2011). Strengthening anticorruption mechanisms, judicial independence, and transparency can enhance trust and participation (Musalem & Ortiz, 2011; Enoff & McKinnon, 2011).

**Research Propositions**

Drawing on the conceptual framework and synthesized literature, this section advances eight testable propositions that can guide empirical research on pensions and development in Ghana. Table 2 provides a summary overview of all eight propositions, their evidence base, and operationalisation specifications. Full operationalisation criteria — including observable indicators, comparison groups, identification strategies, and key threats to validity — are provided for all eight propositions in Appendix A (Table A1).

No.	Statement	Evidence strength	Key indicators	Identification strategy
P1 Welfare effects	Greater pension benefit adequacy and predictability improve household welfare by enhancing income security and reducing vulnerability to income shocks.	Strong (SA, China, India; multiple RDD/DiD studies)	GLSS per capita consumption; poverty headcount; asset index	RDD on SSNIT ageeligibility threshold; DiD with pensioner household panel
P2 Health effects	Pension-induced income security improves healthcare utilisation and psychological wellbeing; effects on broad physical health are contextdependent.	Moderate (heterogeneous across China, S. Korea, SA)	NHIS visit frequency; GHQ12; PHQ-9; medication adherence	Longitudinal survey; age-matched nonrecipient control; wealth controls
No.	Statement	Evidence strength	Key indicators	Identification strategy
P3 Bargaining power	Pension receipt increases bargaining power of older household members, with larger effects for female recipients.	Strong for female recipients (SA, China); untested in Ghana	Child HAZ/WAZ; school enrolment; intrahousehold bargaining scale	Genderdisaggregated DiD; matrilineal vs. patrilineal heterogeneity
P4 Intergen- erational	Pension income generates intergenerational spillovers: reduced child labour, increased schooling, improved job search among co-resident members.	Strong (SA, China, India); moderate Ghana transferability	Child labour rate; enrolment; youth employment outcomes	DiD exploiting pension timing; restrict to preexisting coresidence households
P5 Labour supply	Pensions reduce engagement in physically demanding work without full retirement; outcome is occupational downgrade within the informal sector.	Strong (SA); Ghana untested; informal sector context differs	Physical demand hours; occupational category; work intensity index	Time-use survey; formal vs. informal sector comparison at eligibility age
P6 Admin barriers	Administrative barriers (documentary, geographic, cost) significantly constrain pension coverage among informal sector workers.	Moderate (Cambodia, multiple Africa); limited causal ID	Enrolment rate by district; contribution regularity; coverage duration	SEED rollout quasiexperiment; logistic regression on barrier dimensions
P7 Governance effects	Strong governance and regulatory oversight improve pension system sustainability, legitimacy, and voluntary participation.	Moderate (strong theory); limited causal ID in LMICs)	Afrobarometer trust index; benefit processing time; voluntary enrolment	Two-stage: perceptions to enrolment; ITS on governance reform events
P8 Financial capability	Financial literacy and behavioural design both moderate voluntary tier participation; only 27% of Ghanaians pass basic financial literacy questions.	Contextdependent (strong for literacy-planning link; mixed for interventions)	Tier 3 enrolment; contribution regularity at 6 and 12 months	RCT: literacy arm vs. behavioural design arm vs. control

Abbreviations: GLSS = Ghana Living Standards Survey; RDD = regression discontinuity design; DiD = difference-in-differences; ITS = interrupted time series; HAZ = height-for-age z-score; WAZ = weight-for-age zscore; NHIS = National Health Insurance Scheme; SA = South Africa; LMIC = low- and middle-income country; RCT = randomised controlled trial.

**Proposition 1 (Welfare Effects):** Greater pension benefit adequacy and predictability improve household welfare by enhancing income security and reducing vulnerability to income shocks.

This proposition builds on strong multi-country empirical evidence from South Africa, China, and India demonstrating that pension income reduces poverty rates, increases per capita consumption, and enables productive asset accumulation (Case & Deaton, 1998; Huang & Zhang, 2021; Unnikrishnan & Imai, 2020). In Ghana’s context, where informal transfers often fail to provide adequate income security for older persons (Kpessa-Whyte, 2018; Barrientos et al., 2003), even modest pension benefits may generate substantial welfare gains. Evidence strength: strong. Full operationalisation criteria, observable indicators, and identification strategy are provided in Appendix A (Table A1, P1).

**Proposition 2 (Health Effects):** Pension-induced income security improves the health of older persons through increased healthcare utilisation and reduced psychosocial stress.

This proposition is supported by evidence from China, South Korea, and South Africa showing that pension receipt increases healthcare utilisation, improves objective health measures including cognitive function, and enhances psychological wellbeing through reduced financial stress (Cheng et al., 2018; Lloyd-Sherlock & Agrawal, 2014; Pak, 2021). An important scope qualification applies: claims should be restricted to healthcare utilisation and psychological wellbeing rather than broad physical health outcomes, as effects on self-rated health are not consistently observed across contexts. In Ghana, where out-of-pocket healthcare costs remain elevated at 26% of total health expenditure despite the National Health Insurance Scheme (OseiAkoto & Edze, 2018), pension income may relax the budget constraint preventing NHIS copayment and associated costs. Evidence strength: moderate. Full operationalisation criteria are provided in Appendix A (Table A1, P2).

**Proposition 3 (Bargaining Power Effects):** Pension receipt increases the bargaining power of older household members, leading to reallocation of resources toward welfare-enhancing expenditures.

Evidence from South Africa and China demonstrates that pension income accruing to older women shifts household expenditure toward child nutrition, education, and healthcare, with effects that exceed those observed when equivalent income accrues to older men (Duflo, 2003; Huang & Zhang, 2021). In Ghana, where extended family structures are common and older women often have limited independent income (Kpessa-Whyte, 2018; Doss, 2013), pension receipt may significantly enhance their decision-making authority, with effects expected to vary across matrilineal and patrilineal ethnic groups. Evidence strength: strong for female recipients; untested for Ghana specifically. Full operationalisation criteria are provided in Appendix A (Table A1, P3).

**Proposition 4 (Intergenerational Effects):** Pension income generates intergenerational spillovers by increasing transfers to younger household members, influencing education and labour decisions.

Studies from South Africa, China, and India show that pension income enables increased educational investments, reduces child labour, and supports job search and geographic mobility among working-age household members (Edmonds, 2006; Ardington et al., 2009; Unnikrishnan & Imai, 2020). In Ghana, where intergenerational co-residence is common (Kpessa-Whyte, 2018; Mba, 2010), pension income may facilitate school enrolment among co-resident grandchildren and reduce the economic pressure that drives early labour force entry among youth. Evidence strength: strong for South African context; moderate transferability to Ghana. Full operationalisation criteria, including the critical identification requirement regarding coresidence timing, are provided in Appendix A (Table A1, P4).

**Proposition 5 (Labour Supply Effects):** In Ghana's informal labour market, pensions reduce engagement in physically demanding work among older adults without necessarily inducing full retirement.

Evidence from South Africa demonstrates that pension income enables partial labour force withdrawal, with older beneficiaries reducing engagement without fully retiring, and working-age household members gaining improved job search capacity through pension-supported migration (Abel, 2019; Ardington et al., 2009). In Ghana, where formal retirement is uncommon and social security coverage remains incomplete (Collins-Sowah et al., 2013; Adzawla et al., 2015), the relevant outcome is not labour force exit but occupational downgrade within the informal sector, from physically demanding activities toward less strenuous roles. Evidence strength: strong for South Africa; plausible but untested for Ghana. Full operationalisation criteria are provided in Appendix A (Table A1, P5).

**Proposition 6 (Administrative Barriers):** Administrative barriers significantly constrain pension coverage among informal sector workers, limiting realized development impacts.

Evidence from Cambodia and multiple African contexts demonstrates that administrative complexity, documentation requirements, and geographic accessibility constrain pension enrolment among informal workers (Hiilamo et al., 2020; Porisky et al., 2023; Kidd, 2018; World Bank, 2019). In Ghana, where informal workers constitute approximately 80% of the workforce (Ghana Statistical Service, 2024) and administrative capacity is limited (Adzawla et al., 2015; Collins-Sowah et al., 2013), administrative barriers represent the primary constraint on coverage expansion. Notably, the staggered rollout of SSNIT's SEED programme across districts creates a natural quasi-experiment for testing digitisation effects. Evidence strength: moderate. Full operationalisation criteria are provided in Appendix A (Table A1, P6).

**Proposition 7 (Governance Effects):** Strong governance and regulatory oversight improve pension system sustainability, legitimacy, and participation.

Evidence from multiple developing-country contexts shows that governance quality, encompassing transparency, accountability, regulatory independence, and enforcement capacity, enhances public trust in pension systems and sustains voluntary participation (Musalem & Ortiz, 2011; North, 1990). Conversely, corruption, benefit delays, and weak oversight undermine confidence and encourage contribution evasion, particularly among informal sector workers who face higher perceived risks of non-payment (North, 1990; Enoff & McKinnon, 2011; Appiah, P.O., 2023). In Ghana, documented governance weaknesses in SSNIT and NPRA, including benefit processing delays, limited public reporting of investment returns, and inadequate grievance mechanisms, likely depress voluntary participation below its potential level. Evidence strength: moderate. Full operationalisation criteria, including the three-dimensional governance measurement approach and two-stage identification strategy, are provided in Appendix A (Table A1, P7).

**Proposition 8 (Financial Capability):** Financial literacy and retirement planning capability moderate the effectiveness of contributory pension schemes, particularly within voluntary tiers.

Evidence from Russia, the United States, and New Zealand demonstrates that the relationship between financial literacy and retirement planning is significant in contexts requiring active voluntary decision-making, while attenuated where universal pensions provide a default income floor (Klapper & Panos, 2011; Lusardi & Mitchell, 2011a; Crossan et al., 2011). This contextdependency is analytically important: the proposition is most relevant in Ghana's Tier 3 voluntary scheme, where participation requires active enrolment, contribution rate choice, and fund selection. In Ghana, where only approximately 27% of adults can correctly answer basic financial literacy questions and retirement planning remains uncommon among informal workers (Sarpong-Kumankoma, 2023), financial capability represents a binding constraint on voluntary tier participation. Evidence strength: strong for the literacy-planning relationship; contextdependent for intervention effectiveness. Full operationalisation criteria, including the critical distinction between literacy and behavioural design mechanisms, are provided in Appendix A (Table A1, P8).

#### Policy Implications

The conceptual framework highlights pensions as multi-dimensional development instruments whose impacts depend on institutional design, administrative capacity, and governance quality. For Ghana, several policy priorities emerge from the framework and propositions.

##### 6.1 Expanding Coverage Among Informal Workers

With approximately 80% of Ghana's workforce in the informal sector (Ghana Statistical Service, 2024), expanding pension coverage requires fundamental redesign of administrative systems and contribution mechanisms. International evidence suggests several promising approaches: (1) simplified registration through mobile technology and digital identity systems (Hiilamo et al., 2020; World Bank, 2019); (2) flexible contribution schedules aligned with irregular income flows (Collins-Sowah et al., 2013; Adzawla et al., 2015); (3) reduced documentation requirements (Porisky et al., 2023); and (4) geographic expansion of payment infrastructure through mobile money platforms (Baah-Boateng & Vanek, 2020; World Bank, 2019). Recent reforms, including the SSNIT SEED programme and the Tier 3 voluntary scheme, represent important progress under Act 766, but implementation barriers among informal workers remain substantial (Kpessa, 2011a; Appiah, P.O., 2023).

##### 6.2 Strengthening Governance and Transparency

Public trust in pension systems requires transparent governance, effective regulation, and accountability mechanisms (Musalem & Ortiz, 2011; North, 1990). Policy priorities include: (1) strengthening the independence and capacity of pension regulatory authorities (Musalem & Ortiz, 2011; Holzmann & Hinz, 2005); (2) implementing real-time digital tracking of contributions and benefits (Enoff & McKinnon, 2011; Baah-Boateng & Vanek, 2020); (3) enhancing transparency through public reporting of investment returns, administrative costs, and benefit adequacy (Musalem & Ortiz, 2011); and (4) establishing credible grievance mechanisms for contribution and benefit disputes (Appiah, P.O., 2023; Enoff & McKinnon, 2011). These reforms can enhance legitimacy and encourage voluntary participation, particularly among sceptical informal workers (Collins-Sowah et al., 2013; Kpessa, 2011a).

##### 6.3 Integrating Contributory and Non-Contributory Components

Ghana's current system emphasises contributory mechanisms, limiting coverage among low-income informal workers who cannot afford regular contributions (Kpessa, 2011a; Collins-Sowah et al., 2013). International evidence demonstrates that hybrid systems combining contributory and non-contributory (social pension) components can achieve broader coverage while maintaining fiscal sustainability (Willmore, 2007; Galiani et al., 2016). A modest universal social pension, targeted at individuals aged 60+ without formal pension coverage (Holzmann & Hinz, 2005), could provide a foundation of income security while incentivising contributions to the formal system through benefit matching or progressive structures (Holzmann & Hinz, 2005).

#### 6.4 Enhancing Financial Literacy and Planning Capability

Low financial literacy constrains voluntary pension participation and contribution optimisation, particularly in the third tier (Sarpong-Kumankoma, 2023; Lusardi & Mitchell, 2011a). Evidencebased interventions include: (1) incorporating financial literacy and retirement planning into formal education curricula (Lusardi & Mitchell, 2011a; Sarpong-Kumankoma, 2023); (2) implementing targeted adult education programs focused on pension mechanisms and long-term planning (Klapper & Panos, 2011); (3) developing simplified decision aids and communication materials (Lusardi & Mitchell, 2011a; Enoff & McKinnon, 2011); and (4) leveraging behavioural insights to design default contribution rates and enrolment processes that align with optimal long-term saving (Thaler & Benartzi, 2004; Lusardi & Mitchell, 2011a).

#### 6.5 Monitoring and Evaluation Systems

Realising the developmental potential of pension reforms requires robust monitoring and evaluation systems capable of tracking coverage expansion, benefit adequacy, administrative efficiency, and welfare outcomes (Holzmann & Hinz, 2005; Musalem & Ortiz, 2011). Priority investments include: (1) integrated administrative data systems linking contributions, employment, and benefit receipt (Enoff & McKinnon, 2011; Appiah, P.O., 2023); (2) longitudinal surveys tracking pension participation, household welfare, health, and labour outcomes (Ardington et al., 2009; Cheng et al., 2018; Unnikrishnan & Imai, 2020); (3) rigorous impact evaluations of policy reforms (Case & Deaton, 1998; Galiani et al., 2016); and (4) regular assessments of financial sustainability under alternative demographic and economic scenarios (Holzmann & Hinz, 2005; Ghana Statistical Service, 2024; Kpessa-Whyte, 2018).

#### Conclusion

This paper reconceptualises pension systems in Ghana as development infrastructure with welfare impacts extending far beyond retirement income provision. By synthesising insights from more than 40 peer-reviewed studies and primary sources into a unified conceptual framework, the analysis advances a theory-driven understanding of how pension design, governance, and administrative capacity shape welfare, health, labour, and inclusion outcomes through identifiable causal mechanisms, conditioned by contextual moderators including labour market informality, state administrative capacity, demographic transition, and institutional quality. The framework integrates evidence from Sub-Saharan Africa, South Asia, East Asia, and Latin America alongside Ghana-specific institutional analysis grounded in the three-tier architecture established under the National Pensions Act, 2008 (Act 766) and its subsequent evolution through regulatory reform and digital innovation.

The framework makes three primary contributions to the literature. First, it provides an integrated theoretical structure connecting previously fragmented literatures on pension welfare effects, health outcomes, intrahousehold bargaining, labour supply transitions, intergenerational spillovers, administrative barriers, governance quality, and financial literacy within a single analytical architecture. Second, it explicitly incorporates Ghana's defining institutional conditions, an approximately 80% informal workforce, a rapidly ageing population projected to see the share aged 60 and above rise from 6.5% in 2021 to 10.8% by 2050, incomplete administrative infrastructure, and weak enforcement capacity, as moderators that condition system effectiveness rather than treating them as peripheral contextual notes. Third, the framework advances eight operationalised propositions differentiated by evidence strength and accompanied by explicit identification strategies, observable indicators, and comparison group specifications, generating a coherent and practically actionable empirical research agenda for Ghana and comparable low- and middle-income economies.

For Ghana, the framework identifies five priority reform areas with direct policy implications. Expanding coverage among informal workers, who constitute approximately 80% of the workforce, requires fundamental redesign of administrative systems through digitisation, simplified registration, mobile money contribution mechanisms, and flexible payment schedules aligned with irregular income flows. Strengthening governance through transparency, regulatory oversight, and accountability mechanisms, including real-time contribution tracking, public reporting of investment returns, and credible grievance redress, can enhance public trust and voluntary participation, particularly among informal workers who remain sceptical of institutional commitment. Integrating modest non-contributory social pension components with the existing contributory architecture may achieve broader coverage while maintaining fiscal sustainability, as demonstrated by international evidence that hybrid systems generate welfare gains without significant labour supply disincentives. Enhancing financial literacy and retirement planning capability, recognising that only approximately 27% of Ghanaians can correctly answer basic financial literacy questions, through targeted adult education, simplified decision aids, and behavioural design of default contribution structures can stimulate voluntary third-tier participation. Finally, robust monitoring and evaluation systems, encompassing integrated administrative data linking contributions, employment, and benefit receipt; longitudinal surveys tracking pension participation, household welfare, health, and labour outcomes; rigorous impact evaluations of policy reforms; and regular actuarial assessments under alternative demographic and economic scenarios, are essential for tracking outcomes and adapting policies based on evidence.

Five limitations of this study require transparent acknowledgement. First, as a conceptual rather than empirical study, the framework makes claims about causal mechanisms that have not been validated within Ghana's specific institutional context. The propositions advanced are theoretically grounded and empirically supported by evidence from comparable settings, but they cannot substitute for Ghana-specific causal identification. The framework should therefore be understood as a structured set of testable hypotheses rather than established findings, and readers should be cautious about inferring quantitative effect magnitudes from the international evidence base without adjustment for Ghana's distinctive conditions. Second, the purposive sampling approach, while appropriate for CFA methodology, carries an inherent risk of confirmation bias. Although the analysis explicitly sought disconfirming evidence and null findings, the selection of studies to include was ultimately guided by relevance judgements that may have prioritised positive-effect studies. Future iterations of this framework should consider systematic searches with explicit search strings, PRISMA-compliant reporting, and formal assessment of publication bias. Third, the transferability of evidence from South Africa, China, India, and South Korea to Ghana is limited by institutional, cultural, and economic differences that the framework acknowledges as contextual moderators but cannot fully quantify. The South African evidence base is particularly strong, but South Africa's non-contributory social pension differs fundamentally from Ghana's contributory SSNIT structure in both design and coverage depth, limiting direct inference. Fourth, the framework treats causal relationships as directional and predominantly static, whereas pension systems and their outcomes co-evolve dynamically. Coverage expansion may reduce informality; improved welfare outcomes may increase political support for contributory schemes; demographic change alters fiscal sustainability calculations that feed back into benefit adequacy decisions. These feedback loops and path dependencies are acknowledged in the framework's design but are not formally modelled. Future theoretical work should incorporate dynamic systems perspectives and formal causal loop diagramming. Fifth, the framework does not address distributional heterogeneity within Ghana's informal sector. Informal workers are not a homogeneous group: urban traders, rural subsistence farmers, seasonal agricultural workers, and home-based producers face different administrative barriers, income volatility profiles, and risk environments. Mechanisms and effect magnitudes are likely to vary substantially across these sub-populations, and policy recommendations calibrated to average informal sector workers may fail the most vulnerable sub-groups. Productive research directions to address these limitations include: rigorous impact evaluations

of SSNIT’s SEED programme and the Tier 3 voluntary scheme using regression discontinuity or difference-in-differences designs exploiting programme rollout timing; longitudinal household surveys tracking welfare, health, and labour supply effects of pension receipt among older Ghanaians, ideally linked to SSNIT administrative contribution records; comparative analyses across SubSaharan African pension systems to identify which contextual moderators drive heterogeneity in outcomes; formal dynamic modelling of feedback between pension coverage, informality, and fiscal sustainability under Ghana’s projected demographic trajectory; and qualitative political economy research on the institutional determinants of pension reform and regulatory independence in Ghana.

Ultimately, pension systems represent a critical and underutilised component of social protection architecture in developing economies. When designed with adequate coverage breadth, governed transparently, and implemented with administrative efficiency that reaches informal sector workers, they can simultaneously reduce poverty, improve health outcomes, enhance labour market transitions, strengthen intrahousehold bargaining and intergenerational welfare, and contribute to sustained development. Ghana’s ongoing demographic transition makes the urgency of this reform agenda unmistakable. The conceptual framework developed in this paper provides the theoretical foundation for the research and policy investments necessary to realise this potential, positioning Ghana’s pension system not as a narrow retirement mechanism for the formally employed minority, but as development infrastructure capable of generating welfare gains across generations and contributing to the inclusive, resilient growth that Ghana’s people and its development trajectory demand.

**Data Availability Statement**

This conceptual framework analysis synthesizes publicly available peer-reviewed literature. No primary data were collected or analysed for this study. The complete list of synthesized studies is provided in the references.

**Appendix A. Proposition Operationalisation Specifications**

Table A1 provides full operationalisation specifications for all eight research propositions, including observable indicators, comparison groups, recommended empirical identification strategies, and key threats to validity. These specifications supplement the evidence summaries presented in the main text and the abbreviated entries in Table 2.

**Table A1. Full operationalisation specifications for eight research propositions**

No.	Evidence strength and contexts	Observable indicators	Identification strategy	Key threats to validity
P1 Welfare	Strong (SA, China, India; RDD/DiD studies). Moderating condition: larger effects where recipient is sole earner.	GLSS per capita consumption; poverty headcount; asset index scores	RDD on SSNIT ageeligibility threshold; DiD with pensioner household panel	Selection into pension receipt; confounding from informal transfers; recall bias in consumption surveys
P2 Health	Moderate (China, S. Korea, SA). Restrict claims to utilisation and mental health, not broad physical health.	NHIS visit frequency; medication adherence; GHQ12 or PHQ-9 validated mental health instruments	Longitudinal survey; age-matched nonrecipient control; control for pre-existing health and household wealth	Selection on health status; attrition in longitudinal follow-up; heterogeneous NHIS access across regions
P3 Bargaining	Strong for female recipients (SA, China); untested for Ghana. Matrilineal/patrilineal structure is a key moderator.	Child HAZ/WAZ z-scores; school enrolment; validated intrahousehold bargaining scale; female selfreported decision authority	Gender-disaggregated DiD holding benefit amount and household size constant; heterogeneity by ethnic family structure	Cultural variation in bargaining norms across regions; coresidence endogeneity; measurement validity of bargaining scales
P4 Intergenerational	Strong (SA, China, India); moderate Ghana transferability. Critical: restrict to households where co-residence predates pension receipt.	Child labour participation; school enrolment and attendance rates; young adult employment and migration outcomes	DiD exploiting pension eligibility timing; restrict sample to pre-existing co-residence households	Endogenous coresidence selection; pension-income households may attract more coresidents, biasing spillover estimates
P5 Labour supply	Strong (SA); plausible but untested for Ghana. Key	Physical demand hours; validated	Time-use survey; compare formal sector	Selection into formal sector;
No.	Evidence strength and contexts	Observable indicators	Identification strategy	Key threats to validity
	outcome is occupational downgrade within informal sector, not exit.	occupational demand ratings; work intensity index; sector of employment	pensioners with informal workers approaching eligibility age	confounding from age-related health decline; inconsistent timeuse survey coverage
P6 Admin barriers	Moderate (Cambodia, multiple Africa). Three barrier dimensions: documentary, geographic, cost. SEED rollout = natural experiment.	Enrolment rate by district and sector; contribution regularity; coverage duration; distance to nearest registration point	DiD on SEED/mobile registration rollout timing; logistic regression of barrier dimensions on enrolment probability	Non-random rollout timing; confounding from regional economic conditions; spillover effects across districts
P7 Governance	Moderate (strong theory; limited causal ID). Separate into: reliability, transparency, and trust subdimensions.	Afrobarometer trust index; benefit processing time; investment return reporting; voluntary enrolment rate	Two-stage: governance perceptions predict enrolment; ITS on governance reform events (audit publication, tracking launch)	Reverse causality: low coverage may itself undermine governance legitimacy; survey trust measures may not predict behavior
P8 Financial capability	Context-dependent. Separate the literacy mechanism from the behavioural design mechanism (defaults, anchoring, reminders).	Tier 3 enrolment rate; contribution regularity at 6 and 12 months; financial literacy score pre/post intervention	RCT with three arms: literacy training; behavioural design (defaults/reminders); control. Follow-up at 6 and 12 months.	Hawthorne effects in RCT; attrition in informal sector sample; difficulty isolating literacy from income and social effects
Abbreviations: GLSS = Ghana Living Standards Survey; RDD = regression discontinuity design; DiD = difference-in-differences; ITS = interrupted time series; HAZ/WAZ = height/weight-for-age z-score; NHIS = National Health Insurance Scheme; SA = South Africa; RCT = randomised controlled trial.				

**Declaration of Competing Interests**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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