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Closing the Gender Income Security Gap for Older Adults in Low- and Middle-Income Countries

An Aging Readiness and Competitiveness 5.0 Methodology Note

Written by ECONOMIST IMPACT

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About this methodology note

AARP's Aging Readiness and Competitiveness (ARC) initiative aims to reshape perceptions of older adults' roles in communities, economies and societies. It is intended to prompt innovative action from governments, the private sector, civil society, philanthropy and other stakeholders to enable more independent, engaged and productive older populations.

This analysis, produced by Economist Impact with support from AARP, is the fifth iteration of the ARC initiative (ARC 5.0) and a follow-up to our previous analysis (ARC 4.0), launched in 2023. ARC 4.0 explored the challenges and opportunities accompanying global aging in low- and middle-income countries (LMICs) and identified innovative solutions and leading practices that contribute to equitable and healthy aging. The brief builds on the qualitative exploration of ARC 4.0 and provides quantitative insights into the drivers of healthy longevity and the societal impacts of social pensions—the most prevalent policy intervention used to promote income security for older persons in LMICs. ARC 5.0 also delves deeper into the root causes of the gender gap in healthy aging, analyses existing interventions to bridge it, and identifies areas for further action to ensure older women in particular can lead longer and healthier lives.

Our goal is that the insights brief, supported by this methodology note, will become useful tools for policymakers, practitioners and other sectoral leaders who seek to balance competing development priorities. It is also designed to promote effective and innovative programmes and spur investments that support healthy aging and tackle gender-based disparities in aging.

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About the cover: The illustration highlights the complex interplay between economic status, life expectancy and gender disparities among older adults globally. On the left, we see fewer men, with more money and with a heavier scale due to lower life expectancy. On the right, we see more women, representing women living longer than men, with less money. Despite this longer life expectancy, women are economically outweighed by men. The snake wrapped around the middle of the scale references a medical symbol (Rod of Asclepius) and attempts to link gender disparities in healthy life expectancy (healthspan) with economic status.

Disclaimer: The views expressed in this methodology note may not necessarily reflect those of AARP.

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Methodology overview

To guide policymakers who are aiming to implement aging-friendly policy and promote gender equity among older people—and specifically address the gender-income gap—Economist Impact developed a set of three novel quantitative models. These explore the key determinants of healthy longevity and examine the micro and macroeconomic impacts of social pensions—one of the most common methods of delivering income security to aging populations.

Model 1: The drivers of healthy life expectancy (HALE) at 60 model is an econometric model that measures the relationship between country-level socio-economic, demographic and health factors on HALE at age 60 globally. HALE at age 60 is an essential metric for assessing healthy longevity, as it reflects the number of years adults can expect to live in good health from age 60 onwards. By measuring its key drivers, we provide further understanding of the policies and investments that have helped to extend healthy life spans around the world. We used a multivariable linear regression model to examine the various drivers of HALE at age 60.

Model 2: The social pensions impact model quantifies the microeconomic impacts of social pensions[i] on older adults. A literature review gathered evidence to establish the health, social and economic outcomes of social pensions in low- and middle-income countries (LMICs). This first-of-its-kind analysis aggregates the results of these impact assessments and evaluates the directionality of the evidence.

Model 3: The Old-Age Grant (OAG) impact model quantifies macroeconomic impacts and return on investment for South Africa's pioneering OAG, estimating the OAG's impact on the country's gross domestic product (GDP) between 2017 and 2023. The model uses a demand-side equation to identify impacts on individual GDP components in two counterfactual scenarios where retracted OAG funds are reallocated (assuming the absence of the OAG).

[i] The social pensions impact model analysed studies that looked at the impacts of social (non-contributory) pensions on older adults. The search strategy recognised and included alternative names for social pensions, such as unconditional cash transfers, income transfers, non-contributory pension schemes, old-age benefits, older persons' allowances, social assistance, social pensions and so on.

Model 1: Drivers of healthy life expectancy at age 60

Model objectives

This model examined the relationship between country-level socio-economic, demographic and health factors on HALE at age 60 using an econometric model with a multi-variable, cross-sectional, linear regression approach. The model tested for the following key predictors of HALE: GDP per capita, mean years of schooling, fertility rates and current health expenditure.

Model assumptions

For the purposes of this model, all explanatory variables were treated as having a linear relationship with HALE at age 60:[1-6]

- Logged GDP per capita is an indicator of individual income level and is expected to have a direct relationship with HALE at age 60. An increase in income is associated with an increase in HALE at age 60.
- Mean years of schooling represents education level and is expected to have a direct relationship with HALE at age 60. An increase in mean years of schooling is associated with an increase in HALE at age 60.
- Fertility rate is expected to have an inverse relationship with HALE at age 60. An increase in the fertility rate is associated with a decrease in HALE at age 60.
- Current health expenditure is expected to have a direct relationship with HALE at age 60. An increase in current health expenditure is associated with an increase in HALE at age 60.

Variables and data

Table 1 presents the variables used in Model 1.

Table 1. Model 1 variable descriptions

Variable (units)		Definition	Frequency	Availability	Source
Dependent variable					
Y	HALE, at age 60, male and female (years)	HALE is the average number of years in full health that a person (usually at age 60) can expect to live based on current rates of ill health and mortality.	Annual	2000, 2010, 2015, 2019	World Health Organization (WHO)
Independent variables					
X1	Logged GDP per capita, purchasing power parity (PPP) (constant 2017 international dollars)	GDP is gross domestic product converted to international dollars using PPP rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at the purchaser's prices is the sum of gross value added by all resident producers in the country, plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or the depletion and degradation of natural resources. Data are in constant 2017 international dollars.	Annual	2000-2022	World Development Indicators, Data bank
X2	Mean years of schooling	Mean years of schooling for adults aged 25 and above reflects levels of education in a society.	Annual	2000-2021	Global Development Lab
X3	Fertility rate, total (births per woman)	The total fertility rate represents the number of children who would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates from the specified year.	Annual	2000-2021	World Development Indicators, Data bank
X4	Current health expenditure per capita in U.S. dollars	This is per capita current health expenditure, expressed in U.S. dollars.	Annual	2000-2019	WHO

The regression equation

$$Y = C + \beta 1 \ln \times 1 + \beta 2 \times 2 + \beta 3 \times 3 + \beta 4 \times 4 + \mu i$$

Model specifications

- A balanced panel data set was created for 172 countries, using annual data from 2000 to 2019.
  - Low-income countries = 20
  - Lower middle-income countries = 53
  - Upper middle-income countries = 45
  - High-income countries = 54
- Data for the dependent variable—HALE at age 60—were discontinuous and were only available for the years 2000, 2010, 2015 and 2019. To account for differences in data availability across years and variables, we ran the model for the years 2000 to 2019.
- We used a country fixed-effects approach to account for time-invariant, country-level differences. Given the cross-sectional and historical structure of the available data, and that only four time periods were available for the key outcome variable, a panel data approach was chosen.
- Control variables were introduced to account for factors other than income that are predictors of the dependent variable (HALE at age 60).
- The model used natural log transformation for the income variable (GDP per capita).

- The estimated model coefficients were used to study the direction and magnitude of the relationship between healthy life expectancy and its predictors.

Three variations of regression models were tested for results. These differed in terms of input data:

- **Modelling the complete data set:** Data for all 172 countries and for all available years were used to run the first regression model. Results from this regression model gave us a broad indicator of the direction and strength of the relationship between variables at a global level.
- **Income-based modelling:** Using data on income classification, we ran different iterations of the model for each income level: high income, middle income and low income. Results from this regression model gave us a sense of how the relationship between variables varied among countries with different income levels.
- **Time-based modelling:** Data for the dependent variable were discontinuous and were only available for the following years: 2000, 2010, 2015 and 2019. To study the evolution of the relationship between HALE and its predictors, we ran separate regressions for each of those four years. The results from this regression model showed us how the relationship between variables evolved over time at a global level.

Summary of model results

Regression results suggest that GDP per capita and total fertility rate were the primary influencers of HALE, though the degree of impact shifted over the years included in our analysis.

- GDP per capita has a strong and significant impact on HALE at 60.
- The impact of GDP per capita on HALE at age 60 rose consistently between 2000 and 2019, while the impact of the total fertility rate declined over this period.

The strength of the coefficients also differed by income level:

- GDP per capita had a larger impact on HALE at age 60 among high-income countries than LMICs.
- The total fertility rate had a larger impact on HALE at age 60 among LMICs than high-income countries.

Model outputs provided a generalized view of the impact of socio-economic and demographic factors on HALE at age 60. These results are best used to understand the broad relationship between input and output variables, rather than to generate knowledge on the directionality of relationships or causality.

Table 2. Model 1 results

Countries	Model specification	Log GDP per capita	Current health expenditure	Total fertility rate	Mean years of schooling	Adjusted Rsquared
All	HALE 60 men and women 2000-2019, with country fixed effects	0.8675***	0.0003***	-0.1764**	0.2756***	96%
All	HALE 60 women 2000- 2019, with country fixed effects	0.9356***	0.0002***	-0.1322*	0.2882***	96%
All	HALE 60 men 2000-2019, with country fixed effects	0.7563***	0.0004***	-0.2032**	0.2623***	95%
All	HALE 60 men and women 2000	0.4111*	0.0009***	-0.6305***	-0.0934	59%
All	HALE 60 men and women 2010	0.6384**	0.0005***	-0.5091***	-0.0422	62%
All	HALE 60 men and women 2015	0.7162***	0.0004***	-0.567***	-0.0433	65%
All	HALE 60 men and women 2019	0.7464**	0.0004***	-0.5025**	-0.019	66%
High income	HALE 60 men and women 2000-2019, with country fixed effects	1.6258***	0.0002***	-0.2201	0.4624***	96%
Middle income	HALE 60 men and women 2000-2019, with country fixed effects	0.7401***	0.0011**	0.0338	0.1596**	94%
Low income	HALE 60 men and women 2000-2019, with country fixed effects	0.4061	-0.0041	-0.5317**	0.4003*	76%

* indicates *p*-value<0.05
**indicates *p*-value<0.01
*** indicates *p*-value <0.001

Source: Economist Impact calculations

Model limitations

The key limitation was the availability of data. Variable selection was guided solely by the availability of standardized and comparable data.

While many alternative variables and additional predictors exist, they typically lack the required historical time series or geographic spread needed to build a panel data set.

Model 2: Social pensions impact model

Model objectives

This model studied the microeconomic impacts of social pensions using a meta-analysis framework. Meta-analysis is a research method that systematically combines study data from several selected studies to develop a single conclusion. A literature review was conducted to gather evidence on the health, social and economic outcomes of social pensions in LMICs. Adopting a meta-analysis approach allowed us to aggregate outcomes from this existing research.

While we originally hoped to standardize and pool effect sizes for a formal quantitative meta-analysis, we did not find enough studies using standard methodologies and measures to proceed with this plan. Instead, we evaluated the direction of effect sizes within selected studies, individually and in aggregate, to derive learnings related to the economic, health and social impacts of social pensions.

Model specifications[ii]

Protocol selection. A simplified version of the Cochrane Protocol was used to design the analysis approach.

PICO framework.[iii] A PICO (population, intervention, comparison, outcomes) framework was used to frame research questions while designing the study.

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Search strategy. A detailed search strategy was developed based on the PICO framework presented in Table 3. The key parameters of our search strategy are detailed in Table 4.

Literature review. An information specialist was engaged to conduct an extensive literature review, searching 17 databases including Medline, PubMed, CINAHL, Embase, Web of Science, ProQuest, Google Scholar, and others, as well as grey literature. The search yielded 3,873 results.[iv]

Study selection. The 3,873 search results were put through a two-stage filtering process. At each stage, two researchers independently reviewed the studies.

Table 3. PICO framework for this study

Population	Older adults aged 55 and above A list of commonly used terms for this population subset was created.
Intervention	Social pensions A list of commonly used terms for this intervention was created.
Comparison	None This refers to the control group or condition to which outcomes are compared. In this case, we were not making any comparisons. Instead, we focused on the absolute impact of the intervention.
Outcomes	A range of economic, health and social outcomes for the population being studied (detailed below)

Table 4. Search parameters for the literature

Geography	LMICs
Time period	2000 onwards
Study design	Randomized controlled trials and quasi-randomized trials

Table 5. Study selection

Stage 1, abstract screening	In this first stage, irrelevant and duplicate studies were excluded based on their titles and abstracts. This was done by two researchers working independently. Inconsistencies in classification were resolved through discussion until consensus was reached, resulting in a set of 79 studies.
Stage 2, full-text screening	In this second stage, full texts of the 79 shortlisted studies were evaluated for quality based on participant selection, experiment design and risk of bias. This process yielded a total of 21 studies for the final stage of data extraction.

[ii] See the appendix for further search details.
[iii] See the appendix for the detailed PICO framework.
[iv] See the appendix for a full list of databases.

Data extraction. The final 21 studies were analysed in depth to extract the relevant data, which were then organised into a standardised code sheet. A coding format was created to capture specific information from each study (see Table 6).

Selecting outcomes. All outcome measures were classified into three categories: economic outcomes, health outcomes and social outcomes. Outcomes for which data were extracted are presented in Table 8. For each outcome, results were extracted and identified as sex disaggregated or sex aggregated, depending on the data available. For studies with multiple outcomes, each outcome was treated independently and analysed for relevance to our study's objectives. Only outcomes relevant to our study's objectives were retained for further processing.

Finalizing results. For all selected outcomes, results were prepared by studying both the effect size and the direction of the effect.

- **Effect size:** An effect size is a raw number that quantifies an outcome measure. For example, a 1% increase in consumption expenditure resulting from a social pension translates to a 1% effect size.
- **Effect direction:** The direction of effect describes whether outcomes from an intervention are positive, negative, insignificant or mixed for participants (see Table 7). The direction does not necessarily reflect the sign of the estimated coefficient. Take, for instance, a 1% increase in consumption expenditure resulting from a social pension. The direction of the benefit here is positive, as the increase in consumption expenditure suggests a positive benefit for the population being studied. A one-point decline in a depression score would also be a positive benefit, as lower levels of depression represent a positive outcome for study participants. Effect direction can be used as a standardised metric to encompass a wide variety of data in systematic reviews in which standardised effect sizes cannot be obtained for all studies, or where there are too few studies for a particular outcome.

Effect direction using sex-disaggregated data. Some studies report outcomes disaggregated by sex. In cases where outcomes are reported only by sex and not for the total population, the overall effect direction is a function of the direction of effect for each sex. In cases where outcomes are reported by sex and aggregated by sex, the overall direction of effect is a function of all three effects.

Table 6. Meta-analysis coding format for selected studies

Key identifiers	Study ID, title, year of publication and authors
Outcomes	Outcome measures and detailed description
Results	• Effect direction, raw effect size and standard error • Calculations for P-values, Cohen's d and confidence interval

Table 7. Meta-analysis effect direction interpretations

Effect direction	Interpretation
Positive	Evidence indicates that the intervention led to an improvement in outcomes for study participants.
Negative	Evidence indicates that the intervention led to a deterioration in outcomes for study participants.
Insignificant	Evidence indicates that the intervention led to no change in outcomes for study participants.
Mixed results	Evidence indicates that the intervention led to mixed outcomes (both positive and negative) for study participants.

Table 8. List of relevant outcomes found in the 21 studies used for the meta-analysis

Economic outcomes	
Assets	
• Log of assets, index (real and positive)	
Consumption expenditure	
• Consumption per adult equivalent (real and positive)	• Log of monthly per capita expenditure (real)
• Consumption on food per adult equivalent (real and positive)	• Log of monthly per capita expenditure on food (real)
• Consumption on non-food per adult equivalent (real and positive)	• Log of monthly per capita expenditure on non-food (real)
• Log of monthly per capita education expenditure (real)	• Log of monthly per capita medical expenditure (real)
Income	
• Income level (ordinal, + = "higher")	• Individual labor income (real and positive)
• Income per adult equivalent excluding senior (real and positive)	• Log of monthly household income excluding benefit (real)
• Income per adult equivalent including senior (real and positive)	• Total monthly household income (real and positive)
Labor force participation (LFP)	
• Hours worked (real and positive)	• LFP (binary, "working")
• Hours worked in market-oriented activities (real and positive)	• LFP in market-oriented activities (binary, "working")
• Hours worked in non-paid work (real and positive)	• LFP in non-paid work (binary, "working")
• Hours worked in paid work (real and positive)	• LFP in paid work (binary, "working")
Poverty	
• Income below the extreme poverty line (binary, "below")	• Self-reported financial well-being (binary, "having at least a little money to meet basic needs")
• Income below the poverty line (binary, "below")	
Savings	
• Has savings (binary, "saves")	
• Total household savings (real and positive)	
Health outcomes	
Alcohol consumption	
• Average number of alcoholic drinks consumed per month (natural)	
• Currently drinks (binary, "drinks")	
Disability	
• Disability (binary, "disabled")	
• Number of activities of daily living (ADLs) that the individual has difficulties performing (natural)	• Number of instrumental ADLs (IADLs) that the individual has difficulties performing (natural)
Food security	
• Food insecurity (natural, + = "insecure")	• Having eaten "less" or "much less" in the last 3 months (binary, "less/much less")
• Food insecurity (ordinal, + = "insecure")	• Haemoglobin level (binary, "anaemia")
• Frequency of nights that household members slept hungry (binary, "sometimes")	• Log of glycated haemoglobin HbA1C, % × 10^2 (real and positive)
• Frequency of whole days without eating (binary, "sometimes")	
Healthcare use	
• Had dental, ophthalmological or optometric care or vaccination in the previous 3 months (binary, "had")	• Health insurance (binary, "insured")
• Had primary care visit in the previous month (binary, "had")	• Number of doctor visits (natural)
• Had visit, medication or exam in the previous month (binary, "had")	• Used healthcare services (binary, "used")
• Healthcare use (natural, + = "more utilisation")	• Was hospitalised or had surgery in the previous 12 months (binary, "hospitalised/had surgery")
Mental health	
• Delayed word recall (natural, + = "better")	• Depression, survey (binary, "depressed")
• Depression, CES (binary, "depressed")	• Depression, survey (natural, + = "worse")
• Depression, GDS (binary)	• Immediate word recall (natural)
• Depression, GDS (natural)	• Memory, tasks performed (%)
Physical health	
• Body mass index, kg/m^2 (real and positive)	• Hypertension (binary, "hypertense")
• C-reactive protein, mg/dl (real and positive)	• Number of diagnosed diseases (natural)
• Cholesterol, mg/dl (real and positive)	• Systolic blood pressure, mm/Hg (real and positive)
• Diastolic blood pressure, mm/Hg (real and positive)	• Triglycerides, mg/dl (real and positive)
• Grip strength (real and positive)	• Waist circumference, cm (real and positive)
• High-density lipoprotein, mg/dl (real and positive)	• Walking speed (real and positive)

Table 8. List of relevant outcomes found in the 21 studies used for the meta-analysis (cont.)

Health outcomes(cont.)	
Subjective well-being	
• Happiness (binary, "happy") • Loneliness (binary, "lonely") • Quality of life (QoL) satisfaction (%) • QoL satisfaction (binary, "satisfied") • QoL satisfaction (ordinal, + = "better") • QoL satisfaction (natural)	• QoL satisfaction (real and positive) • QoL satisfaction, summary index (%) • Sadness (binary, "sad") • Satisfied with the family (binary, "satisfied") • Self-worth (%)
Tobacco consumption	
Social outcomes	
Empowerment	
• Contribution to household expenditure (binary, "contributes") • Empowerment, index (%)	• Participation in economic household decisions (binary, "participates") • Participation in non-economic household decisions (binary, "participates")
Social participation	
• Meets regularly with friends or family (binary, "meets")	

Table 9. Final list of studies included in the *social pensions impact model*

Study #	Study title
1	Association between social pensions with depression, social, and health behaviors among poor older individuals in Colombia[7]
2	Depressive symptoms and receipt of pensions: a cross-sectional analysis of the ELSI-Brazil study[8]
3	Does the old-age pension scheme improve household welfare? Evidence from India[9]
4	Educational inequalities in disability linked to social security coverage among older individuals in five Latin American countries[10]
5	Essays on India's Old Age Pension Program: Politics, Welfare Effects and Gender[11]
6	Favourable changes in economic well-being and self-rated health among the elderly[12]
7	Food well-being in older adults: effects of a universal non-contributory pension in Mexico[13]
8	Households with elderly members in Mexico: can pensions or a demogrant help facing food insecurity?[14]
9	Impact of the Non Contributory Social Pension Program 70 y más on Older Adults Mental Well Being[15]
10	Minimum eligibility age for social pensions and household poverty: Evidence from Mexico[16]
11	Non-contributory pensions[17]
12	Old-age pensions in a lower middle-income country: Economic or psychological effects?[18]
13	Pension exposure and health: Evidence from a longitudinal study in South Africa[19]
14	Pensions, consumption and health: evidence from rural South Africa[20]
15	Policy shift: South Africa's old age pensions' influence on perceived quality of life[21]
16	Short-term impact of income on cognitive function: evidence from a sample of Mexican older adults[22]
17	Targeting cash transfers on the "poorest of the poor" in the slums: how well did the Kenya's older persons cash transfer programme perform?[23]
18	The effects of non-contributory pensions on material and subjective well being[24]
19	The impact of old age pension eligibility on alcohol consumption: Evidence from a population-based study in rural South Africa[25]
20	The Well-being Effects of an Old-Age Pension: Experimental Evidence for Ekiti State in Nigeria[26]
21	Women's autonomy and old age pension transfer in South Africa[27]

Summary of model results

While we originally hoped to standardize and pool effect sizes for a formal quantitative meta-analysis, we did not find enough studies using standard methodologies and measures to proceed with this plan. Instead, we evaluated the direction of effect sizes within selected studies, individually and in aggregate, to derive learnings related to the economic, health and social impacts of social pensions.

Results suggest that the majority of impact analyses found positive or insignificant results. For instance, all studies assessing assets, labor force participation, poverty rates and food security found positive impacts of social pensions on older adults. Social pensions also appeared to improve mental health, self-rated health, subjective well-being and healthcare use, with all results either positive or insignificant.

Model limitations

Limited number of studies. The biggest challenge we faced in conducting this meta-analysis was the limited number of studies that met our research criteria. Despite maintaining a broad search strategy, covering 71 countries across a 25-year period, the total number of studies available for final data extraction was relatively small. This highlights a need to devote greater attention and resources to evaluating outcomes for older adults across countries.

Effect sizes. The limited number of studies posed a further challenge to our analysis. For most of the outcome measures, there were not enough studies from which data could be parsed to create standardised effect sizes with a reasonable level of confidence. The largest number of studies for any outcome was nine (mental health). Several outcomes had only one study for data extraction. This prevented us from carrying out a formal quantitative meta-analysis as originally intended.

Model 3: Old-Age Grant impact model

Model objectives

This model studied the macroeconomic impacts of social pensions in South Africa. We used the demand-side equation to identify impacts on individual GDP components in two counterfactual scenarios–assuming the absence of the OAG–from 2017 to 2023.

Model specifications

- OAG benefits are direct transfers from the government to beneficiaries and are classified as non-consumption government expenditure. Government transfers are not included in nominal GDP, but private consumption and investment resulting from these transfers are counted in GDP calculations.
- Changes in nominal gross fixed investment are channeled only by changes in the incomes of consumers driven by the retraction of OAG benefits. The portion of nominal gross fixed investment that comes from the government is assumed to remain unchanged historically.
- Grant income from the OAG is income for recipients. Among grant recipient households, we assumed a consumption to savings ratio of 70:30.
- Additional personal income from the OAG drives an increase in personal consumption and savings through the multiplier effect.[v,28]
    - The additional savings are the portion of additional income not spent on private consumption. We assumed 20% of these private savings are invested by consumers in capital markets, leading to increases in nominal gross fixed investment. The same ripple effect that impacts consumption creates two rounds of savings-investments.
- The above information was used to calculate the **government transfer multiplier**, which is the change in private consumption and investment resulting from government transfers (in this case, OAG benefits).
- In the absence of the OAG, we assumed that there would be direct and indirect impacts on individual components of GDP, mainly private consumption, government consumption and fixed investment.
    - Based on evidence from the literature, we expected a decline in household income in the absence of OAG benefits.[29]
    - Private consumption was expected to be lower, based on the assumption that total income would be lower.[30]
    - Gross fixed investment is also expected to be lower under the assumption that total income is now lower.
    - Government consumption expenditure was expected to be higher in the scenario where OAG funds were reallocated to other government spending in line with historical proportions. This reallocation was expected to drive increases in private consumption. For this assumption, we used the **government spending multiplier**, which is the change in private consumption resulting from a change in government consumption expenditure.
- We expected no changes in exports and imports.
- Average monthly wages and tax rate levels remained unchanged.

[v] The consumption multiplier effect is a phenomenon where a change in private consumption spending results in a more than proportionate change in overall economic output. The initial change in spending, possibly resulting from an increase in income, leads to a ripple effect of increased economic activity, as each round of spending generates income for others.[7]

Table 10. Old-Age Grant impact model: Baseline and counterfactual scenarios

Baseline scenario: GDP with OAG • The baseline scenario reflects the actual situation between 2017 and 2023, with the OAG in operation. • Historical data for GDP and its components were taken from Economist Intelligence.

Counterfactual scenarios: GDP without OAG
• Our counterfactual scenarios assumed that the OAG was not in operation between 2017 and 2023.
• Estimates for GDP and its components were modelled using the demand-side equation model.
• There were two counterfactual scenarios for the reallocation of retracted OAG funds:
  ○ Scenario 1: Retracted OAG funds were invested in the economy by the government
  ○ Scenario 2: Retracted OAG funds were allocated to other government spending (in line with historical spending trends)

Variables and data

Variables used in the OAG impact model are presented in Table 11.

Table 11. Old-Age Grant impact model, variable descriptions

Variable (units)	Definition	Frequency	Availability	Source
Total expenditure on the OAG (ZAR)	HALE is the average number of years in full health that a person (usually at age 60) can expect to live based on current rates of ill health and mortality.	Annual	2000, 2010, 2015, 2019	World Health Organization (WHO)
Total beneficiaries (persons)	Total number of people in receipt of the OAG in South Africa	Annual	2017-2023	National Treasury, South Africa
Nominal GDP (ZAR)	GDP at current market prices in ZAR	Annual	1988-2021	South African Reserve Bank; Economist Intelligence
Nominal private consumption (ZAR)	Private consumption expenditure at current market prices in U.S. dollars	Annual	1988-2022	South African Reserve Bank; Economist Intelligence
Nominal government consumption expenditure (ZAR)	Government consumption expenditure at current market prices in U.S. dollars	Annual	1990-2022	South African Reserve Bank; Economist Intelligence
Gross fixed investment (ZAR)	Gross fixed investment expenditure at current market prices in U.S. dollars	Annual	1990-2022	South African Reserve Bank; Economist Intelligence
Marginal propensity to consume (%)	The portion of an additional unit of income that is likely to be spent on consumption	Annual	1990-2030	Economist Intelligence calculations
Other components, GDP (ZAR)	Exports - imports + stock building	Annual	1990-2022	South African Reserve Bank; Economist Intelligence

* ZAR = South African Rand

Source: Economist Impact

Model specifications

The demand-side GDP equation

Y = C + I + G + (X-M) + Stock Building

Where,
C = nominal private consumption
I = nominal gross fixed investment
G = nominal consumption government expenditure
X = nominal exports of goods and services
M = nominal imports of goods and services

Transfers

Government transfer multiplier:

Δ Nominal GDP/Δ Government transfers = (Δ private consumption + Δ investment)/Δ government transfers

Government spending multiplier:

Δ Nominal GDP/Δ Government consumption =
(Δ private consumption + Δ government consumption)/Δ government consumption

We estimated changes to some of the above GDP components to calculate the net impact on GDP. The underlying assumption was that reduced income would affect consumption, investment and government spending. Changes take into estimated government transfer and government spending multipliers (see above).

Government transfer multiplier calculation methodology. The government transfer multiplier was calculated as the sum of the private consumption and investment multipliers. These component multipliers were calculated by considering two "ripples", or forward multiplier effects resulting from the initial increase in private consumption and investment due to disbursement of OAG funds. Estimates were also compared to existing literature detailing government transfer multipliers in different countries based on national factors and considerations such as the hand-to-mouth ratio for transfer recipients.[31-33] Regarding multipliers, "consumption" refers to private consumption and not government consumption expenditure, unless otherwise specified.

Consumption Multiplier. The consumption multiplier was calculated as the sum of the initial disposable OAG fund, a first ripple, and the second ripple. The calculations for these components were as follows:

- **Initial disposable OAG fund:** Total OAG funds minus the estimated taxed and saved amounts.
- **First Ripple:** The remaining amount from the initially disbursed OAG fund after estimated taxation and savings.
- **Second Ripple:** The remaining amount from the first ripple after estimated taxation and savings.

Investment Multiplier. Similarly, the investment multiplier is calculated as the sum of the initial push of the disposable OAG fund, along with the subsequent ripples generated from the income left after taxation and savings, depending on the investment rate.

Government spending multiplier calculation method. The value for the government spending multiplier was estimated by studying available literature, and set at .4.[vi, 34-36]

[vi] Based on existing literature, this value is likely on the higher end.[13-15]

GDP components:

Changes to exports and imports. We did not expect any significant changes to exports and imports.

Changes to nominal government expenditure. Government expenditure has two components: government consumption expenditure and non-consumption government expenditure.[vii] In both counterfactual scenarios, non-consumption government expenditure (the OAG) was reallocated to government consumption expenditure, either in part or whole (reinvested in the economy by the government or reallocated to other government spending in line with historical trends, depending on the scenario).

Changes to nominal private consumption. The reallocation of non-consumption government expenditure to government consumption expenditure was expected to have an impact on nominal private consumption, owing to the multiplier effect of the transfers. The net impact on private consumption is the sum of two opposing effects: (a) reduced consumption due to the income effect; and (b) increased consumption resulting from an increase in government consumption expenditure, owing to the multiplier effect from government spending The net impact on nominal private consumption expenditure was expected to be negative, with reduced income resulting in a net decline in overall consumption expenditure (despite the multiplier effect of increased consumption due to the reallocation of expenditure to other government spending).

Changes to nominal gross fixed investment. Under both counterfactual scenarios, the gross fixed investment is decreasing due to the reduced savings resulting from the lack of the OAG transfer funds.

Changes to nominal GDP. We calculated the net impact of the revised GDP components discussed above. The resulting figures provided nominal GDP forecasts for each counterfactual scenario.

Summary of model results

Based on the literature and our calculations, we estimated that every rand spent on the OAG yielded just under 1.4 rand back to the South African economy.[31-33] Our model found that the OAG yielded higher GDP growth rates than the two counterfactual scenarios, where OAG funds were instead reinvested in the economy by the government or reallocated to consumption expenditures. Specifically, we found that GDP growth rates would have been lower for four of the six years under consideration (with the exceptions of 2020 and 2021).

This means that we estimate South Africa's economy would have been smaller in the absence of the OAG, even with equivalent volumes of government spending. These results are due in large part to the high rates of poverty experienced by many of the recipients, as well as the low return on government spending in many of South Africa's other areas of expenditure, as suggested by existing evidence.

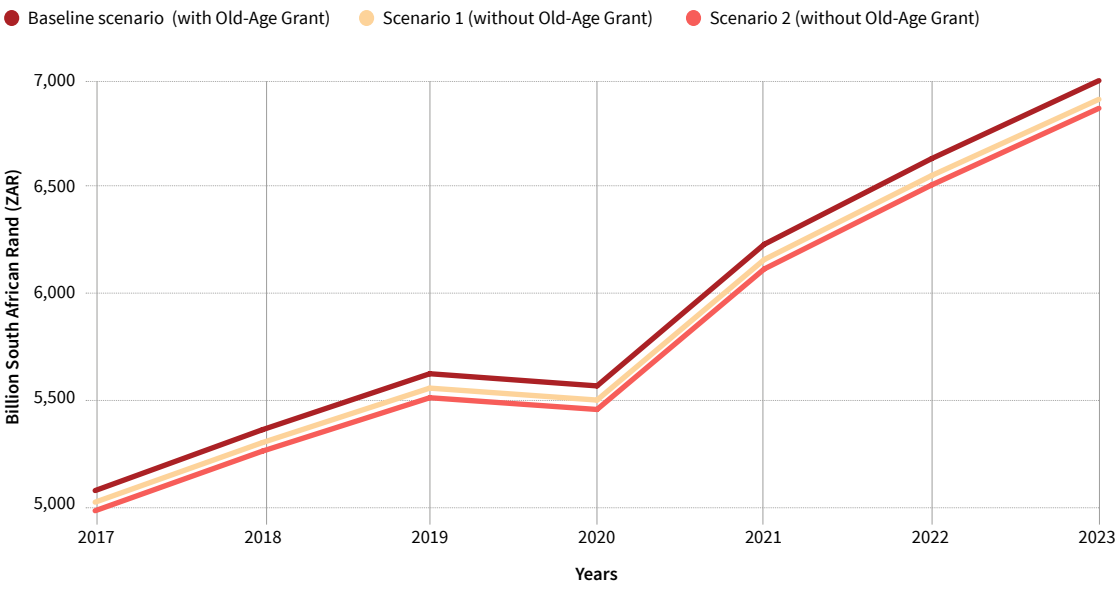
[vii] Government consumption expenditure is any expenditure on a purchase of goods or services in the domestic or international market. The government is a consumer of goods and services when it participates in market activities. Consumption expenditure includes most expenditures for purchases of goods and services, such as compensation of employees or expenditure on national defence and security. Non-consumption government expenditure is any type of expenditure other than government consumption, such as transfers, subsidies and so on. Non-consumption government expenditure includes expenditure on grants, social welfare spending and debt interest payments, among other things. OAG expenditure is classified as a non-consumption government expenditure.

Table 12. Old-Age Grant impact model, summary results

	Baseline scenario (with OAG)		Counterfactual scenarios (without OAG)			
	Nominal GDP (bn ZAR)	GDP growth rate (%)	Scenario 1: Retracted OAG funds are invested into the economy by the government		Scenario 2: Retracted OAG funds are reallocated to other government spending in line with historical proportions	
			Nominal GDP (bn ZAR)	GDP growth rate (%)	Nominal GDP (bn ZAR)	GDP growth rate (%)
2017	5,078		5,018		5,024	
2018	5,363	5.61%	5,297	5.56%	5,303	5.56%
2019	5,625	4.89%	5,547	4.74%	5,558	4.8%
2020	5,568	-1.02%	5,492	-0.99%	5,502	-0.99%
2021	6,231	11.9%	6,150	11.98%	6,160	11.95%
2022	6,632	6.44%	6,543	6.39%	6,553	6.38%
2023	6,997	5.51%	6,902	5.48%	6,910	5.45%

Source: Economist Impact

Figure 1: Nominal GDP with and without the OAG



Source: Economist Impact calculations

Model limitations

The model methodology makes reasonable assumptions regarding the consumption and savings behaviour of OAG recipients in the South African economy. However, there are limitations to the model. It does not account for the consequent impact of a change in income levels on the labor market, nor does it account for the tax revenue implications of forecasted changes in consumption.

Labor and trade market effects. This is a domestic demand national income accounting model and therefore does not model prices, inflation and wages, which could have impacts on labor and trade markets. The model does not account for changes observed in the labor market or the trade market in the counterfactual scenarios. We assume foreign trade remains unchanged. The model accounts for the direct impacts of income reduction on private consumption, but not for the impacts of this decline in income on the household labor supply decisions of other working-age individuals in the same household. There is evidence in the literature on intra-household sharing of OAG benefits, and in many instances, OAG availability plays a role in shaping labor supply and migration decisions among younger family members.

Other impacts. The literature on OAG benefits suggests that intra-household sharing of the benefits can have positive impacts on indirect beneficiaries in the same household, particularly school-age children. Older women have been known to use OAG benefits to support their grandchildren's education and to supplement their food consumption. These benefits are likely to improve the educational outcomes and future earning potential of these children. The model does not currently account for the impacts of potentially reduced health and education among children in the counterfactual scenarios.

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Appendix: Social pensions impact model search record

A1. Detailed scope for search (PICO)

Population

- Older adults (inclusive of all genders)
- Ages 55 or above
- Living in a low- or middle-income country (LMIC)

Intervention

Social pensions in LMICs including (but not limited to)

- Unconditional cash transfers
- Income transfers
- Social assistance
- Non-contributory pension schemes
- Social pensions
- Older person's allowances
- Older person's social allowances
- Old-age benefits

Comparator

Not applicable

Outcomes

- Impact on economic status (for example, poverty rates, individual status, family status, labor force participation rates)
- Impact on health status (for example, access to healthcare services, rates of adverse mental health conditions, food security, nutritional status, death rates)
- Subjective well-being (for example, happiness, feeling valued and respected, participation in household decision-making, feelings of empowerment)

Other limits

- Date of publication: Publications from 2000 to the present day
- Geographic focus: LMICs, specifically Albania, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus, Belize, Bolivia, Botswana, Brazil, Bulgaria, Cape Verde, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, El Salvador, Eswatini, Fiji, Georgia, Guatemala, India, Indonesia, Iraq, Jamaica, Kazakhstan, Kenya, Kiribati, Kosovo, Kyrgyz Republic, Lesotho, Libya, Malaysia, Maldives, Mauritius, Mexico, Moldova, Mongolia, Mozambique, Myanmar, Namibia, Nepal, Nigeria, Papua New Guinea, Paraguay, Peru, Philippines, Russia, Samoa, Sao Tome and Principe, South Africa, Sri Lanka, St Vincent and the Grenadines, Suriname, Tajikistan, Tanzania, Thailand, Timor-Leste, Tonga, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, Uzbekistan, Venezuela, Vietnam, Yemen and Zambia

A2. Databases searched

- Sociological abstracts
- Cochrane Library (Cochrane Reviews and Cochrane Trials Register)
- Grey literature sources
  - Campbell Systematic Reviews
  - Epistemonikos
  - Oaister
  - Proquest Dissertations and Theses
  - PROSPERO
  - TRIP Database
  - TRoPHi
- Medline (Pubmed)
- SocIndex (EBSCO)
- Embase (OVID)
- Web of Science (Clarivate)
- PsycInfo (EBSCO)
- CINAHL (EBSCO)
- Medline (EBSCO

A3. Example search strategy (Medline)

The following strategy was adapted to the other databases listed above.

Search string 1 (unconditional cash transfers – older people terms and general terms) (title)

"unconditional cash transfer*" OR "social cash transfer*" OR "Cash transfer program*" OR "social assistance" OR "social allowance" OR "special poverty support-tekun jiuzhu" OR "social safety net" OR "basic social subsidy program*" OR "social security scheme" OR "universal allowance" OR "social welfare" OR "cash transfer" OR Pension* OR "non-contributory pension program*" OR "old-age social pension" OR "social pension*" OR "social pension scheme" OR "old age pension" OR "old-age pension" OR "universal pension scheme" OR "universal old age pension" OR "old age social pension" OR "non-contributory pension" OR "non-contributory assistance program*" OR "Renta Universal de Vejez" OR "continuous benefit program*" OR "minimum social pension" OR "Colombia elderly programme" OR "solidarity pensions of the subsidized regime" OR "pension* for elderly" OR "social solidarity pension" OR "old age grant" OR "Indira Gandhi National Old Age Pension Scheme" OR "Aid Program for the Elderly" OR "social pension program*" OR "older person* cash transfer" OR "elderly fund scheme" OR "senior citizen* benefit" OR "old age basic pension" OR "basic retirement pension" OR "pension for older people" OR "pension for the well-being older people" OR "social welfare pension*" OR "old age allowance" OR "national solidarity assistance program*" OR "subsidy to the unknown" OR "elderly assistance program*" OR "elders assistance program*" OR "senior citizen grant" OR "great mission in elder love"

Search string 2 (geographical indicators) (title or abstract)

"Low- and middle-income countr*" OR "low and middle income countr*" OR low income countr* OR "low-income countr*" OR "middle income countr*" OR "middle-income countr*" OR LMIC OR "developing countr*" OR "underdeveloped countr*" OR Albania OR Argentina OR Armenia OR Azerbaijan OR bangladesh OR Belarus OR belize OR Bolivia OR Botswana OR brazil OR Bulgaria OR "cabo verde" OR "cape verde" OR china OR Colombia OR "costa rica" OR "Dominican republic" OR Ecuador OR Egypt OR "el Salvador" OR Eswatini OR Fiji OR Georgia OR Guatemala OR India OR Indonesia OR Iraq OR Jamaica OR Kazakhstan OR Kenya OR Kiribati OR Kosovo OR "Kyrgyz Republic" OR Lesotho OR Libya OR Malaysia OR Maldives OR Mauritius OR Mexico OR Moldova OR Mongolia OR Mozambique OR Myanmar OR Namibia OR Nepal OR Nigeria OR "Papua New Guinea" OR Paraguay OR Peru OR Philippines OR Russia OR "Russian Federation" OR Samoa OR "Sao Tome and Principe" OR "South Africa" OR "Sri Lanka" OR "St Vincent and the Grenadines" OR Suriname OR Tajikistan OR Tanzania OR Thailand OR Timor-Leste OR Tonga OR Turkey OR Turkmenistan OR Tuvalu OR Uganda OR Ukraine OR Uzbekistan OR Venezuela OR Vietnam OR Yemen OR Zambia

Search string 3 (study types) (abstract)

"randomi#ed control* trial" OR "control* trial" OR "clinical trial" OR RCT OR random* OR placebo* OR "quasi experiment*" OR "quasi-experiment*" OR "control group*" OR "cohort stud*" OR "comparative stud*" OR "intervention stud*" OR "evaluat* stud*" OR "compari* stud*" OR "before and after" OR "follow up" OR "follow-up" OR "time series" OR "pre test" OR pre-test OR pre-intervention OR "post test" OR post-test OR posttest OR post-intervention OR "repeat* measur*"

OR

Randomized Controlled Trials [MeSH] OR Random Allocation [MeSH] OR Placebos [MeSH] OR Single-Blind Method [MeSH] OR Double-Blind Method [MeSH] OR Control Groups [MeSH]

Search combinations: 1 and 2 and 3

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