A role for universal pension? Simulating universal pensions in Ecuador, Ghana, Tanzania and South Africa

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Abstract

We use four novel, cross-country comparable tax-benefit microsimulation models for Ecuador, Ghana, Tanzania and South Africa to evaluate ex ante the expansion of a universal old-age pension in a static setting. Universal pensions would significantly reduce poverty and inequality in settings where no means-tested old-age pensions exist (such as in Ghana and Tanzania). If means-tested old-age pensions exist and shall be maintained, universal pensions as a top up scheme only make a difference for the income distribution if the existing schemes do not reach the entire vulnerable population such as in Ecuador. Costs for the proposed schemes are substantial.

Keywords— tax-benefit microsimulation, SOUTHMOD, poverty, old-age benefit
JEL Classification— H55, I32, C15

1 Introduction

In developed countries static tax-benefit microsimulation models are readily available and common tools for evaluating public policies. For developing countries by contrast microsimulation models rarely exist. Therefore, previous literature using microsimulation models is concentrated on Europe, Australia and Northern and Latin America (Sutherland, 2014). Yet, as the importance of social protection and domestic revenue mobilization grows - as documented by the Sustainable Development Goals, a tool capable of describing and capturing (first-round) effects of tax-and-benefit policies in developing countries becomes ever more crucial.

A commonly debated and in a few select countries already realized social protection policy in the developing country context is a universal pension benefit. We use microsimulation models for Ecuador, Ghana, South Africa and Tanzania to discuss the first-round effects of such policy on poverty and inequality highlighting the versatility but also challenges when employing microsimulation models in a developing country context.

Our contribution to the literature is three-fold. First, we show how static tax-benefit microsimulation models can be used to evaluate ex ante the expansion of social protection policies in a developing countries context in a static setting. Second, we contribute to the ongoing debate of poverty reduction in the developing world, and in particular among the elderly population. Third, our paper is the first using detailed static microsimulation models across different developing countries comparatively. We implement different scenarios, varying eligibility criteria and benefit amounts (tied to national or international benchmarks), maintaining or abolishing existing systems in countries where means-tested schemes for the elderly population already exist. Finally, we shed light on how costly such an intervention would be for countries.

We use tax-benefit microsimulation models for four countries, namely Ecuador (ECUAMOD), Ghana (GHA-MOD), South Africa (SAMOD) and Tanzania (TAZMOD), all developed in the scope of the

SOUTHMOD project (for more information see Sutherland, Pirttilä, and Wright (2017) and UNU-WIDER (2017)). Our choice of countries allows us to illustrate the hypothetical introduction of a uniform policy, an old-age universal pension, in four distinct settings. Beyond geographic, cultural and historical differences, these four countries are at different points in their economic development yet there is similar concerns regarding social protection.

The versatility of the EUROMOD software (University of Essex, 2017) allows to model the different tax-benefit systems and take into account existing contributory pension schemes and/or means-tested old-age benefits when implementing a hypothetical old age pension reform. We vary the benefit amounts between 50% of the National Poverty Line (NPL) or 50% World Bank $3.1 a day line, as well as the age threshold (60 or 70) to capture national reference points as much as an international benchmark measure and implement more or less generous and thus costly reform scenarios. The models are also flexible to pick up one of the main conceptual differences between more or less developed countries when looking at distribution measures: While in the developing world (as in Ghana and Tanzania) poverty and inequality are measured based on consumption, such measures are typically based on income data in more developed countries (as in Ecuador and South Africa).

The introduction of a universal pension scheme lends itself readily as a suitable thought experiment for expanding social protection in developing countries for various reasons. First, it addresses an important group of the population that is vulnerable to poverty in a context where few old people are covered by contributory schemes. Second, such reforms are straightforward to implement in practice as no proxy means test (PMT) or other targeting mechanism is needed in settings where administrative capacity and funds are often low. Other advantages of such scheme include the transparent allocation mechanism and social acceptance of support for elders (for example commented in the case of the Zanzibar universal pension (The Conversation, 2017)).

For the purpose of this study we implement a hypothetical universal non means-tested old-age pension benefit to all citizens above a certain age in each of the four countries studied (Ecuador, Ghana, South Africa and Tanzania) using the respective country's microsimulation model. Our results corroborate that the country context is crucial: In countries with no existing non-contributory schemes (such as in Ghana and Tanzania), poverty and inequality decrease substantially at very high cost for government.

In countries with existing means-tested benefits for the elderly (such as in Ecuador and South Africa) substituting means-tested benefits with universal benefits may entail lower poverty and inequality in settings where the means-tested universal benefit is not reaching all of the poor (such as in Ecuador for certain reform scenarios) or if the benefit were less generous. By contrast, it may entail significantly higher poverty and inequality in settings where the means-tested benefit is generous and covering the majority of the poor population, such as in South Africa.

The implications of maintaining the existing means-tested benefit and delivering the universal pension as top-up scheme to the existing benefit also differ based on the existing tax-benefit systems. If the existing means-tested minimum pensions are generous and coverage is wide, poverty and inequality are barely affected such as in South Africa. If coverage is limited as in Ecuador, top up schemes nevertheless may have important positive effects on poverty and inequality.

We first discuss different universal pension schemes and results from previous literature for the developing world in Section 2. We then introduce the hypothetical universal pension reform and how we implement them in the existing tax-benefit systems of four chosen countries through the SOUTHMOD microsimulation models in Section 3. In Section 4 we present results on poverty, inequality and implications for government expenditure, before Section 5 concludes.

2 Universal pensions in the developing world

2.1 Universal pensions - a fluid concept that comes in various shapes

The term "universal pension" is not clearly defined, nor is the related term "minimum pension". In its pure form a universal pension would be based on age, potentially also on citizenship and place of

residence but independent of the individual's income situation. By contrast, minimum pension schemes would involve some kind of means test or targeting.[1]

'Pure' universal pensions, thus without applying any means-test are rare in practice though. Different kinds of universal pension policies exist in New Zealand, Mauritius, Namibia, Botswana, Bolivia, Nepal, Samoa, Brunei, Kosovo, Mexico (Willmore, 2007) and Zanzibar (Galvani & Knox-Vydmanov, 2017).

In the scope of the debates on targeted versus universal benefits in recent years, universal pension policies have attracted attention. Zanzibar is one of the most recent examples of implementing a 'pure' universal pension; first benefits were paid out in April 2016 to Zanzibar residents (or those who have been Zanzibar residents for over 10 years continuously after age 18) 70 years or older (Galvani & Knox-Vydmanov, 2017). Most recently Kenya announced that starting 2018 every Kenyan aged 70 or older will be entitled to a monthly pension (HelpAge International, 2017a). In Zanzibar and Kenya the universal pension was introduced based on experience with prior pilot programmes.

Namibia, by contrast, has a long-standing universal pension which has been in force since 1994 but the initial origins of the scheme actually can be tracked back to before independence (Levine, van der Berg, & Yu, 2011). South Africa in turn features a minimum pension, thus a means-tested old-age pension which will be discussed in detail below.

Mexico has a universal pension scheme which was first introduced in Mexico City in 2001. After 2013, all Mexican citizens aged 65 or above who do not receive any other (contributory) pensions are recipients of the non-contributory pension (Arza, 2017). Thus, the Mexican pension scheme is not a 'pure' universal pension. By contrast, Bolivia has a true universal pension scheme which has been in force since 1997 but it has changed several times in the history of the scheme. Today Bolivians aged 60 or above are eligible for the benefit (Arza, 2017). There are two benefit amounts: 1) a higher benefit for those who do not receive contributory pension and 2) a smaller benefit for those who also receive a contributory pension. The Bolivian universal pension scheme has the highest coverage in Latin America. In 2013, the 96 % of Bolivian elderly was receiving the benefit.

2.2 Benefits and costs of (universal) pensions in the developing world

Various studies confirm that universal and minimum pension schemes reduces poverty in developing countries, usually the first and foremost reason for the introduction of such schemes. For Namibia, one of the few countries with a universal pension in its pure form, Levine et al. (2011) show that the Old Age Pension (OAP) lowers the probability of experiencing poverty. Effects of the OAP on inequality are however not significant.

The South African minimum pension scheme has reduced the number of South Africans living on less than $1 a day by 5 percentage points according to Case and Deaton (1998). Burns, Keswell, and Leibbrandt (2005) analyse the distribution of household income with and without pension income and confirm this result. Using a $1 per person per day as the poverty line, Jensen (2004) estimates that the minimum pension reduces the poverty rate by 26 percentage points.

Various microsimulation studies for Latin American countries conclude positive effects of universal and minimum pension schemes on poverty and inequality. This concords with the findings of various microsimulation studies for European countries and Australia on minimum pension schemes, see for example Tanton, Vidyattama, McNamara, Vu, and Harding (2009) for Australia, Atkinson, Bourguignon, O'Donoghue, Sutherland, and Utili (2002) for UK, France, Germany, Ireland and Italy, and Figari, Matsaganis, and Sutherland (2011) for 19 European Union member states.

Dethier, Pestieau, and Ali (2011) estimate effects of hypothetical pension reforms in 18 Latin American countries using microsimulation methods. They analyse both universal (thus not means-tested) pension schemes and minimum (thus means-tested) pension schemes using two different poverty line measures; (1) half of the median income and (2) USD2 a day line. The minimum pension benefit is a top up for existing pensions such that pension benefits as total are equal to the poverty line. By contrast, the universal pension benefit is lump-sum benefit (the amount of the poverty line) provided to all elderly. The

[1] See Willmore (2007) for a review of pension schemes in developing countries, including contributory system.

authors conclude that a minimum pension reduces old-age poverty in all countries whenever a country has not implemented a universal minimum pension systems. As expected, the poverty rates decline more in the case of universal pensions than in the minimum pension. They estimate that the relative cost of a minimum pension, when using half of the median income poverty line, is 0.1–2.9% of GDP depending on country and when poverty line is USD2 a day, ranges from almost zero to 1.5% of GDP.

Gasparini, Alejo, Haimovich, Olivieri, and Tornarolli (2010) also analyse hypothetical universal and minimum pension schemes for 19 countries in Latin America and the Caribbean. They estimate that both types of pension schemes reduce poverty and find unsurprisingly that minimum income pensions cost less than universal schemes. Olivera and Zuluaga (2014) use microsimulation techniques for Colombia and Peru. They estimate that existing means-tested pension schemes reduces poverty of total population by 0.7 percentage points in Colombia and 2 percentage points in Peru. The reduction is larger among the over 65 year old population and particularly in rural areas in both countries. The largest reduction of poverty rates with 24.8 percentage points occurs among Peruvians 65 years or older who live in rural areas. They find no impact on inequality except among the elderly population in Peru. The costs of universal pension scheme are 2.6% and 2.98% of total tax revenues in Colombia and Peru.

Pension receipt (regardless if means-tested or universal) may affect not only the pension recipients poverty and inequality status but can have impacts for the household, often multi-generational, overall. Bertrand, Mullainathan, and Miller (2003) show for South Africa that pensions received through a means-tested pension also benefit other members of family than just the pensioner. The pension also reduces the labour supply of household members aged 16–50, especially males. de Carvalho Filho (2012) shows that an old-age benefit received by household member increases girls' of ages 10-14 school enrolment but not boys' of same age in Brazil.

In a number of cases the above effects have been shown to vary with the gender of the recipient: In South Africa labour supply reductions on the household level are stronger when the recipient is female (Bertrand et al., 2003). For Brazil de Carvalho Filho (2012) shows that household's girls' labor supply decreases if the pension recipient is female. Furthermore, Duflo (2003) estimates that in case of a female pension recipient girls' nutrition and health was improved but there was no significant effect on boys.

Some studies highlight that in a world where traditional support to elderly people is decreasing and economic increasing, providing a pension to the elderly is not only a means to ensure their material wellbeing. It can also ensure or restore the dignity of the elderly and their physical safety (eg. witch killing in Tanzania (Miguel, 2005)).

One of the main concerns in the ongoing debate on universal versus targeted benefits is of course the associated level of costs. There are different answers (if not opinions) to the question which level of expenditure is sustainable. The assumptions made regarding the implementation of the benefit (in practice and in the analysis), the development of government revenue in the future and government's revenue mobilization capacity as much as its capacity to implement and administer certain reforms more or less cost efficiently are not always spelt out clearly and are contested from either side.

Kakwani and Subbarao (2005) run simple simulations evaluating pension schemes in 15 African countries to calculate poverty rates and costs of introducing universal pensions. Benefits are either 70% of the national average poverty threshold or are restricted to not sum up to more than 0.5% of GDP, age threshold is either 60 or 65. They conclude that universal pension schemes are too expensive and recommend targeting pensions at the poor only.

For Mauritius, for example, Soto, Thakoor, and Petri (2015) argue the country should reform its universal pension towards a targeted system as the IMF considers the universal pension unsustainable in terms of costs to the government. Spending is simulated based on pension expenditure and average wages, assuming full coverage by the universal pension, and real GDP growth and CPI inflation of 4%. In this framework expenditure on the universal pension is at 2.2% of GDP in 2013, rising to approximately 6.5% of GDP in 2040. Based on these simulations and predictions IMF judge the growth of expenditure on universal pension as not sustainable given the current tax system and an ageing population.

Willmore (2006) opposes this view and finds that the Mauritian universal pension is affordable 1.9% of GDP in 2000. He uses the number of pension age population and reported benefit amounts to estimate

expenditure on the universal pension. He forecasts cost of between 1.9% and 4.8% of GDP for the years 2010 to 2040 and considers those as affordable given the predicted GDP growth.

The universal pension recently introduced in Zanzibar is the first government funded universal pension in East Africa (Galvani & Knox-Vydmanov, 2017). The benefit amount is fixed at 50% of the food poverty line, amounting to TZS 38 070 in 2016. The government budgeted TZS 6.5 billion in 2016/17 for starting the scheme. This is about 0.24 % of Zanzibar's GDP.

Obviously the cost for the benefit itself are considerably higher in a universal scheme; yet implementation of a means-tested benefit require considerably more funds and administrative capacity, a resource that is often scarce in the developing world. A common argument in favour of universal benefits is thus a reduction of administrative costs, bureaucracy and corruption (see, for example, Willmore (2007) for South Africa). Also, Niño-Zarazúa, Barrientos, Hickey, and Hulme (2012) comment that the social program which cost 1% of GDP would be hard to finance given governments' often limited tax base and collection as much as limited institutional capacity.

3 Design of a universal pension reform and implementation across countries

3.1 Pension systems in Ecuador, Ghana, Tanzania and South Africa

We choose Ecuador, Ghana, Tanzania and South Africa for implementing a hypothetical universal pension. All four countries share similarities while they are at different stages in their development and the universal pension reform is implemented in rather different tax-benefit systems.

While Tanzania is classified as a low income country by the World Bank, Ghana has attained lower middle income country status (see Table 1). Both these countries measure poverty as is usual in many developing countries using consumption. Tax and benefit systems are rather simple and due to a large informal sector coverage by contributory pensions systems is low and mainly restricted to government employees.

Ghana has three contributory based pension schemes of which two are mandatory and one is voluntary for formal sector employees. The pension received out of the contributory system depends on the amount of contributions and the number of years of contribution (Adu-Ababio, Osei-Darko, Pirttilä, & Rattenhuber, 2017). The two mandatory contributory systems in place are the Social Security and National Insurance Trust (SSNIT), the main system for private sector, civil and public servants, self-employed, farmers, artisans, professionals and traders; and the a scheme for military, police and few civil servants. Coverage through these schemes reaches a mere 10% of the labour force (Stewart & Yermo, 2009). Outside the public pension scheme elderly people may qualify for the LEAP (Livelihood Empowerment against Poverty) benefit, a means-tested benefit provided to the poorest of the country and available for those 65 years or older with limited economic capacity. The programme was in the process of being rolled out in 2013 and has seen extensions of scope and generosity since then.

Mainland Tanzania operates several contributory pension schemes, yet with low coverage overall and often complex and fragmented (Leyaro, Kisanga, Noble, Wright, & McLennan, 2017). Thus, only few elderly have access to a pension. The Productive Social Safety Net (PSSN) programme started in 2012 and two cash transfer elements have been subsequently rolled out nationally from 2014 on in mainland Tanzania. Both elements are means-tested; the fixed basic cash transfer addresses poor families, whereas the variable conditional cash transfer is targeted at families with children. Old age features neither as part of the eligibility criteria nor as a dedicated benefit rate in this programme though. For this study we consider the tax-benefit system in 2012, thus before the PSSN cash transfer schemes were fully rolled out.

Ecuador and South Africa are upper middle income countries with more developed tax-benefit systems. Poverty is typically measured (as in developed countries) based on disposable income. The latest headcount poverty rate is 23.1% from June 2017 in Ecuador (using NPL) and Statistics South Africa

(2017) latest estimate is 55.5% from 2015 (using R992 poverty line). Both countries provide a more (South Africa) or less (Ecuador) generous means-tested benefit to the elderly population.

South Africa provides a minimum pension, the so-called Old Age Grant (OAG). Eligibility is based on age (60 years or older) and income; a single person with income below R64 680 per year and couples with income below R129 360 per year qualify. In 2014 the minimum benefit amount is R100 per month, the maximum R1 410 per month (Wright, Noble, Barnes, McLennan, & Mpike, 2016). Practically, the OAG is targeted to poorer African elderly households since the majority of the white elderly population does not pass the means test and is thus not eligible (Case & Deaton, 1998). The coverage of OAG was 74% of population aged 60 or above (HelpAge International, 2017b). Moreover, South Africa has two contributory pension schemes; (1) the occupational and (2) personal retirement schemes. Both schemes are voluntary (Stewart & Yermo, 2009). The occupational retirement scheme is voluntary in the sense that employers can decide to set up or not the retirement fund and what type of workers are mandatory to participate the fund. The mandatory participation of workers makes the scheme actually quasi-mandatory. The personal retirement scheme is basically a voluntary retirement savings scheme with tax incentives. National Treasury (2004) estimates that the coverage of the occupational schemes is between 66% and 84% of workers in a formal sector.

Ecuador features a contributory pension system (a general one and a system specific to the armed forces and national police) and a means-tested pension system embedded in a broader means-tested benefit, the HDT (Human Development Transfer or Bono de desarrollo humano (BDH)), for the elderly. In the scope of the HDT an individual that scores below a certain threshold value in the Social Registry (a composite index of socioeconomic variables) and is 65 years or older is entitled to USD50 per month in 2014 (Jara, Cuesta, Varela, & Amores, 2017). The combined coverage of both systems was 62% of the population aged 65 or above in 2013 (HelpAge International, 2017b).

3.2 Implementation of a universal pension reform across countries

For the purpose of this study we define "universal pension" as a benefit paid to all citizens residing in the country of a certain age or higher. No means test is applied and no prior contribution history to a public scheme (if such exists) is required. For illustrative purposes we will vary the age threshold (60 and 70 years) and the benefit amount. Making a sensible choice of benefit across countries remains a somewhat arbitrary judgement. We therefore show results for three different benefit amounts which relate to benchmark values that are either nationally defined or internationally set:

1. 50% of the national poverty line,
2. 50% of the food poverty line,
3. 50% of the World Bank $3.10 a day line.

Table 1 shows the different poverty lines and the respective benefit amounts and age thresholds used in the three chosen reform scenarios. Reform scenarios were chosen so as to show a generous benefit with wide coverage (Reform 1: 60 years or older and half the NPL) and a limited benefit with low coverage (Reform 2: 70 years or older and half the FPL). The internationally more comparable World Bank poverty line measure used in Reform 3 happens to lie in between the other two national scenarios regarding benefit generosity for Ghana and Ecuador. In Tanzania the World Bank line is above the national benchmarks and in South Africa below the national benchmarks.

National poverty lines are typically based on a certain level of food consumption considered physically necessary and nutritional standards. The food poverty line (FPL) is therefore often constructed from consumption of calories per day. The national or basic needs poverty line (NPL) then includes, on the top of food consumption, the basic non-food amenities. Food and non-food items included in the estimates and assumptions regarding nutritional necessities on which FPL and NPL are based can vary between countries.

In Ghana, the FPL (referred to as the lower or extreme poverty line) is based on 2 900 calories per adult equivalent per day (Ghana Statistical Service (GSS), 2014). The calorie amount is multiplied by the calorie price. The FPL is thus GHS 66 per month which amounts to 27.1 % of the mean consumption level in 2012/13. The NPL (referred to as the upper poverty line) is the FPL plus the basic non-foods consumption. This has been fixed at GHS 109.5 per month which is 44.9 % of the mean consumption level in 2012/2013.

In Tanzania, the FPL is based on expenditure for 2 200 calories of food consumption per day (NBS, 2014), which adds up to TZS 26 085.5 per month. The NPL (referred to as the basic needs poverty line) is derived from the FPL by scaling it up by factor 1/0.715 which brings the NPL up to TZS 36 482 per month. Both poverty lines were constructed based on 2012 surveys.

In South Africa, the FPL what we use in our calculation (referred to as the lower bound poverty line) is R645 per month which is based on the cost of 2 100 calories per day (Budlender, Leibbrandt, & Woolard, 2015; Statistics South Africa, 2015). Unlike in other countries, this FPL also includes some basic non-food amenities. The FPL strictly speaking would thus be lower than the line we use. However, (Statistics South Africa, 2015) argues that the FPL without non-food items is extremely low, and even the FPL what we use is so low that individuals basic food and non-food needs are not covered. The NPL is R1252 per month which contains the food poverty line and the average amount of the non-food expenditure.

In Ecuador the poverty line is based on the 5th round of Encuesta de condiciones de vida (ECV) from 2006, from which the cost of a basket of goods and services including housing, health and education services is derived. It is updated on a yearly basis. For 2014 the FPL (referred to as the extreme poverty line) was defined as USD45.67 and the NPL as USD81.04.

Table 1: Characteristics of simulated reforms and poverty lines

	Ghana	**Tanzania**	**Ecuador**	**South Africa**
Simulated year	2013	2012	2014	2014
World Bank country classification by income	Lower middle	Low	Upper middle	Upper middle
Poverty lines:				
National poverty line (NPL, food poverty line plus basic amenities)	109.5	36,482	81.0	1,252.0
Food poverty line (FPL)	66.0	26,086	45.7	642.0
World Bank $3.1 a day line (WBPL)	84.9	53,571	52.7	505.1
Benefit amounts in reform scenarios:				
Reform1: $\geq$60, 50% NPL	54.8	18,241	40.5	626.0
Reform2: $\geq$70, 50% FPL	33.0	13,043	22.8	321.0
Reform3: $\geq$60, 50% WBPL	42.4	26,786	26.4	252.6

Source: Country classification,
https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups.

Notes: All monetary values in national currency units.

3.3 The SOUTHMOD microsimulation models for Ecuador, Ghana, Tanzania and South Africa

We use fully-fledged static microsimulations for Ecuador (ECUAMOD), Ghana (GHAMOD), Tanzania (TAZMOD) and South Africa (SAMOD) to simulate the hypothetical universal pension reforms dis-

cussed above. The respective country reports discuss in full detail how the different tax-benefit reforms are implemented in the microsimulation models.

All models are based on rich household surveys that capture a broad picture of the demographics, labour market situation, income and consumption of household members: GHAMOD uses the Ghana Living Standards Service Survey Round 6 (GLSS 6) from data collection years 2012/2013 (Ghana Statistical Service (GSS), 2014); TAZMOD the 2011/12 Household Budget Survey (HBS 6th round) of Tanzania Mainland (NBS, 2014); SAMOD uses the National Income Dynamics Study (NIDS) 2014-2015 Wave 4 Version 1.1, as published by DataFirst in 2016 (Southern Africa Labour and Development Research Unit (SALDRU), 2016). ECUAMOD uses the The National Survey of Income and Expenditures of Urban and Rural Households (Encuesta Nacional de Ingresos y Gastos de Hogares Urbanos y Rurales, ENIGHUR), collected in 2011/2012 and monetary values are uprated to 2014 as the tax-benefit system as of 2014 is analysed (Ecuador National Statistical Institute, 2012).

All models capture income taxes, turnover taxes social security contributions, VAT and excise taxes, other relevant taxes and benefits as far as the underlying data allow (for more details see the respective country reports for ECUAMOD (Jara et al., 2017), GHAMOD (Adu-Ababio et al., 2017), Tanzania (Leyaro et al., 2017) and South Africa (Wright et al., 2016)). Across all four countries pension receipt through existing contributory schemes is not simulated as the underlying data lacks information on contribution records. Instead we use the information on contributory pensions received as reported in the data. For South Africa the not fully mandatory occupational pension scheme is not simulated due to lack of information in the underlying data. The means-tested benefits accruing to elderly people in South Africa (the OAG benefit) and the portion of the means-tested benefit accruing to elderly people in Ecuador (as part of the HDT policy) are modelled in SAMOD and ECUAMOD respectively ((Jara et al., 2017), (Wright et al., 2016)).

3.3.1 Differential implementation of a uniform reform across countries

Working with a fully fledged microsimulation model for each country we can take into account of the characteristics of existing benefit systems described above. We therefore can implement universal pension differently for Ghana and Tanzania than in the case of Ecuador and South Africa, countries where a means-tested minimum pension already exists. For Ghana and Tanzania, we only restrict receipt of the universal pension benefit to those not receiving a public pension (if such scheme exists in the country), regardless of the amount received from the contributory scheme.

For Ecuador and South Africa, we implement the reforms discussed above for two different scenarios: (1) In the first scenario we abolish the existing means-tested pension scheme and introduce a universal pension benefit. All citizens aged 60/70 or above receive same benefit amount, regardless of the amount they received before. (2) In the second scenario we implement a universal pension so that no one gets worse off. We keep the existing means-tested minimum pension schemes in place and on top introduce the universal pension. Those elderly who do not receive the minimum pension receive the full universal pension benefit. Recipients of the existing minimum income pension who receive a smaller amount under the minimum income pension than under the universal pension, benefit from a top up. Thus for them, the universal pension benefit amount is the difference between universal pension and existing pension. Recipients of the minimum pension with a larger minimum income pension than universal pension benefit are not entitled to the universal pension benefit.

3.3.2 Measuring poverty and inequality

We use the headcount and poverty gap indicator out of the Foster-Greer-Thorbecke family of poverty measures (FGT(0) and FGT(1)) to analyse poverty. The headcount index, FGT(0), measures the proportion of individuals whose income or expenditure is below the poverty line. The poverty gap index, FGT(1), measures the average of poverty gaps divided by the poverty line. In addition, we measure inequality using the Gini coefficient. It gets values between 0 and 1. Zero denotes perfect equality and

one absolute inequality in terms of earnings. We show these measures across the total population and among recipients.

Estimated poverty rates depend on the chosen poverty line. In the developing country context absolute poverty lines are usually used and countries define their own poverty lines, often calorie-based (see section 3.2). Other absolute measures are more easily compared across countries such as the $1-2 a day line (eg. Case and Deaton (1998), Dethier et al. (2011)). Yet, they usually are less established in the national debate. In developed countries, by contrast, relative poverty lines are commonly used, often fixed at 40-60 per cent of the mean or median equivalised disposable household income (eg. Atkinson et al. (2002), Dethier et al. (2011), Tanton et al. (2009)). We chose to show poverty results using NPLs in order to retain easy comparability to the countries' benchmark status quo poverty rates.

Another factor affecting distributional measures such as poverty and inequality is the choice of the equivalence scale used to convert household level income/consumption. Across countries the definition of equivalence scales varies. Ghana and Tanzania, for example, both use a calorie-based equivalence scale but the amounts of calories assumed necessary for adults of a certain age are not entirely identical across both countries. Ecuador and South Africa, by contrast, attribute the same weight to each household member, unlike the different OECD scales that attribute a higher weight to the first and grown-up household members. This approach also differs from the square root approach currently used by OECD (OECD, 2017). We use countries' chosen equivalence scales discussed above so that our results are easily comparable to countries' baseline results.

In microsimulation models hypothetical policy scenarios affect the disposable income through higher or lower tax payments or benefit receipts. Distributional measures such as poverty and inequality are calculated based on the disposable income. This is the usual approach in developed countries which we follow for Ecuador and South Africa, where poverty is estimated based on income.

In many developing countries, by contrast, poverty is measured based on consumption.[2] In Ghana and Tanzania, poverty is measured using consumption. The universal pension we simulate though increases disposable income. And while we could show poverty based on income (using imputed values for own produce) this would stop short of providing meaningful poverty estimates. We therefore resort constructing "consumption possibilities", a concept intended to capture the increase or decrease in consumption possibilities due to an increase or decrease of disposable income.

Specifically, we use the consumption observed in the data (and used by the National statistical authorities to compute poverty), subtract actual transfers received and instead add simulated transfers (see Adu-Ababio et al. (2017) for more details). Similarly, we add actual taxes and social security contributions paid and subtract simulated taxes and social security contributions. With perfect data and no hypothetical reforms we thus should end up with a value of "consumption possibilities" equal to the consumption observed in the data. This approach produces consumption poverty rates that are rather close to the measures based on consumption observed in the data (for example, 24.9% vs 24.2% in Ghana). It is worth noting that even if consumption possibilities based poverty would deviate more this has limited implications for comparing poverty across scenarios: Assuming that people would consume any additional income (which is rather likely in a developing country context) actual taxes and transfers would cancel out in the difference between scenarios and the difference in simulated taxes and transfers is what determines the change in poverty.

4 Main findings

4.1 Characteristics of recipients and importance of the benefit

A universal pension benefit would, as per its rules benefit the older population, on average to about 70 year olds in the schemes with eligibility for those 60 years or older. Average age of the eligible in reform 2 that addresses those 70 or older is about 78 (Tables 2 and 3). Given lower life expectancy more females

[2] This is due to lack of income data (many people living of subsistence farming). But poverty measures based on consumption versus based on income also provide different information, see for example the work by Meyer and Sullivan (2009).

Table 2: Characteristics of elderly population in different reform scenarios in Ghana and Tanzania

	Ghana			Tanzania		
	Reform1 ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL	**Reform1** ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL
Age	71	78	71	71	78	71
Share of males (in %)	44.2	43.0	44.2	47.6	46.6	47.6
Household size	4.6	4.5	4.6	5.6	5.7	5.6
Share with no primary education (in %)	56.5	69.8	56.5	55.2	66.0	55.2
Benefit as share of equivalized consumption (in %)	39.9	25.5	31.0	41.5	30.7	60.9
Recipients out of total population (in %)	6.6	3.3	6.6	5.8	2.8	5.8
Share of recipients in age group (in %)	96.9	97.3	96.9	99.4	99.6	99.4

Source: Authors own calculations.

Notes: NPL=National poverty line, FPL=Food poverty line, WBPL=World Bank $3.10 a day line.

than males would benefit and average household size of the beneficiaries ranges from 3.4 in Ecuador to 5.7 in Tanzania. More than half of beneficiaries have not completed primary education.

Table 2 shows the characteristics of elderly population in Ghana and Tanzania for the different hypothetical reforms. Recipients constitute only a rather small part of the total population, ranging between 2.8% (Reform 2, Tanzania) and 6.6 (Reform 1, Ghana). Amongst the elderly coverage, by contrast, is high with more than 95% of elderly covered in any of the three reforms. This high coverage with a hypothetical universal pension is the flip side of the low coverage by the existing contributory pension schemes. The universal pension benefit amount as a share of equivalized consumption is above 25% in any of the reform scenarios and reaches more than 60% in Tanzania for Reform 3 where the benefit is the more generous and the age group larger (60 years or older) than under reforms 1 and 2. In both countries possible trickle down effects to the rest of the household could be important as the elderly recipients live in households on average composed of more than four persons.

In Ecuador coverage and the universal pension as a share of the equivalized income diverge considerably between reforms under scenario 1 and scenario 2.

In Ecuador, where coverage through a contributory scheme is largest out of the countries analysed, between 75% and 81% of senior population would receive the universal pensions in scenario 1. This drops to about half or a third in scenario 2, where the existing means-tested benefit is maintained. As the lump-sum benefit of USD50 provided in the existing scheme is larger than any of the benefits provided under the different reform scenarios, the universal pension covers exclusively those seniors that are not entitled to the means-tested benefit.

The universal pension equals between 37.5% (reform 1) and 23.7% (reform 2) of equalized income in scenario 1. This is somewhat lower under scenario 2 with 35.5% and 23.2% respectively. Eligibility to the existing means-tested benefit is restricted to those scoring below a certain threshold value in the Social Registry which is composed of not only income but also a host of other socio-economic variables. Thus, apart from limiting the scope of reach of the by fixing the threshold value, determinants other than the income situation determine eligibility. The universal benefit, by contrast, goes to everybody, regardless of income and other socio-economic variables, thus also seems to include many income-poor

Table 3: Characteristics of elderly population in different reform scenarios in Ecuador and South Africa

	Ecuador			South Africa		
	Reform1 ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL	**Reform1** ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL
Age	70	78	70	69	77	69
Share of males (in %)	45.9	44.0	45.9	40.1	34.7	40.1
Household size	3.6	3.4	3.6	4.3	4.4	4.3
Share with no primary education (in %)	61.5	74.2	61.5	48.1	53.8	48.1
Recipients out of total population (in %)	8.3	3.8	8.3	8.1	3.1	8.1
Share of recipients in age group, scenario 1 (in %)	81.3	76.3	81.3	100.0	100.0	100.0
Benefit as share of equivalized income, scenario 1 (in %)	37.5	23.7	24.5	58.2	31.2	23.5
Share of recipients in age group, scenario 2 (in %)	51.3	32.7	51.3	14.4	10.7	12.5
Benefit as share of equivalized income, scenario 2 (in %)	35.5	23.3	23.3	7.5	3.5	3.0

Source: Authors own calculations.

Notes: NPL=National poverty line, FPL=Food poverty line, WBPL=World Bank $3.10 a day line.

people who do not qualify for the means-tested benefit.

In South Africa coverage reaches 100% of the relevant senior population under scenario 1 as no contributory scheme as such is simulated for South Africa. This drops to between 11% and 14% (reform 1 and reform 3) in scenario 2 as the means-tested OAG benefit is generous and phased out until reaching the rather high upper eligibility threshold compared to the benefits handed out in the reform scenario. Therefore the majority of seniors retains the means-tested benefit in scenario 2 and the universal pension benefit goes only to the better-off part of the elderly population. This also shows in the impact of the universal pension on equivalized income; in scenario 1 the universal pension constitutes between 23.5% (reform 3) to 58.2% (reform 1), thus a very substantial contribution under reform 1. Under scenario 2 this plummets to between 3% and 7.5% as a comparatively much better of group receives the universal pension.

4.2 Poverty and inequality

Poverty and second to that inequality reduction are often the main motivation for the introduction of universal benefits. In Ghana and Tanzania our simulations confirm that in a static setting both, poverty and inequality as measured by the Gini index are reduced among the group of eligible as much as among the population overall. The picture is more nuanced in Ecuador and South Africa where a more or less generous, large scope means-tested benefit for the elderly is in place. The reforms are not revenue-neutral, see section 4.3 for a discussion of budgetary implications. The results also assume no leakage and do not take into account neither the costs associated of implementation and administration of the

hypothetical reforms nor any of the administrative costs associated with the standing systems.

Table 4: Ghana: Poverty and inequality indicators

		Ghana			
		Status quo	**Reform1** ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL
Total population	**FGT(0)**	0.249	0.238	0.245	0.240
	FGT(1)	0.085	0.080	0.083	0.081
	Gini	0.433	0.428	0.431	0.429
Beneficiaries of reform 1	**FGT(0)**	0.247	0.188		
	FGT(1)	0.083	0.057		
	Gini	0.444	0.428		
Beneficiaries of reform 2	**FGT(0)**	0.271		0.230	
	FGT(1)	0.088		0.068	
	Gini	0.435		0.426	
Beneficiaries of reform 3	**FGT(0)**	0.247			0.200
	FGT(1)	0.083			0.061
	Gini	0.444			0.431

Source: Authors own calculations.

Notes: NPL=National poverty line, FPL=Food poverty line, WBPL=World Bank $3.10 a day line.

In Ghana and Tanzania poverty and inequality decrease across all three hypothetical reforms (see Table 4 for Ghana and Table 5 for Tanzania), unsurprisingly most among the beneficiary group. As expected the biggest decrease is for the reform reaching the most people (thus those 60 years or older) offering the most generous pension amount, that is reform 1 in Ghana and reform 3 in Tanzania. In Ghana reform 1 reduces headcount poverty by 24% and the poverty gap by 32% in the recipient group and the pattern is similar for reform 1 in Tanzania. Reform 3 in Tanzania reduces poverty even more, namely headcount poverty by 33% and the poverty gap by 42%. The poverty reduction among the elderly also impacts poverty among the population overall; in Tanzania headcount poverty (the poverty gap) decreases by 4.25% (7.2%) in reform 1 and by 6.7% (9.6%) in reform 3.

Effects on inequality are sizeable as well, going down by 1.2% in Ghana with reform 1 (3.4% in the recipient group). In Tanzania, where inequality among the older population is already under the status quo lower than in the total population (0.371 vs 0.416), inequality decreases overall but even more so for the elderly population.

Unlike in Ghana and Tanzania, Ecuador and South Africa both feature existing minimum pensions. Poverty and inequality outcomes therefore differ markedly depending on how the existing system is treated. Results in the upper panel of Table 6 for Ecuador and of Table 7 for South Africa show results for the status quo and the different reforms for scenario 1 in which the existing means-tested benefit is abolished and a universal pension introduced. We also provide a scenario of the status quo where the existing minimum pension policy is "turned off" as an alternative comparison (column "status quo 2"). The lower panel of tables 6 and 7 shows results for scenario 2 where no one looses the existing benefit but instead the universal benefit is handed out as a top up and to all other seniors not covered by the existing minimum pension.

In Ecuador, in scenario 1 only reform 1, the most generous reform, reduces poverty rates and inequality compared to the status quo ("status quo 1"); this holds for both the population overall and the beneficiary group (decrease of FGT(0) by 12% and of FGT(1) by 19%). Reform 2 increases poverty and inequality both among the total population and in the beneficiary group. Reform 3 has almost no impact

Table 5: Tanzania: Poverty and inequality indicators

		Tanzania			
		Status quo	**Reform1** ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL
Total population	**FGT(0)**	0.293	0.280	0.288	0.273
	FGT(1)	0.072	0.067	0.070	0.065
	Gini	0.416	0.413	0.415	0.412
Beneficiaries of reform 1	**FGT(0)**	0.287	0.221		
	FGT(1)	0.070	0.047		
	Gini	0.371	0.360		
Beneficiaries of reform 2	**FGT(0)**	0.312		0.268	
	FGT(1)	0.079		0.061	
	Gini	0.352		0.346	
Beneficiaries of reform 3	**FGT(0)**	0.287			0.194
	FGT(1)	0.070			0.041
	Gini	0.371			0.356

Source: Authors own calculations.

Notes: NPL=National poverty line, FPL=Food poverty line, WBPL=World Bank $3.10 a day line.

on the distributional outcomes in the population compared to the status quo. All reforms reduce poverty and inequality though if compared to "status quo 2", thus abolishing the existing minimum pension.

In scenario 2 (lower panel of Table 6), all reforms reduce poverty and inequality compared to the status quo. In sum this illustrates that the existing means-tested minimum pension scheme in Ecuador does not capture all poor seniors. The top-up universal pension, by contrast, reaches those elderly citizens and therefore poverty and inequality decrease. The largest decrease in poverty and inequality is again observed for reform 1, where headcount poverty decreases by 19%, the poverty gap by 33% and inequality decreases by 2.9%.

In South Africa, the existing means-tested pension scheme is generous and well-targeted. Therefore, abolishing the existing pension scheme (scenario 1, see upper panel of Table 7)) and introducing a universal pension leads for all hypothetical reforms to an increase of poverty and inequality compared to the status quo with a targeted minimum pension (see upper panel of Table 7). The negative impacts are highest among the beneficiary group in reform 3. The picture changes to the opposite if comparing to a scenario where the existing minimum pension scheme would be abolished (column "status quo 2"); in such a scenario a universal pension would across all different hypothetical reforms lead to decreases in poverty and inequality for all groups analyzed. Reform 1, as the most generous, would decrease headcount poverty by 1.6%, the poverty gap by 7.2% and inequality by 1.5% (respectively by 6.5%, 29% and 4.5% in the beneficiary group).

In scenario 2 (lower panel of Table 7) with the universal pension topping up the existing scheme, the universal pension scheme would barely affect poverty and inequality. As discussed in Section 4.1 the universal pension is mainly provided to better off parts of the elderly population in this setting and therefore cannot reduce poverty. By contrast, such schemes nevertheless would be beneficial for inequality which is lower in all reforms.

Table 6: Ecuador: Poverty and inequality indicators

		Ecuador				
		Status quo1 existing benefit on	**Status quo2** existing benefit off	**Reform1** ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL
Scenario 1: Abolishing existing benefit						
Total population	**FGT(0)**	0.160	0.169	0.155	0.165	0.160
	FGT(1)	0.048	0.056	0.046	0.052	0.049
	Gini	0.460	0.465	0.458	0.463	0.460
Beneficiaries of reform 1	**FGT(0)**	0.208	0.271	0.183		
	FGT(1)	0.067	0.129	0.054		
	Gini	0.529	0.555	0.519		
Beneficiaries of reform 2	**FGT(0)**	0.268	0.369		0.313	
	FGT(1)	0.083	0.191		0.127	
	Gini	0.493	0.534		0.514	
Beneficiaries of reform 3	**FGT(0)**	0.208	0.271			0.215
	FGT(1)	0.067	0.129			0.077
	Gini	0.529	0.555			0.533
Scenario 2: Maintaining existing benefit						
Total population	**FGT(0)**	0.160	0.169	0.153	0.156	0.155
	FGT(1)	0.048	0.056	0.045	0.046	0.046
	Gini	0.460	0.465	0.457	0.458	0.458
Beneficiaries of reform 1	**FGT(0)**	0.208	0.271	0.169		
	FGT(1)	0.067	0.129	0.045		
	Gini	0.529	0.555	0.514		
Beneficiaries of reform 2	**FGT(0)**	0.268	0.369		0.248	
	FGT(1)	0.083	0.191		0.069	
	Gini	0.493	0.534		0.486	
Beneficiaries of reform 3	**FGT(0)**	0.208	0.271			0.183
	FGT(1)	0.067	0.129			0.051
	Gini	0.529	0.555			0.519

Source: Authors own calculations.

Notes: NPL=National poverty line, FPL=Food poverty line, WBPL=World Bank $3.10 a day line.

Table 7: South Africa: Poverty and inequality indicators

		South Africa				
		Status quo1 existing benefit on	**Status quo2** existing benefit off	**Reform1** ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL
Scenario 1: Abolishing existing benefit						
Total population	**FGT(0)**	0.570	0.598	0.589	0.597	0.596
	FGT(1)	0.298	0.349	0.324	0.344	0.339
	Gini	0.651	0.675	0.664	0.673	0.672
Beneficiaries of reform 1	**FGT(0)**	0.460	0.650	0.608		
	FGT(1)	0.198	0.454	0.322		
	Gini	0.645	0.734	0.701		
Beneficiaries of reform 2	**FGT(0)**	0.490	0.676		0.653	
	FGT(1)	0.224	0.475		0.411	
	Gini	0.588	0.691		0.683	
Beneficiaries of reform 3	**FGT(0)**	0.460	0.650			0.644
	FGT(1)	0.198	0.454			0.399
	Gini	0.645	0.734			0.734
Scenario 2: Maintaining existing benefit						
Total population	**FGT(0)**	0.570	0.598	0.570	0.570	0.570
	FGT(1)	0.298	0.349	0.298	0.298	0.298
	Gini	0.651	0.675	0.652	0.651	0.651
Beneficiaries of reform 1	**FGT(0)**	0.460	0.650	0.459		
	FGT(1)	0.198	0.454	0.198		
	Gini	0.645	0.734	0.648		
Beneficiaries of reform 2	**FGT(0)**	0.490	0.676		0.490	
	FGT(1)	0.224	0.475		0.224	
	Gini	0.588	0.691		0.590	
Beneficiaries of reform 3	**FGT(0)**	0.460	0.650			0.460
	FGT(1)	0.198	0.454			0.198
	Gini	0.645	0.734			0.646

Source: Authors own calculations.

Notes: NPL=National poverty line, FPL=Food poverty line, WBPL=World Bank $3.10 a day line.

4.3 Expenditure analysis

The flip side of reducing poverty and inequality through a universal pension scheme, is the associated costs for government. Table 8 shows the size of expenditure for the different reforms for Ghana and Tanzania and Table 9 for Ecuador and South Africa. The presented expenditure numbers abstract from any administrative costs that might be associated with the implementation of the policy.

Across countries the costs vary from between 0.16% (reform 2, scenario 1 in Ecuador) to 1.29% of GDP (reform 3 in Tanzania). Costs relative to government revenue span from 0.41% to 8.68% (same cases as before). Expenditure on universal pension as a share of government revenue or total direct tax receipt is higher for Ghana and Tanzania than for Ecuador and South Africa, which is in line with differences in countries' domestic revenue mobilization capacities. This also show in the ratio of costs of the reform relative to total direct taxes raised with 1% (reform 2, scenario 1 in South Africa) to 33.1% (reform 3 in Tanzania). Ghana and Tanzania do not have as large tax bases as Ecuador and especially South Africa.

By definition, universal pension reforms cost substantially more than a perfectly targeted means-tested benefit in order to reach the same scale of poverty reduction. The poverty gap in the eligible age group shows the budget necessary to lift everyone in that group out of poverty assuming perfect targeting. Comparing the cost of the universal pension with the poverty gap shows that in across schemes the costs are between half (reform 3, scenario 1, South Africa) and more than 10 fold the poverty gap (reform 1, Tanzania).

In Ghana, reform 1 is the most expensive and the expenditure is 18.36% of total direct tax receipt. Reform 3 is the costliest reform in Tanzania and the expenditure is 33.09% of total direct tax receipt, which is a massive share of tax revenue. In both countries it would be much cheaper to close the poverty gap through perfect targeting than provide the universal pension. Yet a well-targeted and transparent means-tested pension scheme is a challenging endeavour, potentially expanding administrative costs and bureaucracy significantly and possibly near impossible if administrative data quality is mixed and/or administrative and reliable data particularly for those to be addressed by the benefit is even patchier.

Table 9 shows for Ecuador and South Africa expenditure on the universal pension reforms in scenario 1, abolishing the existing means-tested pension scheme. In Ecuador, reform 1 is the most expensive and the expenditure on universal pension as share of total direct tax receipt is 14.82%. Reform 1 is more costly than the existing means-tested pension scheme. Reform 2 is the cheapest and it cost less than the existing means-tested pension scheme which amounts to 0.27% of GDP. For scenario 2 expenditure is accordingly (see Table 10 in the Appendix).

In South Africa, reform 1 is the most expensive but it would cost less than the existing means-tested pension scheme. The existing means-tested pension scheme has a high coverage and larger benefit amounts in South Africa. Therefore, all universal pension reforms would be cheaper than the existing means-tested pension schemes estimated at 1.58% of GDP. As very few seniors are eligible for the universal pension in scenario 2, costs are very low (see Table 10 in the Appendix).

Table 8: Expenditure on the universal pension, consumption-based countries

	Ghana			Tanzania		
	Reform1 ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL	**Reform1** ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL
As share of GDP (in %)	1.24	0.37	0.96	0.88	0.31	1.29
As share of government revenue (in %)	7.40	2.24	5.75	5.91	2.05	8.68
As share of total direct tax receipt (in %)	18.36	5.56	14.25	22.53	7.83	33.09
Expenditure (in millions)	1157.23	350.26	898.30	539254.82	187394.64	791854.06
As share of closing the poverty gap in age group (in %)	861.61	432.20	622.93	1047.75	575.60	1782.65

Source: Authors own calculations.

Notes: NPL=National poverty line, FPL=Food poverty line, WBPL=World Bank $3.10 a day line. In the calculations of closing the poverty gap we use NPL. All monetary values in national currency units.

Table 9: Expenditure on the universal pension, income-based countries, scenario 1

	Ecuador			South Africa		
	Reform1 ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL	**Reform1** ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL
As share of GDP (in %)	0.60	0.16	0.39	0.89	0.17	0.35
As share of government revenue (in %)	0.16	0.41	1.03	2.34	0.47	0.94
As share of total direct tax receipt (in %)	14.82	3.83	9.70	5.15	1.03	2.08
Expenditure on universal pension (in millions)	616.85	159.42	403.42	32723.09	6539.76	13199.01
As share of closing the poverty gap in age group (in %)	873.23	201.65	408.92	155.06	62.38	50.57
As share of the existing means-tested pension (in %)	219.73	56.79	143.70	54.36	10.86	21.93

Source: Authors own calculations.

Notes: NPL=National poverty line, FPL=Food poverty line, WBPL=World Bank $3.10 a day line. In the calculations of closing the poverty gap we use NPL. All monetary values in national currency units.

5 Conclusions

Social protection is on the rise in the developing world. This article uses the hypothetical introduction of a universal old-age pension to discuss the implications of such policy for Ecuador, Ghana, Tanzania and South Africa. We use novel, fully-fledged tax-benefit microsimulation models to illustrate how, depending on the country context a universal pension will have different effects on poverty, inequality and expenditure.

We find that in countries with no scheme specifically geared at the senior population, as in Ghana and Tanzania, poverty and inequality clearly decrease in the recipient group and across the population. Effects are substantial and their scope depends critically on whether the benefit amount is anchored to the national poverty line, the extreme poverty line or the World Bank defined $3.10 a day line. In countries with existing means-tested minimum pensions, like in Ecuador and South Africa, results differ markedly depending on the implementation of the universal benefit. Substituting the existing generous means-tested benefits with a universal pension increases poverty and inequality in South Africa. In Ecuador, where not all poor are equally covered by the existing means-tested benefit, the most generous of the hypothetical universal benefits would lead to less poverty and inequality. If existing systems are maintained, top-up schemes universal pension schemes lead to considerable reduction of poverty and inequality in Ecuador but less so in South Africa given its generous and large-scope minimum pension. In sum, considering the implementation of a universal pension across these four different countries highlights the importance of taking into account the national context.

Costs vary with the degree of generosity and scope of coverage of the universal pension between 0.17 and 1.29% of GDP. Across countries the importance of expenditure in terms of government revenue varies largely also with countries domestic revenue mobilization capacities. The debate on what level of expenditure is sustainable and whether universal benefits are "too expensive" rests on many assumptions. Fully fledged microsimulation models as those employed here help to inform the debate regarding the details of how a specific policy (such as a universal pension) could be implemented and how it might interact with other parts of the tax code. Due to their level of detail the models also allow to be clear on which assumptions are made.

The above analysis raises the question of how countries could finance such a reform. While revenue-neutral reforms can be implemented in the model such step requires a lot more country-specific assumptions. Furthermore, the results presented in this paper are based on static microsimulation models. We thus abstract from any behavioural changes that the introduction of a universal pension might have on people's behaviour. Behavioural responses to policy reforms is an ongoing area of research; in a developing country context, Osei, Pirttilä, and Rattenhuber (2017) for example, discuss one possible dimension of behavioural change when implementing a revenue-neutral expansion of social protection for Ghana. The role of administrative efficiency and capacity for the implementation and thus the cost of implementing different reforms is also an ongoing research area relevant to our work. Transparency and clarity of social protection rules is another important area of research as the study by Wright, Leyaro, Kisanga, and Byaruhanga (2017) shows. Finally, deepening the comparability across countries, including more countries and addressing the discrepancies between income vs consumption based distributional measures remain high on the research agenda.

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APPENDIX

Table 10: Expenditure on the universal pension, income-based countries, scenario 2

	Ecuador			South Africa		
	Reform1 ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL	**Reform1** ≥60, 50%NPL	**Reform2** ≥70, 50%FPL	**Reform3** ≥60, 50%WBPL
As share of GDP (in %)	0.38	0.07	0.25	0.11	0.02	0.04
As share of government revenue (in %)	1.00	0.18	0.65	0.30	0.05	0.11
As share of total direct tax receipt (in %)	9.36	1.64	6.12	0.66	0.11	0.25
Expenditure on universal pension (in millions)	389.34	68.39	254.63	4194.51	698.30	1592.36
As share of closing the poverty gap in age group (in %)	659.44	155.29	380.32	32.43	12.22	12.31
As share of the existing means-tested pension (in %)	138.69	24.36	90.70	6.97	1.16	2.65

Source: Authors own calculations.

Notes: NPL=National poverty line, FPL=Food poverty line, WBPL=World Bank $3.10 a day line. In the calculations of closing the poverty gap we use NPL. All monetary values in national currency units.