

# Micro-Pensions in Sub-Saharan Africa: The Solution to Population Ageing?

François-Xavier Albouy

*Research Director,  
Chaire "Transitions démographiques, Transitions économiques",  
Fondation du Risque - Institut Louis Bachelier, France*

Mathieu Noguès

*Research Assistant,  
Chaire "Transitions démographiques, Transitions économiques",  
Fondation du Risque - Institut Louis Bachelier, France*

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## **Abstract**

As micro-pension scheme experiments develop through Sub-Saharan Africa, theory and economic literature remains relatively scarce in comparison. Hence, answering "Micro-Pensions in Sub-Saharan Africa: The Solution to Population Ageing?" is not possible - or not yet. This paper is a call for more consideration on ageing in Sub-Saharan Africa and for the development of economic literature concerning micro-pensions as a solution to this issue. The first part consists in an introduction on the perspective of this study. The second part studies the phenomenon of global population ageing showing it also takes place in Sub-Saharan Africa. However, ageing would not be an issue if revenues were secured for the elderlies. Consequently, the third part is dedicated to the elderlies' income: how it is an important economic and social issue for Sub-Saharan African societies and the vulnerability of old-age revenue streams in contemporary context. The fourth part focuses on micro-pension schemes as a solution, in particular through existing case studies in Sub-Saharan Africa. The last part is a conclusion suggesting areas for further studies.

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# 1 Introduction

Micro-pension schemes are developing in Sub-Saharan Africa in recent years as a solution to population ageing in Sub-Saharan Africa. Such initiatives, such as the development of microfinance before, seems to be beneficial for individuals and, more broadly, for Sub-Saharan societies. By providing adequate pension scheme supply, they would increase old-age economic and social security and their households'. Thus presenting a solution to a market failure due to many factors including urbanization and informal sector importance.

However, implementing such policies requires consistent methodology. First because, as experienced with microfinance, some good ideas sometimes, in specific contexts, may turn bad. Also, any policy or financial product should be well designed, tested and monitored in order to avoid failure. And, as long as micro-pension schemes are about lifelong income - savings arbitrage, they run on the long to very long term since their creation. For this reason, it is critical that they should be well planned since their designing.

It is the aim of economic, social and anthropological literature to provide elements for policy makers and private sector companies willing to develop micro-pensions schemes as adequate as they can be. In our view, economic literature on micro-pensions in Sub-Saharan Africa is still scarce compared to the size of the issues of population ageing and securing the elderlies' income in Sub-Saharan Africa. This paper sums up these issues and selects literature in order to clarify this challenge, suggesting areas for further studies in order to allow the best development for micro-pension schemes in Sub-Saharan Africa.

## 2 Global population ageing: Sub-Saharan Africa is next

Population ageing is a global long-term demographic phenomenon raising economic, social and political short-term issues. This dynamic must be estimated through different indicators in order to have a more precise knowledge of the phenomenon. Empirically, as population ageing is known to be quite advanced in developed economies, developing countries are following the same dynamics. Sub-Saharan Africa, usually referred to as the young continent, is included in this process on the long term.

## 2.1 Indicators to measure population ageing

Different indicators of population ageing exist, each giving different information on the phenomenon. In this paper, four indicators will be considered. The first indicator is the median age of the population, which gives a global idea of the process of ageing in the society as a whole. The second indicator is the old-age dependency rate. The old-age dependency rate is the ratio between the elderly, considered as dependant, and the workforce. It is a major indicator when considering intergenerational equilibria in revenues, savings and assets including, in our case, pensions and the equilibrium of a pension plan. In this paper, the dependency age is set at 65 years-old. Therefore, the old-age dependency rate is set as the ratio between population aged 65 or more and population aged 15 to 64. The third indicator is the life expectancy at old ages. This indicators retraces two major aspects concerning pensions: the expected duration of an individual retirement and the longevity risk, the risk that this duration was undervalued. This indicator is key for the financial tuning of a pension plan. This paper will consider life expectancy at age 65. The fourth indicator is the fertility rate which is an indicator of the future dynamics of the population through generations to come.

The demographic transition is the transition from a high-old-age-mortality and high-fertility regime to low-old-age-mortality and low-fertility regime [Calot & Sardon, 1999]. This transition implies deep changes of the demographic pyramid, thus a population ageing. Concerning our indicators, the life expectancy at old ages and the fertility rate are dynamic indicators of population ageing whereas the median age and dependency ratio are static indicators of population ageing. Considering the demographic pyramid, the median age of the population would be the barycentre, the old-age dependency rate is the ratio between the top and middle, the life expectancy at old age is the future design of the top and fertility rate is the design of the bottom – and future design of the upper floors of the pyramid.

## 2.2 A worldwide global ageing

All of the demographic indicators we are using [section 2.1] show a global population ageing. According to the UN World Population Prospects [UN, 2017], the median age in the world increased from 21.9 years in 1975 to 29.6 years in 2015 and should reach 41.6 years in 2100, almost doubling in a century. The old-age dependency ratio growth is even more important, increasing from 9.7% in 1975 to 12.6% in 2015 and 37.6% in 2100. This figure would mean that, on a worldwide scale, there would be only three employed for one elderly. The same observation

can be made for the life expectancy at age 65, growing from 13.3 years in 1970-1975 to 16.6 years in 2010-2015 and 21.8 years in 2095-2100. Currently, the life expectancy at age 65 is slightly higher for women (17.8 years) than for men (15.3 years) with a difference of 2.48 years. This gap should remain stable on the very long term, according to UN projections. The fertility rate follows the same ageing process, decreasing from 3.9 children per woman worldwide in 1970-1975 to 2.5 in 2010-2015 and 1.97 in 2095-2100. This last figure highlights the fact that, according to the UN World Population Prospects, global population would be close to 2.05 children per woman, the population replacement level.

This phenomenon of ageing population is well-known and advanced in developed countries. In Western Europe, the demographic transition began in the nineteenth century. The static indicators of population ageing in more developed regions are quite important (median age of 41.1 years and old-age dependency ratio of 27.7% in 2015) but the dynamic indicators decelerated, even though still showing an ageing trajectory. On the opposite, less developed regions are still young considering static indicators, but are ageing when referring to dynamic indicators. Asia, Latin America and the Caribbean have begun their demographic transition in the late twentieth – early twenty-first century, with dropping fertility rates and increasing life expectancy at age 65.

### **2.3 Young Sub-Saharan Africa is getting old**

Sub-Saharan Africa is ageing too. Even though the common issues raised in Sub-Saharan Africa concern the youth, education, healthcare, feeding or even peacekeeping. In fact, Sub-Saharan Africa is, and will remain for long, the youngest continent. But the Sub-Saharan African population, still young, is ageing: the fertility rate is beginning to drop from 6.6 children per woman in 1975-1980 to 3.9 in 2025-2030 and 2.1 in 2095-2100, and life expectancy at age 65 has an accelerating growth. To sum up, the old-age dependency ratio should remain stable around 6% from 1950 to 2025 and then increase to 9.6% in 2050 and 22.9% in 2100. The number of elderly will be very significant: from 13.1 million people aged 65 or more in 1975, this figure is 41.3 million people in 2015 and expected to reach 150.6 million people in 2050 and 652.4 million people in 2100. The demographic transition is taking place in the continent, on the long run.

Africa is ageing at different paces. On a sub-continental scale, Northern and Southern Africa have begun their demographic transition since the late twentieth century. In these regions the median age is above 25 years in 2015, and the dependency ratio gets close to 10%. In East-

Table 1. Ageing population indicators

Indicator type	Static										Dynamic					
	Median age (years)					Old-age dep. ratio (%)					Life expectancy at 65 (y)			Fertility rate (child./woman)		
	1975	2015	2050	2100	1975	2015	2050	2100	1975	2015	2050	2100	1975	2015	2050	2100
World	21.9	29.6	36.1	41.6	9.7	12.6	25.2	37.6	13.3	16.6	19.3	21.8	3.9	2.5	2.2	2.0
More dev. regions	30.9	41.1	45.4	47.1	16.7	26.7	46.0	53.8	14.6	19.1	22.8	26.7	1.9	1.7	1.8	1.9
Less dev. regions	19.3	27.8	34.8	41.0	6.9	9.7	22.3	35.7	12.1	15.4	18.5	21.1	4.6	2.7	2.3	2.0
Africa	17.6	19.4	24.8	35.2	6.0	6.2	9.6	22.9	11.3	13.4	16.1	18.9	6.6	4.7	2.9	2.1
-Northern Africa	17.7	25.0	32.1	41.2	7.3	8.4	18.8	35.3	12.6	15.0	18.3	21.5	6.2	3.3	2.3	2.0
-Sub-Saharan Af.	17.6	18.3	23.8	34.6	5.6	5.6	8.1	21.5	10.9	12.9	15.3	18.5	6.8	4.8	3.0	2.1
-Eastern Africa	16.9	18.0	24.8	36.0	5.6	5.6	8.6	25.0	11.5	14.2	16.6	20.0	7.1	4.9	2.8	2.1
-Middle Africa	17.9	17.1	22.4	34.4	6.0	5.7	7.2	20.8	11.3	13.3	15.5	18.7	6.7	5.9	3.2	2.1
-Northern Africa	17.7	25.0	32.1	41.2	7.3	8.4	18.8	35.3	12.6	15.0	18.3	21.5	6.2	3.3	2.3	2.0
-Southern Africa	18.9	25.5	33.5	43.0	6.6	7.6	15.2	36.6	11.5	13.3	16.0	19.7	5.2	2.6	1.9	1.8
-Western Africa	18.0	17.9	22.6	33.0	5.3	5.3	7.0	17.6	10.0	11.3	13.3	16.3	6.9	5.5	3.3	2.2
Asia	20.1	30.3	39.7	46.1	7.1	11.2	27.8	46.3	12.2	15.8	18.7	21.8	4.1	2.2	1.9	1.8
Europe	32.1	41.6	46.6	47.8	17.8	26.4	48.7	54.6	14.4	18.3	22.0	26.1	2.0	1.6	1.8	1.8
Latin America	19.1	29.2	41.1	49.2	7.6	11.4	30.5	57.8	13.7	18.1	21.7	25.1	4.5	2.1	1.8	1.8
N. America	28.8	37.9	42.4	45.6	16.3	22.3	37.2	50.3	15.4	19.5	23.3	26.7	1.8	1.9	1.9	1.9
Oceania	25.5	32.8	37.4	43.8	12.2	18.5	29.4	43.7	14.3	19.8	22.6	25.5	2.7	2.4	2.0	1.9

Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, custom data acquired via website.

Table 2. Ageing population indicators, 2015=100

Indicator type	Static										Dynamic							
	Median age (years)					Old-age dep. ratio (%)					Life expectancy at 65 (y)			Fertility rate (child./woman)				
	1975	2015	2050	2100	1975	2015	2050	2100	1975	2015	2050	1975	2015	2050	1975	2015	2050	2100
More dev. regions	75	100	110	115	63	100	172	201	76	100	119	140	112	100	106	112		
Less dev. regions	69	100	125	147	71	100	230	368	79	100	120	137	170	100	85	74		
Africa	91	100	128	181	97	100	155	369	84	100	120	141	140	100	62	45		
-Northern Africa	71	100	128	165	87	100	224	420	84	100	122	143	188	100	70	61		
-Sub-Saharan Af.	84	100	130	189	100	100	144	383	84	100	118	143	141	100	62	43		
-Eastern Africa	94	100	138	200	100	100	154	446	81	100	117	141	145	100	57	43		
-Middle Africa	105	100	131	201	105	100	126	365	85	100	117	141	114	100	54	36		
-Northern Africa	71	100	128	165	87	100	224	420	84	100	122	143	188	100	70	61		
-Southern Africa	74	100	131	169	87	100	200	482	86	100	120	148	200	100	73	69		
-Western Africa	101	100	126	184	100	100	132	332	88	100	118	144	125	100	60	40		
Asia	66	100	131	152	63	100	248	413	77	100	118	138	186	100	86	82		
Europe	77	100	112	115	67	100	184	207	79	100	120	143	125	100	113	113		
Latin America	65	100	141	168	67	100	268	507	76	100	120	139	214	100	86	86		
N. America	76	100	112	120	73	100	167	226	79	100	119	137	95	100	100	100		
Oceania	78	100	114	134	66	100	159	236	72	100	114	129	113	100	83	79		

Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, custom data acquired via website.

ern Africa, the demographic transition has a more moderate pace, both considering increasing life expectancy at age 65 and decreasing in fertility rate. In Middle and Western Africa, the transition is later and smoother. As the life expectancy at old ages is increasing, the fertility rate remains high and should not decrease significantly. However, the old-age dependency ratio in these regions should reach 10% only by 2075, then doubling to 2100.

### **3 Getting old and poor in Sub-Saharan Africa? The issue of the elderlies' income**

The dynamic of ageing raises the parallel matter of guaranteeing revenues to elderlies. The concern of the elderlies' income represents direct and indirect economic and social issues. The direct issue, of course, is their standard of living and, in particular, their risk of poverty and bad health condition. Old age poverty is a significant issue in developing countries, including material conditions and more specific features such as access to markets, basic services, and social networks [Barrientos, Gorman & Heslop, 2003]. In particular, poverty risk for older could be more important than for younger adults, as observed in Anglophone West Africa [Ogwumike & Aboderin, 2005].

The indirect issues are the effects on global community, beginning with their grandchildren. The elderly have a prominent role in Sub-Saharan African societies. Many studies show the positive influence of the elderly in income spending decisions by the household. They tend to allow more budget for food and their grandchildren's education [Hauser & Warren, 1997, Erola & Moisiu, 2006]. At the opposite, if the elderlies are not able to satisfy their own needs, they can become a burden for their households. The positive effect of elderly role is even more important for pension provided to elder women. Providing pensions to women rather than men has a better influence on their grandchildren's health [Thomas, 1990] and granddaughters' condition [Duflo, 2003].

Furthermore, due to conflicts and epidemics – in particular HIV –, the generation of adults has been much impacted, inducing high mortality or dependency. In these cases, the elderly have to take in charge their grandchildren, including feeding, taking care of and educating them [Kakwani & Subbarao, 2005]. In other contexts, unemployment for the youth can leave the elderly as sole income provider in the household [Kâ et al., 2016].

Therefore, it is critical to provide the elderly with a revenue. Elderly incomes originate from different sources: labour income, pensions, intergenerational solidarity and savings or financial savings through the financial system. Unfortunately in Sub-Saharan Africa, these sources seem to be fragile considering the socio-demographic trends, putting at risk the elderly's incomes.

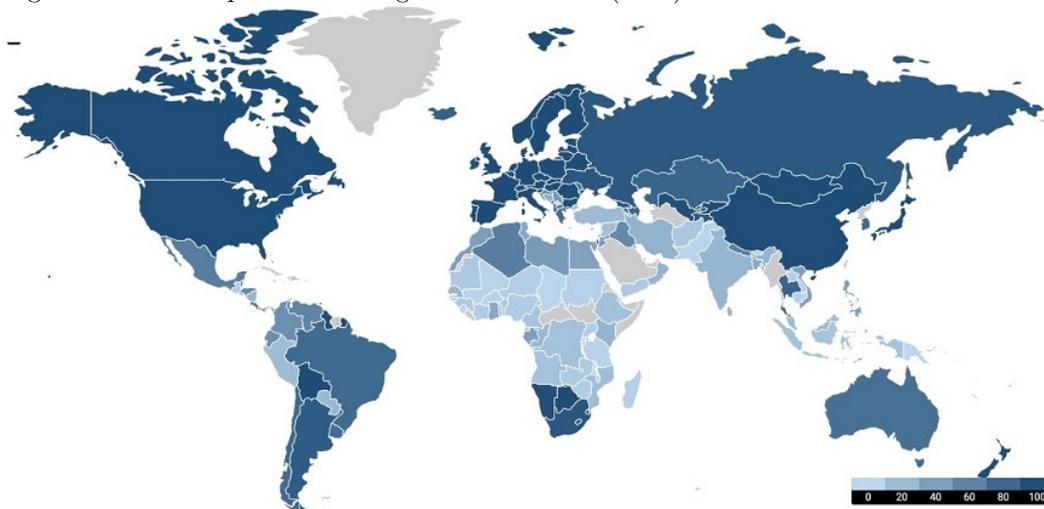
### **3.1 Labour income, ageing and health deterioration, a vicious circle**

The first income to consider is the income earned from an economic activity. It is inevitable that, for medical reasons, these revenues decrease with age. And, as described in section 2, Sub-Saharan African elders are getting older and older, thus risking a loss of earning power from professional activity [Wang et al., 2014]. The life expectancy at old ages is increasing significantly which means that elderly can become a financial burden in their households. As we mentioned, the life expectancy at 65 years-old, even the life expectancy at 80 years-old increased from 4.1 years in 1955 to 6.2 years in 2015 and is expected to reach 9.6 years in 2100 in Sub-Saharan Africa [UN, 2017]. If this increase in life expectancy is not complemented with social security or intergenerational care, labour income could cover less and less of the individuals' life-cycle needs, thus further worsening the elderly's health status, etc.

### **3.2 No pension for old man: which government would care about informal workers' future?**

Sub-Saharan Africa has the least effective pension coverage rate in the world according to the International Labour Organization (ILO), with a 22.7% pension coverage rate for the region (based on 41 countries) [ILO, 2017]. The effective pension coverage rate is defined as the share of old-age people beneficiary of a pension among all old-age individuals. It is the UN Sustainable Development Goal (SDG) indicator 1.3.1 for older persons. This figure includes different realities. The effective pension coverage ranges from 0.9% of total population (Sierra Leone) to 100% (Botswana, Mauritius, Seychelles). More importantly, the distribution is concentrated on the bottom: half the countries have a pensions coverage inferior to 10% of total population, and only one fourth of Sub-Saharan countries covers more than 34% of their total population. This situation has two major causes: the lack of concern towards ageing policies from governments and the importance of the informal sector.

Figure 1. Effective pension coverage rate worldwide (in %)



Source: ILO (International Labour Office). World Social Protection Database, based on the Social Security Inquiry (SSI).

Table 3. Effective pension coverage in Sub-Saharan Africa (in %)

Coverage rate	Countries	Nb.
0% - 10%	Benin, Burkina Faso, Burundi, Chad, Côte d'Ivoire, Guinea, Guinea-Bissau, Madagascar, Malawi, Mali, Mauritania, Niger, Nigeria, Mozambique, Rwanda, Sierra Leone, Tanzania, Uganda, Zambia, Zimbabwe	20
10% - 34%	Angola, Cameroon, Congo, Dem. Rep. Congo, Djibouti, Ethiopia, The Gambia, Ghana, Kenya, Mozambique, Senegal, Togo	12
34% - 85%	Gabon, Sao Tome and Principe	2
85% - 100%	Botswana, Cabo Verde, Lesotho, Mauritius, Seychelles, South Africa, Swaziland	7

Source: ILO (International Labour Office). World Social Protection Database, based on the Social Security Inquiry (SSI).

### 3.2.1 Ageing in Sub-Saharan Africa is a minor political concern

As Sub-Saharan Africa is ageing, the question is: are Sub-Saharan African governments concerned? And do they take actions to address this challenge? As we mentioned before, the continent had many issues that were considered priorities in political agendas.

Though, ageing became a concern in Sub-Saharan Africa at the beginning of the twenty-first century. In developing countries, this issue was treated and propositions were made since the 1980's, beginning with the 1982 UN World Assembly on Ageing, and its "Vienna International Plan of Action on Ageing". This plan of action set a number of propositions on how to face ageing through policies on health, social participation, economic security and other criteria. This initiative was followed by the 1987 UN International Symposium on Population Structures and Development, and on more specific topics, the UN Conference on Ageing Populations in the context of urbanization (1988) and the family (1990). The year 2002 was a key moment for international ageing policies in Sub-Saharan Africa. In April, the United Nations set up their second "International Plan of Action on Ageing", in Madrid, with a contribution of the World Health Organization [WHO, 2002]. This summit was followed, in July 2002, by the African Union's "Policy Framework and Plan of Action on Ageing". This summit and related publication show the dawn of a global concern on ageing in Africa.

On the State level, only seven countries had a social security for the elderly in 1972 in Sub-Saharan Africa (South Africa, Burundi, Equatorial Guinea, Guinea, Mauritius and the Dem. Rep. of Congo) [Mouton, 1975] and eighteen more countries set it up until 1984 (Cameroon, Central African Rep., Congo, Côte d'Ivoire, Benin, Ghana, Burkina Faso, Kenya, Lesotho, Liberia, Madagascar, Mali, Mauritania, Niger, Uganda, Tanzania, Togo and Zambia) [Midgley, 1984].

For more recent years, the concern and measures of ageing policy by the States can be approximated with the UN Population Policies Databases indicators on ageing. The first indicator shows the concern of the country towards population ageing. The second indicator checks which and how many measures were adopted to address population ageing in the past five years. This measures include: (1) raise of the minimum retirement age; (2) raise of the social security contributions of workers; (3) introduction or increase of non-contributory old-age pensions and (4) promoting private savings schemes for retirement.

Table 4. Sub-Saharan African countries' concern and actions on population ageing in 2015

	No measures	1 measure	2 measures	3 measures	4 measures
Not a concern	Djibouti, Eq. Guinea, Lesotho	Cameroon, Egypt, Niger			
Minor concern	Angola, Botswana, Burkina Faso, Chad, Congo, DR Congo, The Gambia, Guinea, Guinea-Bissau, Lybia, Mali, Marocco, Swaziland, Togo	Gabon, Malawi, Mauritania, Namibia, Nigeria, Zambia	Kenya, Senegal	Ethiopia	
Major concern	Benin, Cabo Verde, Mozambique, Rwanda, Seychelles, Tunisia, Tanzania	Algeria, Madagascar, South Africa, Zimbabwe	Côte d'Ivoire, Ghana, Uganda		Mauritius

Note: "measure" = measures adopted between 2010 and 2015.

Source: World Population Policies databases, Population Division, Department of Economic and Social Affairs, United Nations, 2015.

These indicators show that most countries have minor concern on ageing issues, and the trend remains quite stable. Interestingly, from 2005 to 2015, more countries lowered their concern than increased it. For example, Lesotho, Egypt and Niger were of "minor concern" in 2005 and "not concerned" in 2015. When looking more closely at the situation, two remarks can be made. First, Egypt and Niger implemented measures to address population ageing (promotion of private schemes in Egypt and raise of social security contributions of workers for Niger). Second, the overall social and political situation put ageing aside. Concerning Lesotho, the pension coverage rate is 94% according to the ILO. These examples show that these indicators should be interpreted with care: a minor concern towards population ageing can arise from a lack of interest of a big issue, or because the issue is being well-addressed already.

Nevertheless, population ageing remains a minor issue for Sub-Saharan African countries, and less than half of them took measures to address it in 2010-2015. There are four

Table 5. Sub-Saharan African countries' concern on population ageing in 2010 and 2015

	Not a concern in 2015	Minor concern in 2015	Major concern in 2015
Not a concern in 2010	Djibouti		
Minor concern in 2010	Egypt, Lesotho, Niger	Angola, Botswana, Burkina Faso, Congo, Eritrea, Ethiopia, The Gambia, Guinea, Guinea-Bissau, Lybia, Malawi, Mali, Mauritania, Morocco, Namibia, Nigeria, Swaziland, Togo, Zambia	Benin, Seychelles, Tunisia
Major concern in 2010		Equatorial Guinea, Gabon, Kenya, Senegal	Côte d'Ivoire, Cabo Verde, Ghana, Madagascar, Mauritius, Mozambique, Rwanda, South Africa, Uganda, Tanzania, Zimbabwe

Source: World Population Policies databases, Population Division, Department of Economic and Social Affairs, United Nations, 2015.

reasons for this lack of concern according to [Kalasa, 2001]. The first is that the majority of the population is rural, and the elders have a predominant social role in rural economies, and would never be left behind by the others (household, family, village or community). The second is the low old-age dependency rate. The third is that States invest in the long-term productive potential of the youth rather than the income of elderlies. The last is the perceived reluctance to change from elders.

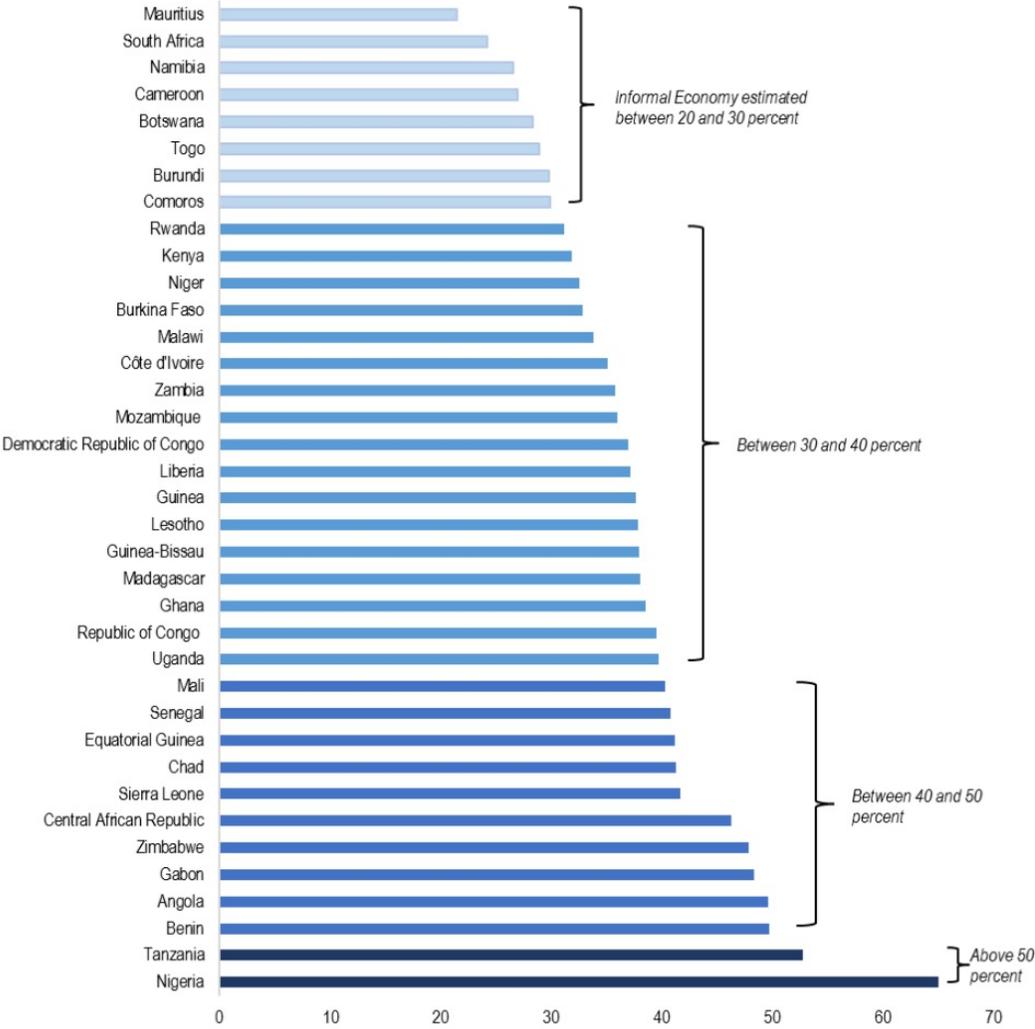
### **3.2.2 Importance of the informal sector and difficulty to develop social security**

The core question concerning pensions in Sub-Saharan Africa is: how to create efficient and widespread pension systems in mostly informal economies? In fact, most of the African economies have an important share of informal jobs, from independent agricultural workers to urban service workers. This consideration brings to the following question: how to define the informal sector?

The informal sector has many definitions. In this paper, the definition by Feige (2005) will be used: the informal sector are the economic activities that circumvent costs and are excluded from the benefits and rights incorporated in laws and administrative rules covering property relationships, commercial licensing, labor contracts, torts, financial credit and social system [Feige, 2005]. In order to quantify it, we use data from the IMF [Medina, Jonelis & Cangul, 2017].

According to the IMF, Sub-Saharan Africa has the second-most important informal economy share in GDP, at almost 40% of GDP, after Latin America and the Caribbean (over 40%). This high share of the informal economy across the region shows high country-level heterogeneity, ranging from 20% (Mauritius) to 65% (Nigeria). The pre-eminence of informal economy is related to the economic structure of the country: oil exporters have a mean of almost 50% of GDP in informal economy while it stands at 40% in low-income countries and 35% in middle-income Sub-Saharan countries. The trend shows a small decline of the share of the informal sector in Sub-Saharan economies between 2010 and 2014 (-4 pp) [Medina, Jonelis & Cangul, 2017]. As the definition of the informal sector varies according to countries, papers and methodologies, these figures tend to be in the lower range of informal sector estimates for Sub-Saharan Africa.

Figure 2. The informal Economy in SSA, 2010 to 2014 average as a Share of GDP (in %)



Source: Medina L., Jonelis A. & Cangul M., 2017, "The Informal Economy in Sub-Saharan Africa: Size and Determinants", International Monetary Fund, Working Paper 17/156, p. 30

### 3.3 Intergenerational solidarity put at risk at the Urban Era

Intergenerational solidarity is the other main source of revenues, including broader security and care for the elderly [Odundo, 2008]. But this stream is weakening too. Social change in Sub-Saharan Africa is deeply modifying intergenerational links. It weights on old age security, in particular in terms of care [Apt, 2002]. Not only are the elderly in lack of revenue, but they could represent a burden for the younger individuals in their families to take care of them. [Apt, 2002] insists that Sub-Saharan countries should not copycat social security systems from the industrial countries, as the administrative and social organisation is deeply different. They should develop their own model.

Urbanization is an important driver of these changes. In fact, urbanization in Sub-Saharan Africa is taking up at important pace. In 2015, Sub-Saharan Africa is still predominantly rural, with a 41.2% rate of urbanization, while the worldwide urbanization rate is 53.9% [UN, 2018]. Once again, Northern and Southern Africa are specific, with a high urbanization rate (resp. 51.4% and 62.1%). At the opposite, only one fourth of Eastern Africans lives in urban areas. This gap should be narrowed quickly, as the continent is expected to get over the 50% urbanization rate in 2035 - especially in Eastern Africa. This rapid urbanization results in environmental and social problems, including the modification of intergenerational links [Yamashita, 2017].

Table 6. Urbanization in Sub-Saharan Africa

Year	2015		2035		2050	
Indicator	Rate	Growth	Rate	Growth	Rate	Growth
World	53.9	2.04	62.5	1.45	68.4	1.13
Sub-Saharan Africa	38.8	4.14	49.8	3.47	58.1	2.89
Eastern Africa	26.6	4.55	37.5	3.98	47.1	3.28
Middle Africa	47.9	4.31	59.0	3.61	67.0	2.93
Northern Africa	51.4	2.31	57.2	1.96	64.1	1.76
Southern Africa	62.1	2.33	71.6	1.43	77.2	1.02
Western Africa	44.5	4.27	56.3	3.38	63.8	2.82

Note: "rate"=% of population living in urban areas; "growth"=growth rate of urban population.

Source: Urban/Rural Population database, Population Division, Department of Economic and Social Affairs, United Nations, 2018.

### 3.4 Lifecycle savings facing low financial inclusion

The last main stream of revenue for the elderly are revenues from savings, and broadly financial inclusion. Financial inclusion is an issue for it is associated with an important increase in income for the poorest quintile of the population [Beck, Demirgüç-Kunt & Levine, 2007]. Of course, this factor can be considered for individuals able to build up savings. For many individuals in Sub-Saharan Africa, the willingness to build up financial savings is not sufficient. According to the World Bank, only 12% of individuals saves at a financial institution in Sub-Saharan Africa in 2012 [Demirgüç-Kunt & Klapper, 2012]. An additional 22% of individuals saves using other methods, in majority community based savings methods, such as rotating savings and credit associations. This consideration is particularly important in Western and Central Africa, where community-based savings are widely used. In these regions, other methods are also commonly used: asset accumulation such as gold, land [Alcala & Koshy, 2007] or livestock, saving “under the mattress” or social bounds.

The barriers to financial inclusion are several: administration, distance to the individual, financial prerequisites from institutions (in assets and/or income). Other socio-anthropological barriers can be added: the gender and, in our case, the age. Even when all the barriers can be overcome, the credit and insurance products were not always adequate to the situation, because of their amount, maturity or rigidity.

The development of microfinance in Sub-Saharan Africa has shown to be a solution to a number of these barriers [Faye & Triki, 2013]. In particular, it is more widespread in rural area, and proved to adapt financial products for local demand [Miller et al., 2010]. In addition, it improved social inclusion for women, adapting the type of collateral or fostering group loans. Other forms of financial innovation increased financial inclusion in Sub-Saharan Africa, including mobile banking. The main example is the M-Pesa mobile money transfer technology in Kenya. Introduced in 2007, it had transferred the equivalent of 10% of Kenya’s GDP after only 2 years of existence and is the main driver of financial inclusion in Kenya [Mbiti & Weil, 2016].

Concerning pensions, low financial inclusion in pension plans is also associated to the informal sector, because of the nature of informal employment. The important jobs turnover,

dominantly as a self-employed person, the heterogeneous nature of the employment social contract and scarce financial literacy in informal sector prevents them from accessing pension plans [Uthira & Manohar, 2009]. Could micro-pension schemes be a solution?

## 4 Micro-pension schemes as a solution for Sub-Saharan Africa?

Micro-pensions systems are not a single product but vary according to time and context. However, general characteristics can be underlined. Micro-pensions are essentially voluntary, defined contribution, funded schemes. Individuals are offered to pay contributions while working with no frequency basis (e.g. each week, month or year), or at a regular frequency but with a very low minimum contribution. According to the amount of these contributions, the individual will be able to perceive a pension around the age of 60, either in a lump sum, phased withdrawal, annuity, or a combination [Asher & Shankar, 2007].

### 4.1 A few experiments and emerging economic literature

Literature and experiments on micro-pensions remain relatively limited. As the definition of micro-pension plan is not precise, the concept of micro-pensions can take several forms, including and excluding different schemes according to the authors. For example, the micro-pension schemes in Bangladesh and India are based on the Grameen model, China insists on minimum income and life insurance, South African informal workers are covered by the public pension system and Kenya has a voluntary defined contribution scheme supported by the government and micro-pensions in Uganda are provided by the private sector [Hu & Stewart, 2009]. A crucial feature is that micro-pension plans must adapt to local demand, including the distribution channel. For this purpose, the development of microfinance institutions or mobile money banking have been a crucial technology for micro-pensions' development.

Micro-pension schemes have to face three main risks as for their financial sustainability. The first risk, as any pension plan face, is the longevity risk. The longevity risk is the risk to underestimate the life expectancy of retired individual, therefore providing a pension too expensive for the pension system's sustainability. The second risk is the inflation risk: in funded

schemes, the contributions are invested for the future pension of the individual. Therefore, the return on investment must be at least equal to inflation, other way the individual would have inter-temporal loss on its savings. This risk can be associated to economic growth risk in pay-as-you-go schemes. The third main risk, specific of micro-pension schemes, is the volatility of contributions. This is of considerable importance if the scheme is designed as a pay-as-you-go pension scheme: volatile revenues from voluntary contributions should, in this case, guarantee the payment of a stable amount of benefits to the insured elderly that previously contributed - even if the scheme works as a defined contributions scheme.

The major example in terms of experimentation, duration and literature is India. India integrated the concept of micro-pensions in its social security scheme since 2006 in order to increase the pension coverage rate [Asher & Shankar, 2011]. Many studies were conducted on micro-pensions in India, on the positive effects for beneficiaries [Mitchella & Mukherjeeb, 2017], in particular women [De Bruijn & Van Dullemen, 2014] and the optimal design of the pension scheme [Asher & Shankar, 2007]. This paper will not focus on the Indian experience, noting that it has been a major influence for the development of Sub-Saharan African micro-pension schemes, both theoretically and on the field, with adaptation.

In Sub-Saharan Africa, micro-pensions have been developing in more recent year, and with different typologies of micro-pension schemes. Among the most important initiatives, some are integrated into government pension administration, such as the Mbao Pension Plan in Kenya in 2009, the Micro-Pension Plan in Nigeria in 2014 [Uzoh & Anekwe, 2018], and the Long-Term Saving Scheme (or Informal Sector Pension Scheme) in Rwanda in 2016. Some more private sector driven initiatives also took place such as the People's Pension trust in in Ghana in 2016 or the Mazima Retirement Plan in Uganda in 2017.

## **4.2 Looking for the perfect micro-pension scheme: three case studies from Kenya and Ghana**

This study will focus on two Sub-Saharan countries: Kenya and Ghana. Specific literature on impact study of the uptake and scheme of micro-pension plans is still scarce in Sub-Saharan Africa. One reason is that micro-pension plans are quite new in this region. Therefore, the results on the elderly are difficult to quantify. While most countries adopting such schemes have developed it since 2014, Kenya is an exception, implementing micro-pensions since 2009.

#### 4.2.1 Kenya and the Mbao Pension Plan

The Kenyan micro-pension system is the Mbao Pension Plan, launched in 2009 as an Individual Pension Plan, and more widely in 2011, targeting Small and Medium Enterprises. The aim was to reach the informal sector workers, representing 80% of Kenyan workforce [Nyakundi, 2009]. The “Mbao” terminology refers to the 20 Kenyan Shillings participators have to contribute each day. It is a partner model, with private financial service providers (owned by the Kenya Commercial Bank) dealing with the clients, in partnership with the government (Retirement Benefit Authorities, RBA). The benefits can be accessible after 3 years only, or later, according to the age of entry of the member. The service is accessible via the mobile money transfer service provider M-Pesa. Contribution through M-Pesa can be made in 8 simple steps [RBA, 2019].

The first paper we will use to sum up micro-pensions in Kenya used is [Agravat & Kaplelach, 2017]. This study focuses on the informal sector, more precisely a sample of 71 respondents out of a sample of 96 informal employees, among the approximately 2,500 informal employees of the Kenya Ports Authority (KPA). The study has three objectives: to establish the effect of (i) financial literacy, (ii) income level and (iii) socio-demographic profiles of individuals on micro-pension scheme participation among the informal sector employees of KPA. The methodology adopted is descriptive survey design.

The second study is [Njuguna, 2012]. The study adopts a broader approach, trying to underline factors for the success of micro-pension plans at two different levels: (i) demand-side participation in a micro-pension scheme and (ii) supply-side strategies. To estimate the effects on demand-side, the sample is broader in number and targeting. There were 1083 respondents, through 8 provinces of Kenya. On the supply-side, 50 institutions were questioned, including 30 MFIs and 20 Savings and Credit Cooperative Societies. The pension scheme suggested is a partner model, as the Mbao Pensions Plan. The methodology adopted is descriptive survey design.

#### 4.2.2 Ghana, anticipating future micro-pension plans in urban areas

The case study used for Ghana is [Kuwornu & Tsegai, 2013]. The authors examine the factors influencing urban informal workers’ participation in a micro-pension scheme. The sample focuses on 400 informal workers in Accra, capital city of Ghana. The methodology used

is a binary logit regression analysis on the probability to participate in a micro-pension scheme through sociodemographic, income, assets and savings characteristics. More precisely, the study evaluates the probability of participation in an hypothetical micro-pension scheme. In fact, in 2013, there was no pure micro-pension scheme in Ghana.

Government established the Informal Sector Fund in Ghana in 2008, in order to provide social security for informal workers. This product is a voluntary scheme in which half the contribution are paid for an occupational scheme account and the other half for a retirement account. Therefore, [Kuwornu & Tsegai, 2013] use an hypothetical micro-pension fund using the same scheme, with 100% contributions going into the retirement account. Since this study, a pure micro-pension scheme has been set, the People Pension's Trust (2016).

#### **4.2.3 Results from the case studies: financial literacy, income level, investment and the State**

The objective of this case study is to try to highlight what could be global features, valid for any micro-pension scheme, and local features, that must adapt to local context. Of course, as the methodology is different for each paper, the results are not comparable as such. Therefore, the following tables are a lead for further research, in order to guide, validate or invalidate them.

The following tables show the results of the selected papers according to demand- and supply-side features. The studies are not perfectly comparable, as using different methodologies, but they were chosen for their similar perspectives and as they treat many common features for demand-side specifications. Only [Njuguna, 2012] treats supply-side factors methodologically.

Table 7. Case studies results on the demand-side: willingness to participate in a micro-pension scheme

Category	Criteria	Agravat & Kaplelach, 2017 (Kenya)	Njuguna, 2012 (Kenya)	Kuwornu & Tsegai, 2013 (Ghana)
Socio-demographic	Household size	Negative	/	Negative
Socio-demographic	Age	Positive	None	Positive
Socio-demographic	Marital status	Negative	/	Positive, important
Socio-demographic	Member of a work related association	/	/	Negative, important
Education, psychology	Financial literacy	Positive, Most important	Positive, important	/
Education, psychology	Trust	/	Positive	/
Income, savings	Income level	Positive, important	Positive, most important	None
Income, savings	Income stability	Positive	Positive	/
Income, savings	Made investments	/	/	Negative, most important
Income, savings	Pay tax	/	/	Positive, important
Supply-side	Adequate supply	/	Positive	Positive, important

Note: "/"=the authors did not study this specific feature.

Source: authors' papers.

Table 8. Case studies results on the supply-side: how to make a micro-pension scheme work?

Criteria	Njuguna, 2012 (Kenya)
Administrative costs	Negative, most important
No regulatory framework	Negative, important
Legibility for the client	Positive, important
Financial literacy among the clients	Positive, important
Client's saving habits	Positive
Relations between the fund and stakeholders	Positive

Note: [Agravat Kaplelach, 2017], [Kuwornu Tsegai, 2013] did not cover supply-side. Source: [Njuguna, 2012]

### Global demand-side features

These results are interesting as they underline common features. Financial literacy seems to be the most important factor for the participation in micro-pension schemes, confirming most of the rest of literature on pensions and micro-pensions.

Concerning others educational and psychological features, the level of trust of the individuals towards the system has a positive impact. It can be related to financial literacy. The adequacy of supply has a positive important influence on micro-pension development, as expected.

Looking at income and savings, [Kuwornu & Tsegai, 2013] find that the most important factor for the willingness to participate in a micro-pension plan is the absence of other investments. The authors explain that investing would be substitutable to a pension, on the respondent's view. Kenyan workers indicate that they would only participate in a pension plan if they have enough income to subsidy for their household needs and, possibly contribute to a micro-pension scheme. The fact of paying taxes is another important factor for [Kuwornu & Tsegai, 2013], and could be linked to a higher income. Lastly, income stability is another important factor.

Looking at socio-demographic factors, the household size has a negative impact. This can be interpreted in different ways. One is that, as the individual must provide for the needs

of more people, thus cannot make additional contributions to a micro-pension scheme. Another is the perennial importance of family, the individual considering that the household will provide care in the future. [Kuwornu & Tsegai, 2013] find that being a member of a work related association in Accra, Ghana, has an important negative effect on the decision to join a micro-pension scheme.

### **Local demand-side features**

Even though the majority of features studied in different papers go the same direction, some vary according to the papers. This could be the track to determine some more local features that has to be treated ad hoc. Again, as methodologies used are different, these comparisons are highlighted but must be confirmed with specific literature in order to asses them for sure.

The marital status is interesting for it is the only feature showing opposite results: it has an important positive impact according to [Kuwornu & Tsegai, 2013] and a negative impact according to [Njuguna, 2012]. Also, considering socio-demographic features, the younger respondents are, the less they are willing to contribute in [Agravat & Kaplelach, 2017] and [Kuwornu & Tsegai, 2013]. Whereas for [Njuguna, 2012], age has no influence.

The income level looks to be very important in [Agravat & Kaplelach, 2017] and [Njuguna, 2012]; but not in [Kuwornu & Tsegai]. This features is indeed very important. If the income level matters, meaning that the individual should earn a minimum income in order to engage in a micro-pension scheme, micro-pensions could not be the solution to take the poorest out of their poverty trap. Only the individual or households just above an income level could secure future revenues through micro-pensions.

The underlying question behind these results is: are they due to cultural differences between Kenya and Ghana? Or methodology? Or another factor? Further research is needed to better understand these specific issues.

### **Supply-side features**

When considering supply-side factors, the MFIs and Savings and Credit Cooperative Societies underline the importance of administrative costs and, to a lesser extent, transaction costs in Kenya. Good relations between the fund and stakeholders is also a feature increasing

the success of micro-pension supply. Legibility of the product and scheme for the client, its financial literacy and savings habits are also important positive incentives as perceived by the supply-side, in accordance with demand-side considerations. The last element is the importance of the regulatory framework.

This last feature underlines the importance of the State for the development of micro-pension schemes. Government action on micro-pensions can be direct, by providing micro-pension schemes. It can also be indirect, providing a regulatory framework, or increasing financial literacy among the population through local government or mass media [Agravat & Kaplelach, 2017].

## 5 Conclusion and areas for further studies

### 5.1 Concluding remarks

Population ageing is taking place worldwide, including in Sub-Saharan Africa. This process began after the ageing of Europe and Northern America, or other developing countries in Asia, Latin America and the Caribbean. It will also take longer, when looking at the demographic pyramid. However, the process seems to be inevitable, and ageing "on top" of the pyramid will be massive on the short to medium term. This means that Sub-Saharan Africa will have to carry on with more and more old-age individuals, that will eventually have a growing weight in its demographics.

Providing income to the elderly is important not only for their own economic and health security, but also for the wider community due to the importance of family in Sub-Saharan African societies. But revenue streams are at risk: labour income should decline with increasing life expectancy, public pension policies are not the priority even more considering the difficulty to reach informal sector workers, intergenerational solidarity wanes with urbanization going on and income from financial savings remains modest because of low financial inclusion, partly due to the lack of adequate supply.

Micro-pensions could be a good answer to these issues. By providing flexible conditions, micro-pension schemes can be adopted by any kind of worker in order to better anticipate their old-age security, and their households', as our case study shows. Also of considerable importance is the role of financial literacy, almost systematically underlined as a factor of willingness to

participate in micro-pension. Factor that can be addressed in effective and not-so-difficult ways.

Micro-pension schemes seem to be only at their dawn in Sub-Saharan Africa. These countries traditionally got inspired by European and Northern-American social security systems, not always appropriate to local context. Micro-pension schemes provide them with a new model, much more adequate for their specificities, whether economic, social or political. However, economic literature seem to be modest compared to micro-pension schemes potential, suggesting areas for further studies.

## **5.2 Areas for further studies**

Our suggestions for further studies consider two developments: an improvement in literature and study the development of new features in micro-pension schemes.

### **5.2.1 Improve literature in order to answer the research question**

The literature on micro-pensions in Sub-Saharan Africa has promising foundations but needs to be increased in different ways, mostly considering (i) internal validity and (ii) external validity. These improvements should allow economic literature to answer the research question raised: can micro-pensions be a solution to population ageing in Sub-Saharan Africa.

#### **Improve internal validity**

First, economic literature must increase the internal validity of these studies. The internal validity is how reliable a study is, its intrinsic robustness. In order to improve it, consistent methodology should be used in terms of impact study. [Kuwornu & Tsegai, 2013] could be a good example to follow as they use a logit binomial model, allowing to differentiate effects between variables and their level of significance. Moreover, samples should be widened in terms of observations, reaching at least minimum observations to use the selected model, and prepared in order to minimize samples biases.

#### **Improve external validity**

Second is the external validity. The external validity is the possibility to widen conclusions to other contexts. Many points can be improved in order to give micro-pension literature external validity. As for the samples, the widening of socio-demographic features of observed

individuals is imperative, in particular concerning the urban/rural dichotomy.

Another field of research, considering external validity, is the development of a multi-country analysis using the same methodology. In this case, international comparison will be possible. This would be the opportunity to better understand objective factors of uptake and effects of micro-pensions and, at the opposite, local and specific factors.

Furthermore, in the countries where micro-pension schemes are already implemented already, studies on supply-side (pension scheme design) and demand-side (individual uptake) must be systematically carried on, in order to better identify the different factors. These considerations are specifically important because pension schemes are on the long to very-long term, more difficult to modify, thus need a rigorous follow-up since the beginning.

Lastly, studies of uptake in micro-pension schemes in countries where such schemes do not exist yet should be made. Knowing about the existing studies and experiments would allow to set a theoretical framework that can be tested as greenfield experiments or studies.

### **5.2.2 Test new micro-pension features**

Many challenges and ideas stands in the micro-pensions field. Here are some features we propose in order to address specific issues on micro-pensions. Of course, these ideas will have to be deepened in further studies, challenged, and, if relevant, tested.

#### **Increase participation through investment targeting**

Considering funded micro-pension plans, a pertinent focus would be to specifically analyze the reaction of individual in the adoption of a micro-pension plan according to the way funds are invested. For example: would individuals be more interested in a micro-pension plan investing in international investments (bonds) or, at the opposite in the national or very local economy? Or aren't they sensitive to this factor as long as they feel the micro-pension scheme is sustainable?

### **Increase the scheme's financial sustainability using demographics**

Another interesting feature would be to link economic growth due to demographics and the sustainability of micro-pension schemes. As stated in section 2, Sub-Saharan Africa is ageing but still benefits from vivid demographic situation for a few decades. This demographic potential represent an opportunity to finance future ageing. Our idea is to establish a public micro-pension fund, that would be funded by the demographic growth. For example, for each GDP growth percentage point and government revenue earned from the demographic factor, one tenth of it would be used to fund the public micro-pension scheme.

### **Increase participation and financial sustainability improving long-term commitment through public involvement**

Long-term commitment is an important issue in Sub-Saharan Africa. The region suffers from important economic and financial risks linked to political instability or prices and monetary uncertainty. Thus, individuals could be quite reluctant to participate in long term savings schemes. On the supply-side, IMFs, Credit Cooperative Societies or other private sector actors can be unwilling to assume the financial risk on their own. A solution could be to involve governments in micro-pension schemes through matching contributions: for each contribution made by the individual, the State would contribute the same amount in the individual's account. This feature could be combined with parliamentary control or supervision over the scheme.

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