Vulnerability of young and old people in Senegal:

Is Remittances Trend Sustainable in Senegal

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ABSTRACT

Various economic programs implemented in Senegal have not yet sufficiently supported in real economic growth to meet the social demand. Indeed, the incidence of poverty remains high and hit mainly the rural population. The question one might ask is whether the inelasticity of economic policies against social demand is related to the lack of research tools or poor targeting.

This study makes an apology a methodology that links macroeconomic aggregates and demographics. It can account for all the problems of the economic analysis of the demographics of a country, integrating the concept of life cycle and demographic dividend.

The results highlight that the evolution of the first demographic dividend (growth rate of economic support ratio) in Senegal is negative since the 50s until 1998. But from 1998 the rate grow up and will continue until the year 2025. From 2026, this ratio will enter a phase of gradual decline.

The average lifecycle deficit (LCD) in Senegal for 2005 is positive between ages 0-35years and 60 years and over. Between 0 to 35 years, remittances are the main source of consumption followed by the reallocation of assets. Reallocation of assets is the main source of funding for the lifecycle deficit of the elderly (60 years and over).

Introduction

The last decade was marked by a financial, banking and debt crisis in most developed countries. To solve this crisis, the implementation of several strategies including recapitalization and grants to poor developing countries have been initiated. The crisis spread to developing countries through Official Development Assistance (ODA) and remittances from emigrants.

Remittances of migrants play an important socio-economic role in developing countries. According to De Bruyn and Wets 2006, remittances have become the second largest source of external funding for developing countries after FDI and

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ODA. In south Sahara Africa, the remittances amounts increased from 2.3 billion US $ in 1995 to 21.4 billion US $ in 2008. In the WAEMU zone transfers received amounted to 2.5 billion US $ in 2008, while ODA and FDI respectively amount to 5.2 billion US $ and 1.7 billion US $.

In recent years some work on the demographic dividend argued that the substantial decline in fertility is a necessary condition for profit (GRIBBLE and BREMNER, 2012). The realization of the fertility decline will result in significant investments in voluntary family planning, education especially for girls, health and gender equality.

The decline in fertility is an element of the demographic transition in addition to the change in mortality for the age structure of the population. Countries like Thailand have been able to put in a dynamic change in the structure of their population with a total fertility rate from 5.5 children per woman in 1970 to 2.2 in 1990 to $ 1.5 in 2010. This substantial reduction has allowed the country to move towards a pyramid-shaped bell reflecting a sharp decline in mortality and fertility extending the service life of the population of working age.

According to the work of Kamel Kateb in 2008, the Maghreb countries entering the second phase of the demographic transition and their dependency ratio will decline more. The opening of a demographic window will have a positive impact on the education system because the same budget for education will these families more ways to two children if they were five. With regard to marriage, he will have money to marry early because the nuclearization of households will strain budgets new facility couples who were once reduced by the coexistence of generations.

Among the works mentioned above, it should be noted that the report of the Economic Commission for Africa (ECA) in 2013 that the demographic dividend is a unique opportunity to experience rapid economic growth for many consecutive underdeveloped countries to change structure of the population. This change requires a sharp decline in fertility that gives a large population of working age and a reduction in the ratio of dependents (young and old). This situation increases the production and per capita savings and improves human capital. However, it should be noted that the operation of the demographic dividend is not automatic but the time factor.

The study by Jean Pierre Guengant on "Population, Development and Demographic Dividend" in Chad shows that population growth (3.5% per year) in this country could be one of the strongest in the region because of high fertility and low use of contraception. In relation to economic growth forecast to 5% per year against a population growth of 3.5% per year, it will take over 45 years to double per capita GDP in order to reduce poverty.

Furthermore, the report of the World Bank entitled "Remittances from migrants and Development: Lessons from Latin America" in 2009 pointed out that the positive effects of remittances include improved capacity savings, a reduction in poverty and

improvements in health and education indicators. In the same vein, Pamela Cox, Vice President of Latin America and the Caribbean at the World Bank noted that " it is impossible to ignore the role of remittances in the region accounting for nearly 70% of FDI and almost eight times greater than ODA received in this area. These transfers help poor families to improve their economies and send their children to school".

In 2007, the African Development Bank (AfDB) has prepared a study on remittances from migrants. This study covering four countries including Mali and Senegal, has made a statement of comprehensive inventory of financial flows from the diaspora. The results showed that in 80% of cases, remittance recipients are families near the poverty line and 60% to 85% of the remittances are allocated to final consumption for beneficiary households. Moreover, the share of transfers made for real investment is important and varies between 20 and 65% of remittances from migrants aged over 35 years.

In 2010, migrants have transferred $325 billion to their families in developing countries, an increase of 6% compared to 2009, according to official figures from the World Bank. This strong and sustained increase would not only reduce the budget constraints of households in developing countries like those on WAEMU zone but also generate positive effects on the economies of these countries receiving transfers and opportunities for productive investment.

The present paper aims to study the sustainability of remittances from Senegalese migrant workers in the long term. To this end, it will be structured around a synthesis of the results of the study on remittances from Senegalese emigrants, a benchmarking around some of african countries and a prospective study with respect to demographic dividend, the life cycle deficit and its financing. Finally, it will issue recommendations to advocate economic policies.

1- Litterature review

Remittances are sending resources to a migrant's country of origin. According to De Bruyn and Wets (2006), remittances have become the second largest source of external funding for developing countries after foreign direct investment and prior to official development assistance. But estimates from the results of the survey on remittances from Senegalese emigrants in 2011 shows that the showing transfers amounted to about 936 billion FCFA, which is four times higher, respectively, the amount of Foreign Direct Investment (FDI) and nearly twice the amount of Official Development aid (ODA).

In addition to their volumes more important, remittances to developing countries have the characteristic of being relatively stable thus less volatile and more direct than other financial flows such as ODA and FDI (Akpo and Youssoufou, 2008). In addition, in the macroeconomic plan, Bouhga-Hagbe (2006) show that remittances play an increasingly important role in the balance of payments of many developing countries and can contribute significantly to contain vulnerabilities in their external position.

Remittances of migrants are now a true force to be reckoned with in the global economy (Chami and al., 2008).

In some countries, remittances represent a substantial share of imports and GDP. Household surveys conducted in the recipient countries, which can take into account all types of transfers (formal and informal, monetary and in kind ...) confirm their importance for the recipient families (Rodriguez, 1996; Cox and al.; 1998; De Brière and al., 2002; Cox-Edwards and Ureta, 2003).

In addition, recent studies have shown that remittances from migrants are a useful and effective means of reducing poverty and income inequality (Baruah, 2006; Gupta and al, 2007; Chami and al, 2008; Diane and Diagne, 2009). They act directly on the income of beneficiaries by loosening their respective constraints. In the same dynamic, the Population Division of the Department of Economic and Social Affairs of the United Nations shows that remittances by emigrants towards sub-Saharan Africa has become a major socio-economic role because if they can overcome the weaknesses of family resources, particularly to meet the costs of current consumption, indirectly contribute to the financing of facilities and basic infrastructure in the territory of origin.

Thus, several studies on the fallen of remittances have shown their positive effect both at macro and micro level. But it should be noted that these transfers are becoming increasingly feasible and faster thanks to the development of information technology and communication have made their dramatic entrance in all areas and in all sectors including the financial sector. It is in this vein that Fidha and Charki (2005) show that ICT plays a positive role in the context of the quality of the customer relationship.

Level of monetary transactions interurban, Naiditch (2009) shows that the advent of ICT has completely changed the traditional mode of money transfer in Africa, which remains a highly developed because of the financial dependence of many rural populations vis-à-vis those in urban areas, and sometimes vice versa.

According to Freund & Spatafora (2008), transaction costs vary depending on the country of origin and destination of migrants, and are related to the lack of financial development and exchange rate volatility. To make a choice between the different channels of transfer of funds, taking into account the emigrant service accessibility (proximity, ease of use, convenience, authorized amounts, discretion, ..), its safety, its speed, reliability, diversity of services offered, and cost (Freund & Spatafora, 2005). The information technology and communication are thus at the center of remittances due to their advantages of speed and diversity. You can even add some cost reduction. Thus, the secure transfer and accelerate the time to send money are goals common to all players.

2. Methodology

2-1 Data Sources

The survey on remittances from Senegalese emigrants is a sample survey with a sample of 3400 households distributed throughout the territory. The sampling technique is a systematic sampling with probability proportional to size. Stratification was to pull within each environment department N District Census (DR). The size of the DR is the number of households in the DR.

The randomness is due to the fact that the drawing is done randomly using a computer drawing algorithms to automatically generate a random number. He draw for the DR is performed by the method of cumulative totals. This is a sub-sample of the Monitoring Survey Poverty in Senegal (ESPS). The frame is composed of DR are also from the General Census of Population and Housing 2002 (RGPH-2002). Note that DR is a well-defined geographical territory.

The database of survey on remittances from Senegalese emigrants is composed of 3400 households receiving funds. A questionnaire composed of several sections was used to collect the data. This questionnaire collects household and other information on the demographic and economic characteristics. The questionnaire also collects information on whether to use ICT and access to financial services.

The main parts of the questionnaire are: the geographical identification of the household and the list of household members and their socio demographic characteristics, housing conditions, assets and household expenses, the use of financial services by household members; migration and international transfers received from former household members; migration and international transfers received from people who have never been members of the household.

For this study, the work on the demographic dividend has been made by taking 2005 as the reference year. The data used to determine the deficit lifecycle basis are: National Accounts 2005, the social accounting matrix of 2005, ESPS1, TOFEs, and BDP   2005.
Moreover, the projection assumptions on net transfers to address the issue of the sustainability in the medium and long term were made by the Department of Money and Credit (DMC) on official transfers for the period 2007-2010.

Finally, the results of the national survey conducted by the Department of Money and Credit (DMC) in 2012 as part of the study on remittances from Senegalese migrant workers based on a sample of 3400 households.

2-2. Financing long-term growth in Senegal

This will address the theoretical model and analysis of the demographic dividend, the deficit of the life cycle and its sources of financing, the net credit transfers and long-term economic policy actions.

Theoretical Model

In terms of the theoretical model, we derive it from Bloom, Canning and Malaney (1999). Indeed, it is this model that is used in various versions in the analyzes on the effects of population dynamics on economic growth (Bloom et al, 2000, Bloom et al, 2008; Bloom and Finlay, 2009). This is a standard neoclassical growth model taking into account the evolution of the life cycle in relation to behavior change in terms of labor supply. It is implicitly based on the observation that all the inhabitants of a country not involved in the production activity.

We suppose a Cobb-Douglas production function like above :

$$Y = AK^{\alpha}L^{1-\alpha} \quad (1)$$

Y is the output or product, A total factor of productivity, K capital, L labor and α the elasticity of output to capital.

As in the case of endogenous growth models, we assume that capital accumulation is endogenous while total factor productivity converges to an equilibrium value. Under these assumptions, the equilibrium produced by worker is wrote as:

$$\left(\frac{Y}{L}\right)^* = A^* \left(\frac{K^*}{L}\right)^{\alpha} \quad (2)$$

It is further assumed that the equilibrium value of income per worker can be influenced by a set of variables that we denote X. These can influence A or capital per worker. These variables can include the extent of natural resources, geography, human capital, economic policy, etc..

Then with $z = \log(Y/P)$ we have :

$$z^* = X\beta \quad (3)$$

With Z * the equilibrium value of the output per worker, X is the matrix of variables affecting the equilibrium value of the total factor productivity and the value of capital per worker.
The regression equation resulting from this model assumes that the actual level of income per worker adjusts slowly to its initial level as follows:

$$g_z = \lambda(z^* - z_0) \quad (4)$$

g_z is the growth rate of the income per worker,

$z^* = \log\left(\frac{Y}{L}\right)^*$ the log of the equilibrium value of income per workerr,

$z_0 = \log\left(\frac{Y}{L}\right)_o$ the log of the initial income per worker and λ is the convergence rate to the equilibrium.

This equation indicates that the growth rate of a country is proportional to the distance between the initial level and its equilibrium level. This property is a standard neoclassical growth models in which the income of each country continually approach a limit to be determined by the characteristics of the country. It is known as conditional convergence. By combining the equilibrium equation with the adjustment process we obtain:

$$g_z = \lambda(X\beta - z_0) + \varepsilon \qquad (5)$$

ε is an error term.

This model is expressed as output per worker because it is the workers who enter on the production process. But we can express it in per capita using the following transformation:

$$\frac{Y}{P} = \frac{Y}{L} \times \frac{L}{P} \qquad (6)$$

Y is the income, P the population and L the labour force. By taking the logarithm of the above equation, we obtain:

$$\log\left(\frac{Y}{P}\right) = \log\left(\frac{Y}{L}\right) + \log\left(\frac{L}{P}\right) \qquad (7)$$

By posing $y = \log\left(\frac{Y}{P}\right)$ we obtain $y = z + \log(L/P)$ or $z = y - \log(L/P)$ (8)

In deriving the above equation we obtain that:

$$g_y = g_z + g_L - g_p \qquad (9)$$

g_y is the growth rate of per capita income , g_z the growth rate per worker, g_L the growth rate of labour force g_p the growth rate of the total population. Replacing the income growth rate per worker by its value from equation (5) in the previous equation we get:

$$g_y = \lambda X\beta - \lambda z_0 + g_L - g_p + \varepsilon \qquad (10)$$

According to equation (8) we have

$$z_o = y_0 - \log(\frac{L}{P})_0 \qquad (9)$$

Replacing this value in equation (10) we obtain the final model :

$$g_y = \lambda X\beta - \lambda y_0 + \lambda\log(\frac{L}{P})_0 + g_L - g_p + \varepsilon$$

3- RESULTS

This section focuses on some results including the total amount of transfers received in 2011 compared to FDI and ODA, the percentage of transfers through formal and informal channels, the share of transfers allocated to consumer spending and investment, the share of investment allocated to productive investment and distribution of transfers by place of residence of the migrant and expenditure level of education.

3-1 Volume of transfers in 2011

The national survey reveals that the transfers received from Senegalese emigrants is estimated globally to 936 billion CFA in 2011. This amount is more than four times the amount of FDI (220 billion CFA in 2011, according to figures from the DPEE) and about twice the volume of Official Development Assistance (ODA) (500 billion CFA francs in the same source). This situation was also observed in other countries including Morocco, Egypt and Cape Verde where remittances represent respectively six (6) times the IDE and four (4) times ODA almost five (5) both IDE and two (2) times the ODA and nine (9) and FDI (1) ODA (ADB, 2009).

These transferred funds come from the majority on emigrants from Diourbel (17%), Dakar (16%), Kaolack (15%), Thies (14%) and Matam (11%) which represent a share of 78% of total transfers received in Senegal. In contrast, the lowest share of remittances are recorded in emigrants from the Fatick (3%), Ziguinchor (4%) and Tambacounda (4%).

3-2 Money transfers channels

The results of the survey show that remittances from Senegal migrants use much more in the formal channel (80.8%) than the informal channel (19.2%) as shown in Figure 1. The formal channel is dominated by the use of the services like Western Union operators (64%) and Money Gram (12%) whereas on informal channel the funds pass through individual agents, friends and relatives. On average, the amount passing through the formal channel amounted to 815 000 F CFA per year against 290 000 F CFA in the informal channel.

Figure 1 : Money transfer channel
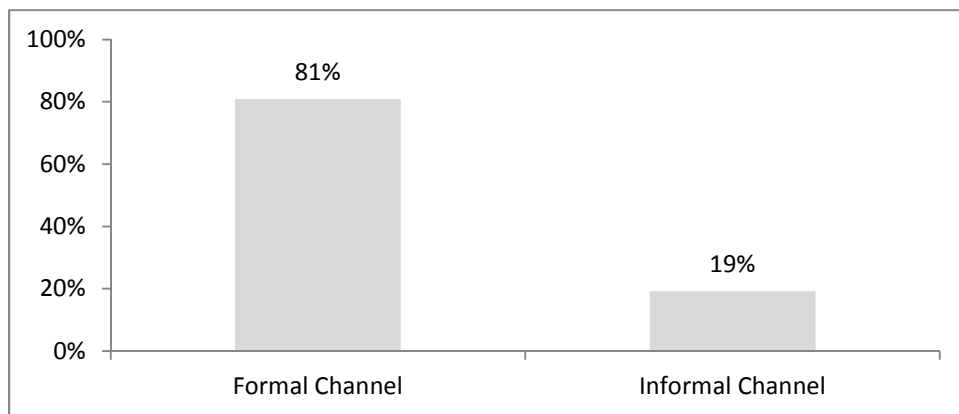
3-3 Use of Transfers receiving by households

The national survey found that remittance recipients spend 85.6% of amounts received in final consumption and 14.4% for investment. This supports the understanding that recipients of transfers allocate a large portion of the funds received from migrants for final consumption needs. About the amounts allocated to the investment, it appears that 64.5% of the 11,4% are use for productive investments.

3-4 Distribution of transfers by emigrant country of residence

According to place of residence of the migrant's remittances are mainly from Italy (28%), France (21%) and Spain (14%) or a combination of 63% of total shipments in Senegal (see Figure 2). The remaining proportions from Senegalese residing in the ECOWAS region (9.9%) and other African countries (14.2%).

Figure 2: Transfer by emigrant residence
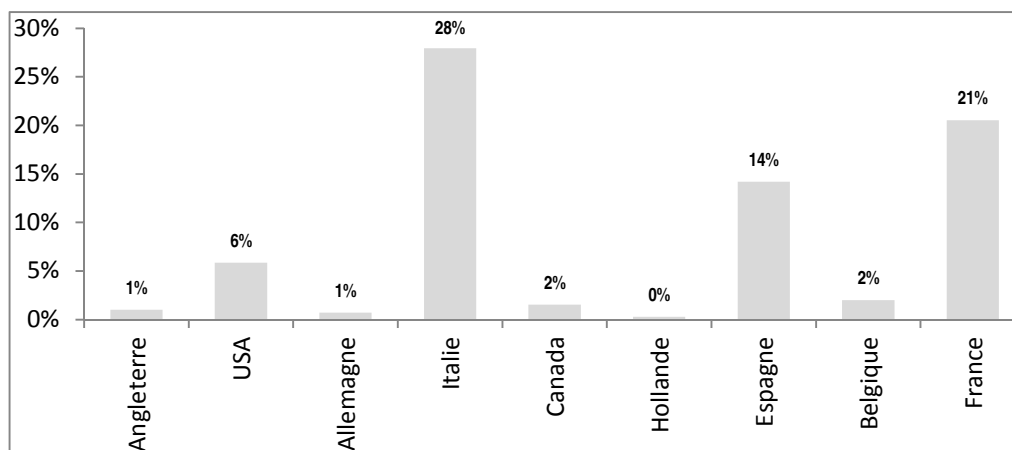
The analysis of the average annual amount of remittances shows that migrants residents from Belgium (979,000 CFA francs), England (894,000 CFA francs), Italy (779,000 CFA) and the U.S. (778 000 F CFA), who transfer more funds to households. Residents migrants from Canada, Holland and France transfer on

average between 630,000 and 690,000 CFA francs CFA and those of Spain and Germany less than 500 000 F CFA.

3-5 Distribution of transfers by education level

Analysis of the level of education shows that most of the funds (73%) are sent by emigrants who have a relatively low level of education (more than high school). However, it is clear that it is the immigrants with postgraduate level that send more money on average per year (1,556,000 CFA) that migrants without formal education level (612 000 F CFA).

4. Benchmarking

Benchmarking is performed by comparing four members of National Transfer Accounts countries (NTA), namely Nigeria, Kenya, Senegal and Brazil.
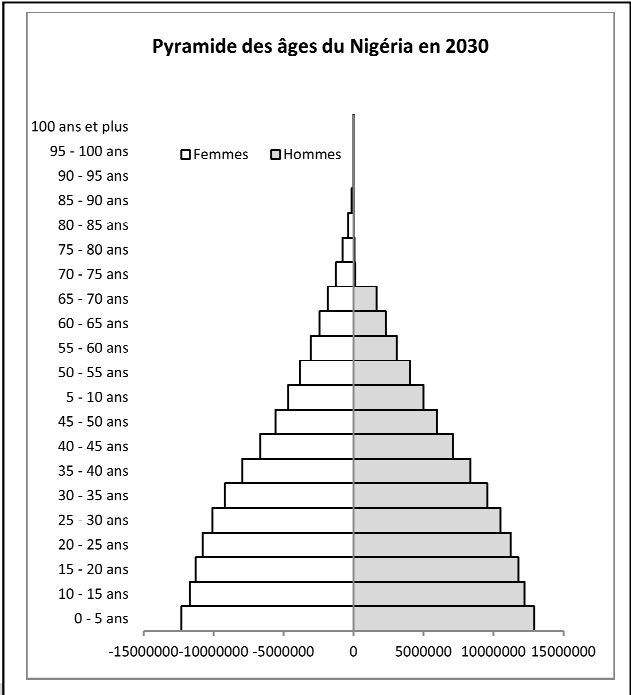
4-1 Age structure in Nigeria (2010-2030)

Figure 3 : Nigeria Age pyramid 2010
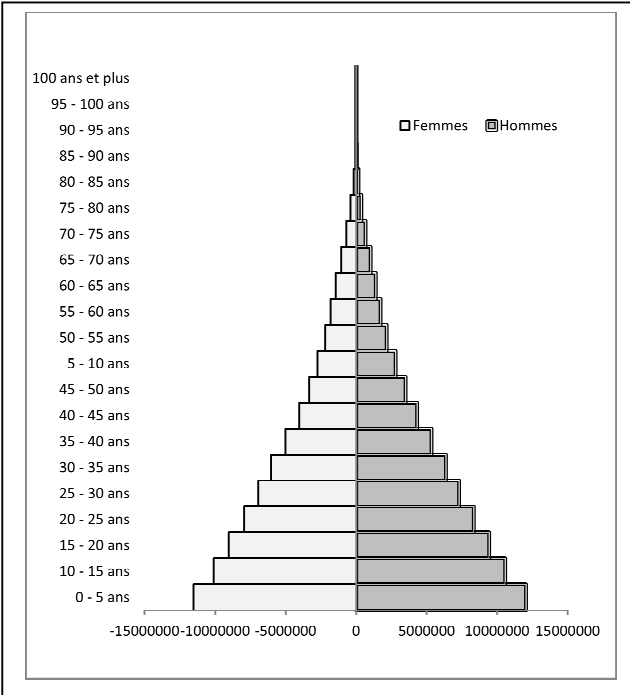
Source : Perspectives Monde

Figure 4 : Nigeria Age pyramid 2030

Source : Perspectives Monde

Table 1 : key demographic variables in Nigeria

	1980	1990	2011
Birth rate for 1000 hbts	47	44	40
Mortality rate for 1000 hbts	20	19	14
Fertility rate	7	6	5
Support ratio			
HDI	-	-	0,46

Source : Perspectives Monde

The age of Nigeria in 2010 shows that the country has entered the demographic transition even if it seems to be shy. From 1980 to 2011, birth rates and mortality rates have declined by 47 to 40 births per 1,000 inhabitants and 20 to 14 deaths per 1,000 inhabitants.

Projections for 2030 show that the downward trend will accelerate, which will give a pyramid tends to form a bell.
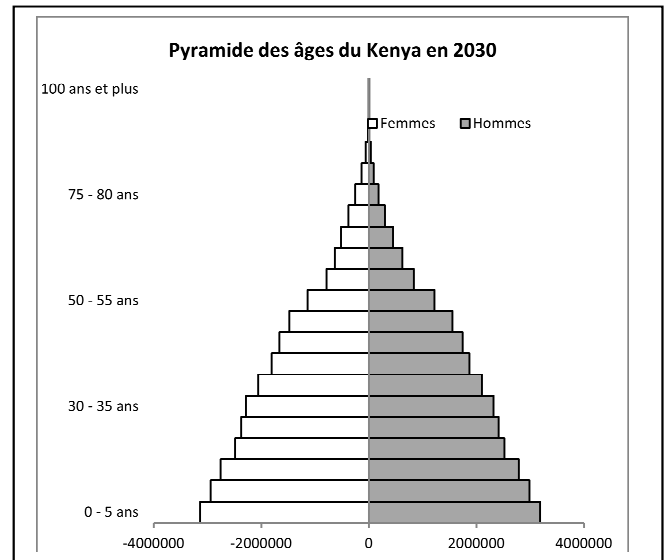
4-2 Age structure in Kenya (2010-2030)

Figure 5 : Age pyramid of Kenya 2010
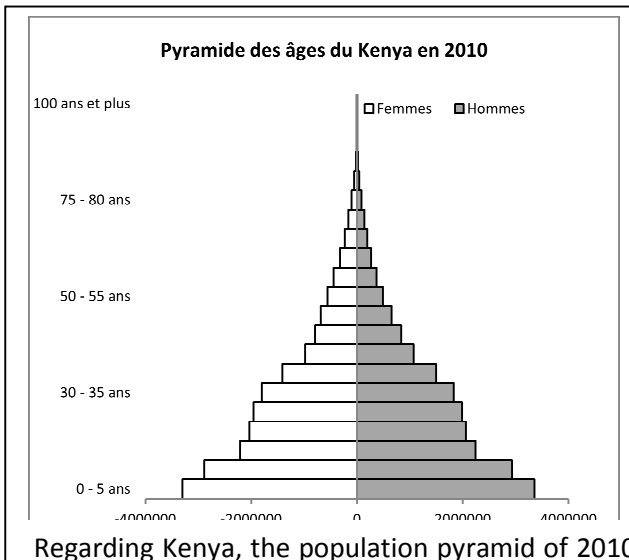
Regarding Kenya, the population pyramid of 2010 shows a start of the demographic transition with a certain shyness. If the birth rate has declined from 49 to 37 births per 1,000 people, the mortality rate is almost stationary.

However, the projections for 2030 point to a acceleration of this demographic transition directing the age to form a bell.

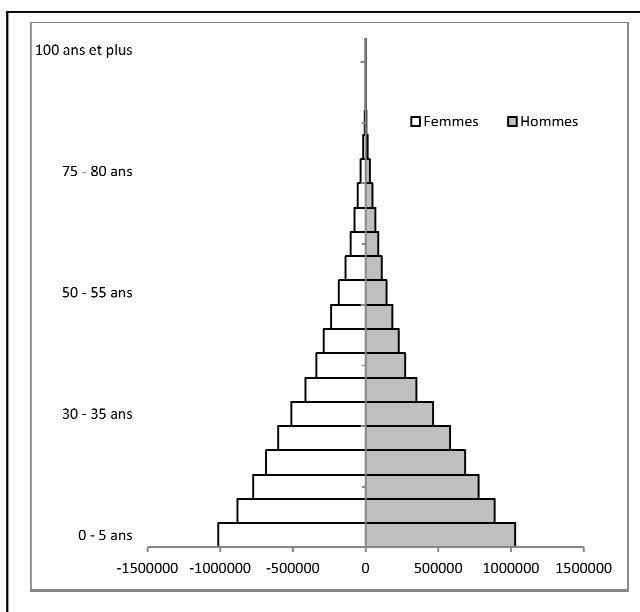**Figure 6 : Age pyramid of Kenya 2030**

	1980	1990	2011
Birth rate for 1000 hbts	49	42	37
Mortality rate for 1000 hbts	11	10	10
Fertility rate	7	6	5
Support ratio			
HDI	0,42	0,46	0,51

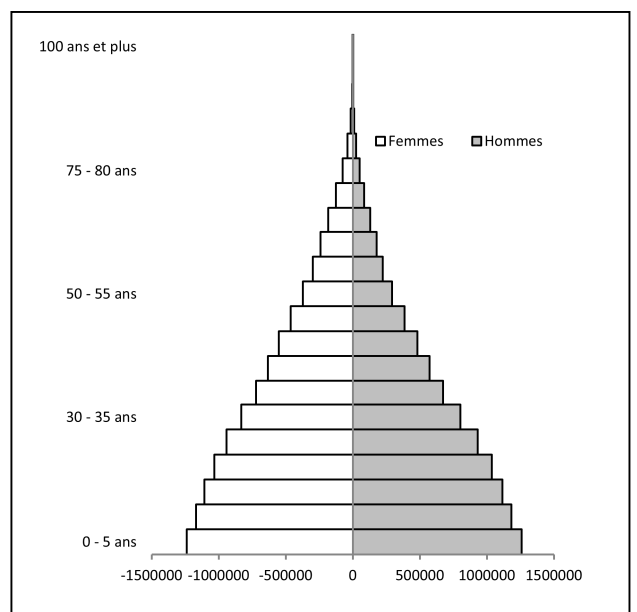Source : Perspectives Monde

4-3 Age structure in Senegal (2010-2030)

Figure 7 : Age pyramid of Senegal 2010

Source : Perspectives Monde

Figure 8 : Age pyramid of Senegal 2030

The pyramid age of Senegal in 2010 shows that the demographic transition began with the image of other countries. Birth rates and mortality rates have declined from respectively 48 to 37 births per 1,000 inhabitants and 18 to 9 deaths per 1,000 inhabitants.

Table 3 : key demographic variables in Senegal

	1980	1990	2011
Birth rate for 1000 hbts	48	44	37
Mortality rate for 1000 hbts	18	13	9
Fertility rate	7	6	5
Support ratio			
HDI	0,32	0,36	0,46

<u>Source</u> : Perspectives Monde

4-4 Age structure in Brazil (2010-2030)

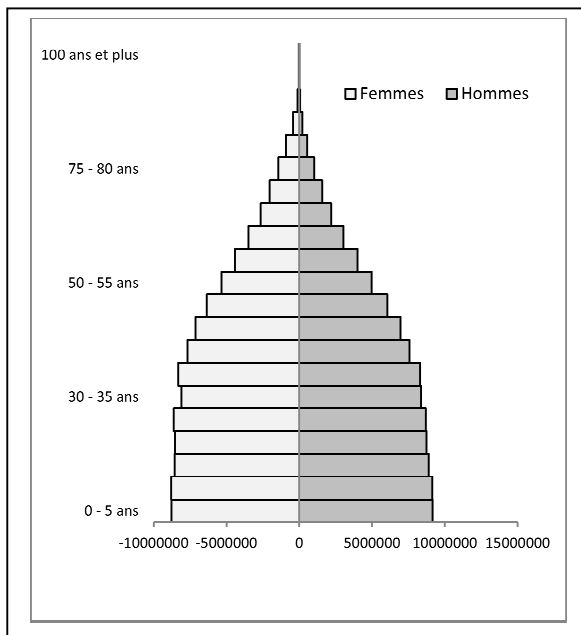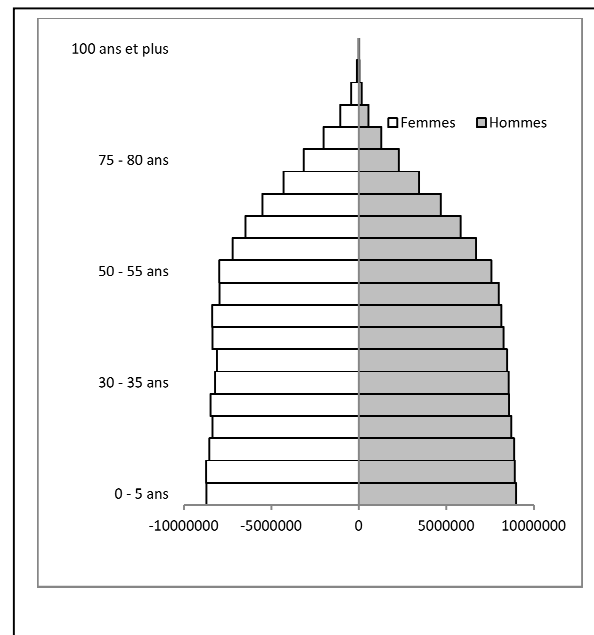**Figure 9 : Age pyramid of Brazil 2010**

Figure 10 : Age pyramid of Brazil 2010

The population pyramid of Brazil in 2010 began to take the shape of a bell. In this country the demographic transition took a large. Birth rates and mortality rates have fallen sharply. From 1980 to 2011, they went from 32 to 15 births per 1,000 inhabitants and 9-6 deaths per 1000 inhabitants.

Projections for 2030 show that the level of demographic transition will be developed and will tend towards that of developed countries.

Table 4 : Key demographic variables in Brazil

	1980	1990	2011
Birth rate for 1000 hbts	32	28	15
Mortality rate for 1000 hbts	9	7	6
Fertility rate	4	3	2
Support ratio			
HDI	0,55	0,60	0,72

Source : Perspectives Monde

The comparison of these four countries shows that Nigeria, Kenya and Senegal have almost the same pace of demographic transition in terms of the evolution of their birth rate, mortality and fertility. The pace of the demographic transition is shy in those countries where the fertility rate remains high average 5 children per woman. However, the outlook reflected in the projections of the pyramids in 2030 show that this rate will ramp up but will not allow him to reach the level of emerging countries such as Brazil.

Regarding Brazil, the status of emerging countries is through its demographic transition in which the three countries mentioned above will tend on average in 2030 than Brazil in 2010. In Brazil the birth rate, mortality and fertility rates fell sharply in 2010. Projections made in 2030 for Brazil show that the demographic transition will expand more to move towards that of developed countries.

The demographic transition potentially generates a demographic dividend corresponding to an opportunity offered to countries to accelerate economic growth. However, this requires significant investments, particularly in education, health and employment for profit. For this purpose, it should be noted that investments in human capital remains low in Nigeria and Senegal (less than 0.5 in 2011 HDI) medium in Kenya (HDI = 0.5 in 2011) and significant Brazil (HDI= 0.72 in 2011). This is why Nigeria, Senegal and Kenya must increase investment in human capital in the image of Brazil to take advantage of expected demographic dividend.

**5-Demographic dividend and life cycle deficit funding**

5-1 Senegal context

In spite of positive evolutions, Senegal must address several challenges before it can deliver the benefits of the Demographic Dividend:

1) Senegal's fertility rate went from 6.6 children per woman in 1986 to 5 children per woman in 2010. This decline is too slow to obtain the necessary changes in population structure.

2) The country's rapid population growth is generating a large population of working age youths with bleak employment opportunities.

3) Many young Senegalese workers find work in the informal sector or migrate to other countries (mainly in Italy, France and Spain) with precarious work conditions, thus generating losses in fiscal revenues for the government.

4) The sectors that support Senegal's economic growth are not likely to create more jobs. This is particularly true for the IT and trade sectors, which since the 2000's have largely contributed to the country's growth. In addition, these economic branches are known to favor capital rather than labor force and to have a strong potential for reducing work.

5) Senegal is facing important commercial imbalances and remains vulnerable to price fluctuations. Indeed, the Senegalese economy has been structurally in deficit since Independence. This economic dependency is linked to a consuming structure based on products such as rice, wheat and vegetable oils, which are all imported even though they are the primary consumer products in Senegalese households.

6) Poverty remains high in Senegal. The 2011 survey found that the poverty rate went from 51% in 2005 to 47%.

7) The weaknesses of institutional and regulation frameworks challenge the trust of both national and international investors.

8) Despite high access to education for children, school attendance and educational attainment remains low.

9) In general, gender inequality is omnipresent and curtails their full participation in society, from deciding how many children she will have to what the family will spend its scarce resources on. The persistence of important barriers to female education remain and limit the potential income-generating of Senegal's population.

5-2 Demographic dividend analysis

Figure 11 : First demographic dividend and GDP per capita growth
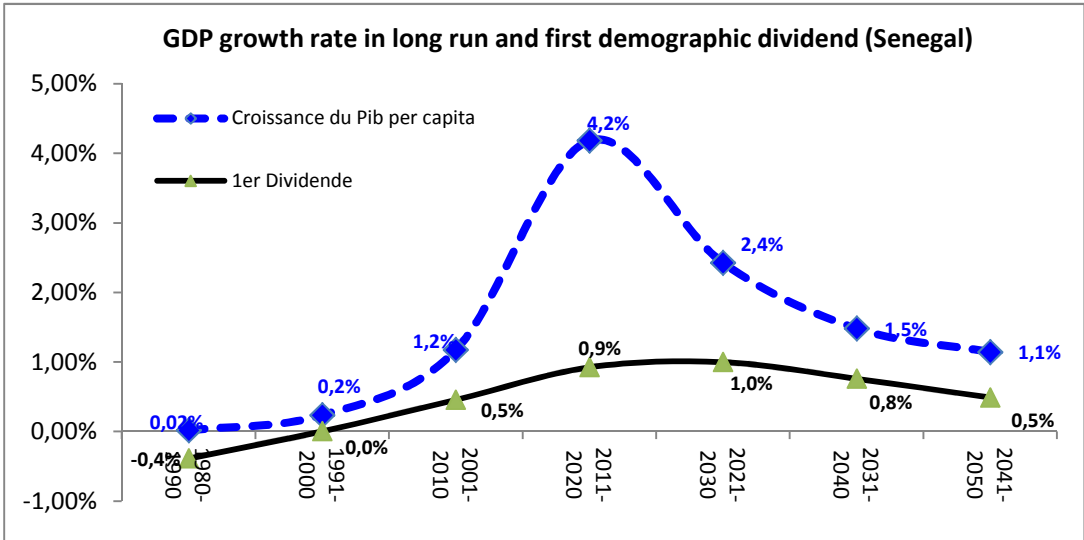
Source : Author estimation

The chart above shows that the contributions of the growth rate of productivity (second demographic dividend) and the growth rate in the dependency ratio (the first demographic dividend) in the formation of the growth rate of GDP per capita.

Over the period from 1980 to 1990, the growth rate of per capita averaged 0.02% due to the growth rate of productivity (0.4%) for the first demographic dividend is negative. From 1991 to 2000, the growth rate of GDP per capita (0.2%) equal to the second dividend reflecting that the first demographic dividend is null. This period marks the beginning of the phase of the demographic transition in Senegal marked by reduced fertility from 6.6 in 1992 to 5.7 children per woman in 97 (ANSD, 2012) as well as the reduction on maternal and infant mortality.

Furthermore, since 2000 the growth rate of GDP reach its maximum level (4.2%) in 2020. The similar trend was followed by the second demographic dividend which is fixed at its optimum (3.2%) in 2020. This shows that during this period the contribution of the second demographic dividend has dominated the composition of the per capita GDP growth rate, although the first demographic dividend has been a progression.

From 2020 to 2030, the per capita GDP growth rate and the second demographic dividend declined unlike the first dividend being at its optimum level (1%), reflecting that people of working age increase more than dependent (children and the elderly).

From 2030 to 2050, the first demographic dividend begins to decline while the per capita GDP growth rate and the second demographic dividend continue their

downward trend marking a beginning of an ageing population and a reduction in productivity.

5-3 How life cycle deficit is finance in Senegal

The NTA fundamental equation is obtain by equalizing all income inflows with all outflows income for a given age group. This equation is derived from the accounting identity stating that for a given economy, the sum of labor income, capital income and transfers received is equal to the sum of consumption, savings and transfers paid.

Inflows consist of labor income $Y^l(a)$, asset income $Y^a(a)$ and transfers received $T^+(a)$.

The outflows income consists of consumption $C(a)$, savings $S(a)$ and transfer payments $T^-(a)$ for a given age group (a).

$$\underbrace{Y^l(a) + Y^a(a) + T^+(a)}_{\text{Inflows}} = \underbrace{C(a) + S(a) + T^-(a)}_{\text{Outflows}} \quad \textbf{(A.1)}$$

$$\underbrace{C(a) - Y^l(a)}_{\text{Life cycle deficit}} = \underbrace{\underbrace{Y^a(a) - S(a)}_{\text{Asset Reallocation}} + \underbrace{T^+(a) - T^-(a)}_{\text{Nets Transfers}}}_{\text{Asset based Reallocation}} \quad \textbf{(A.2)}$$

Equation (2) highlights the lifecycle deficit (LCD) on the left and funding sources of LCD on the right. The funding source is represented by net transfers and Assets based reallocations. The following chart is for illustrative the results in Senegal for 2005.

Figure 12 : Life cycle deficit and financing source
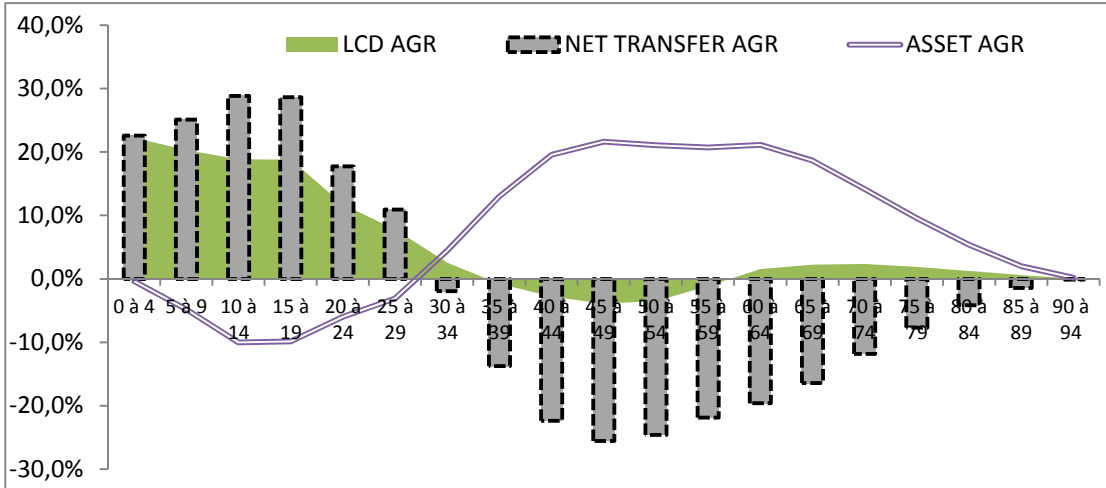
Source : Author estimation from NTA data

In 2005, the life cycle of the age group 0 to 90 years is negative for a total of 1627.7 billion CFA. The gap is generate by the age 0-35 years and 60-90 year. The age group 35 to 60 shows a surplus (see chart above). The deficit is financed by net surplus transfers of 609.4 billion CFA. By proceeding with segmentation, it appears

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that the life cycle deficit of the age group 0-30year is funded by the net assets and the age group 60 to 90 years by net transfers. These net transfers finance the life cycle deficit up to 37.4%, with 24.8% of net private transfers and 12.7% of net public transfers.

In 2010, the total lifecycle deficit stood at 2098 billion CFA for the age group of 0 to 90 years. This deficit is financed to the tune of 785 billion CFA by net transfers. Depending on the structure, it appears that the age group of 0-34 years and 60 years and over respectively were financed by net assets up to 621 billion CFA and net transfers up to 207 billion CFA. However, the age group 35 to 60 years has a lifecycle surplus about 254 billion CFA. 0 to 90 years, the need for net transfers to cover deficit financing lifecycle stood at 3553 billion CFA, or 74% of Gross Domestic Product (GDP).

In 2020, the life cycle deficit will set a total of 3670 billion CFA for the age group between 0 to 90 years. This deficit is funded by transfers totaling 1373 billion CFA. For age group 0-34 years and 60 and over, the deficit is financed respectively by the net assets for 1087 billion CFA and net transfers to 2245 billion CFA lifecycle deficit. Regarding the age group 0-90 years, the need for net transfers will be 6213 billion CFA, which represent 70% of GDP.

In total, the lifecycle deficit will amount to 5700 billion CFA in 2030 and will be financed by net transfers up to 2134 billion CFA. Indeed, the age group 0-34 years and 60 and over have a life cycle deficit financed respectively by the net assets up to 1688 billion CFA and 3488 billions CFA. In contrast, the age 35-60 group will conduct a lifecycle surplus to 691 billion CFA francs. From 0 to 90 years the need for transfers needed to finance the life cycle deficit will be 9650 billion CFA, or 72% of GDP.

The same trend will continue for 2040 where the life cycle deficit will be 7731 billion CFA financed by net transfers up to 2898 billion CFA. The age group between 0 to 34 year and 60 year and over have a deficit in their life cycle that will finance the net assets respectively to 2290 billion CFA and net transfers to 473 billion CFA. However, the age group between 35 to 60 years will generate a surplus of its life cycle up to 938 billion CFA francs. In total, net transfers to finance the life cycle deficit will be 13.088 trillion CFA which represent 73% of GDP.

5-4 Transfer Sustainability on long run

The sustainability of long-term transfer was studied on the basis of three scenarios.

The first scenario is based on an assumption of an average annual growth of 6.7% transfers calculated for the period 2007-2010.

The second scenario is based on a growth assumption of net remittances of an average annual growth rate of 7.5%.

The third scenario is based on an assumption of growth in net remittances at an average annual growth rate of 9%.

Based on the average annual growth rates, the projections are implemented on the period 2011 to 2050.

Table : Projections of Senegalese emigrants net transfers (in billion of CFA)

Year	Transfers	Transfers needed to finance the deficit of the life cycle	scenario 1 Hypothesis TCAM[3] = 1,067	scenario 2 Hypothesis TCAM :=1,075	scenario 3 Hypothesis TCAM = 1,09
2010	-2988	-3553	565	565	565
2020	-5132	-6213	1080	1164	1338
2030	-7585	-9650	2064	2400	3166
2040	-9141	-13088	3946	4946	7496
2050	-8980	-16525	7545	10194	17746

Source : Author estimations

It is clear from this simulation table that if nothing is done with the current level of growth in transfers corresponding to the average annual growth rate of 6.7%, net remittances can not finance the life cycle deficit of 0-90 years over the period 2010-2050.

Even an increase in the average annual growth rate of net remittances from 6.7% to 7.5% will also not cover the needs transfers to finance the life cycle deficit.

Senegal need an average annual growth rate of 9% of net transfers to cover the needs of transfers and financing life-cycle deficit in 2050.

This allows us to say that the transfers are not sustainable in the long term as needed to meet the need for transfers in financing life-cycle growth rate is not in line with the difficulties of the current international context which augurs more in addition to insecurity among immigrants and reducing their chances of remittances to their countries of origin.

As a reminder, the fundamental equation of intergenerational transfers accounts shows that the lifecycle deficit is financed through the reallocation of assets and net transfers. For this purpose make sustainable long-term transfers require action on the deficit of the life cycle and sources of funding in terms of economic policy recommendations.

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[3] TCAM : Average annual growth rate

6- Discussions

Changes in the age structure and fertility decline are necessary for the demographic dividend. These changes do not occur automatically, but governments, donors and policy makers can implement mechanisms to capture a battery of socio-economic policies and the demographic dividend through the decisions of avant-garde financing. This is among other things:

Create jobs in areas requiring a large labor

Implement policies economic growth and infrastructure improvements

- Investing in family planning and reproductive health. Governments must take the political and financial commitments necessary to ensure that the policies and programs of voluntary family planning priority and are accessible to all people, including adolescents.

- Investing in women and girls. Governments must take the political and financial commitments, education, health and labor needed to promote gender equality and empower women and girls.

- Invest in education. Governments must invest in access to free and quality education at all levels to prepare young people, especially girls, to participate fully in the formal labor market.

- Investing in economic policies. Governments should prioritize policies that create jobs and decent work opportunities for young people, especially girls.

  - Investing in good governance and fiscal policies. Governments should prioritize reforms, such as transparency and fight against corruption, which encourage individual and attract foreign investment savings.

Create an enabling policy environment

Anticipating the expected ageing of the population

If a country is facing the problem of aging in developing programs or public transfers by family breakdown, the increase in assets is reduced and the second dividend decreases. However, if workers are encouraged to save and accumulate money for their retirement, aging may increase the capital per worker, the productivity growth and per capita income. Thus, leaders should focus on building strong financial systems, enjoying the confidence of the public and accessible to millions of people who want to secure their financial future. Today is the time for action, this time can not be delayed. People should have the opportunity and access to mechanisms for accumulating wealth needed to aging.

Conclusion

The economic policy recommendations will be generally directed to the advantage of the demographic dividend and a special way of controlling the life cycle deficit, the increase in net assets and the valuation of net transfers in financing productive investments.

Senegal needs to answer the existing demand of families for birth spacing and control, stimulate the creation of new jobs, attract capitals, develop and train the local labor force, and empower women by giving them more rights. In addition, Senegal is facing the immediate pressure of a large and growing population of productive working age, for whom a system to support their self-financing is yet to be established. Senegal is at a critical crossroad. Decisions need to be taken to accelerate the a sustained decline of fertility rates and to implement health, economic, nutrition, labor and fiscal reforms that will trigger economic growth in a context of demographic change.

- Profit of the demographic dividend

The Senegal has a first demographic dividend increased until 2030 for which it necessary to establish a set of measures to benefit which include:

• The creation of a massive and sustained investment in education and health;

• The promotion of family planning and the prevention of early marriages;

• Job creation.

- Increase in net assets and valuation of net transfers

The current rate of transfers is not sustainable. It is important to generate more jobs to increase the contribution of people who can finance life cycle deficit. Then, the following measures are necessary:

• Increased involvement of migrants in the financing of the economy by issuing diaspora bonds as provided in the Sovereign Fund Strategic Investments (FONSIS) and carried out by some countries including Ethiopia and India;

• The promotion of the culture of savings to ensure its increase;

• The orientation of migrant transfers in productive investment to the detriment of consumption which swallowed up 80% through information and awareness of the niches and existing investment opportunities in the country.

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